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HUMANITARIAN RELIEF AND MARKET INTERESTS: GENETICALLY MODIFIED ORGANISMS IN THE UNITED STATES FOOD AID[1]

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Abstract: In 2002, Southern Africa was struck by a severe food crisis. Despite the hardships, some nations of this region refused food aid from the US due to the presence of Genetically Modified Organisms. They claimed that the food was unsafe for their population's consumption. The paper addresses the main reasons for the US donation of GMOs. Based on documental analysis, congressional hearings and literature review, we argue that although the donations may have the intention of helping the emergency problems of these African and Latin American countries, the food aid also promotes US market interests, disregarding public health conceptions and economic interests of those countries.

Keywords: Food Aid; Genetically Modified Organisms; Food Crisis.

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I. Introduction

Food insecurity results from critical circumstances in which people do not have access to enough food portions that would allow them to maintain normal health conditions. The persistence of food insecurity in the 21st century is an outrageous phenomenon because there are material means to ensure that everyone can eat decently. In fact, the number of undernourished people in the world felt from 945 million to 820 million between 2005 and 2017. However, the latest number is striking, especially in face of the fact that the undernourished population has actually grown in the last three years. In 2014, 783.7 million people went hungry (FAO, 2018). International food aid is a palliative alternative to this problem. This kind of intervention alone does not envisage an upgrade in the structural conditions that cause the scourge, but looks (i) for an improvement of the critical and emergency situations created by different factors such as natural disasters or military conflicts; or (ii) to minimize the social effects of unsuccessful economic and political structures. Given the importance of international food aid, we set up a discussion that deals with a specific and delicate issue: the donation of genetically modified foods. Although such food is permitted and consumed in large scale in countries such as Brazil and the United States, there are countries that prohibit its production and commercialization.

This article discusses food aid containing genetically modified organisms (GMOs) through some controversial cases involving the United States - the world's largest food donor since World War II. The US has donated genetically modified food to some African and Latin American countries in this century, but some of these countries have refused to receive it for different reasons. However, it was surprising that some of the donated GM foods were not allowed for consumption in the US. The US has gone through a public debate on this issue, which has produced official documents and statements that are analyzed here.

The argument is organized as follows: In the first section we present general elements and some cases related to debates on the use of GMOs in international food aid packages. We highlight the open disputes between governments that have different conceptions about the safety of this type of food. In the second section we look at the broader political e economic debates regarding the production and marketing of GMOs. The third section presents the US strategic and economic reasons for the global spread (including through International Food Aid) of its genetically modified food agriculture production. In the last section we deal with the US attempt to create international norms and rules that ensure the global spread of this type of

organisms. Finally, it can be understood that the US food aid policy carries strategic elements for the acceptance and international regulation of genetically modified foods.

II. GMO as Food Aid

Defining food aid is more complex than it seems. Fundamentally, it can be considered as the distribution of food to population in need. However, such distribution can occur in a variety of ways, even indirectly. We make use of the World Food Programme´s (WFP) 2012 definition for 'Emergency Food Aid' as an action that "is provided on a short-term basis for victims of natural disasters or political instability. It is freely distributed, and is usually provided on a grant basis. It may be channeled bilaterally, multilaterally or through NGOs". An important variation regarding food aid provision, one that is of greatest interest to this article, is the specificity of the modalities called tied food aid and untied food aid. The first indicates that the donating country must buy/acquire the food to be donated (or at least a part of it) from their local producers. That is, the aid is tied to the donor´s national market. On the other hand, in the untied model the donor has no obligation to buy/acquire the food in its own domestic market (Barrett, 1998; Clay and Riley, 2005).

In this article, we propose a debate on a specific kind of food aid, which strikes us as relevant and worthy of thorough evaluation: the food aid containing GMOs. The issue is important from many points of view. From the human rights´ point of view, it should be pondered whether the donations are safe to human health even considering extreme crisis situations; and, if so, if it would be appropriate to reject it in order to protect commercial interests. From the standpoint of the International Relations, it should be questioned if the donations have an underlying interest that is not a humanitarian one or if it has anything humanitarian at all. According to Jennifer Clapp (2012), the debate around food aid has intensified in the last years. The main reasons behind it are related to the introduction of GM food in the US aid packages and some critical commercial disputes that have also been associated to this.

The first case of GM food donation involved Southern African countries, and indirectly the European Union, Argentina and Canada (Zerbe, 2004). Southern Africa was on the verge of a serious food crisis in 2002 that resulted from a complex combination of factors including climate change, the proliferation of the HIV virus and governance aspects. In the same year, the countries of that region unexpectedly hurdled the reception of food aid. Some of them only

accepted milled maize kernels in a maneuver to avoid them being used as seeds. Such was the case of Angola, which changed its legislation to receive food under these terms as late as 2004. Zambia adopted a more radical approach by rejecting all US´ and Canada´s donations because the packages intended for the region contained transgenic maize. The African countries' main arguments to justify the rejection were based on three factors: (i) the effects of transgenic food in undernourished or fragilized (by diseases such as AIDS) organisms are unknown; (ii) such food, when used as seeds, can contaminate local production, thus jeopardizing exports to the EU, which does not authorize GMOs to be commercialized and which is the main international market for those Southern African countries; (iii) the possibility of harmful effects to the environment. All those issues led to a wide debate around biotechnology and its application in agriculture as well as nourishment (Zerbe, 2004; Tahri, 2005; Clapp, 2012).

The United Nations published the UN Statement Regarding the Use of GM Foods as Food Aid in Southern Africa in response to the controversy generated by African countries' refusal to receive food aid containing GMOs, asserting that it is a sovereign decision to receive or not such food. It also asserted that genetically modified food poses no risk to human health and that it is the responsibility of the donor to ensure food safety in any case. Even though some countries refused GM food aid claiming distrust over its safety to human and animal health as well as to the environment. The controversies around other US donations were more harshly and clearly polemic. They were the cases involving the donation of food that are considered inappropriate for human consumption in the US, such as the *StarLink* maize and the *LibertyLink* rice (Taylor e Tick, 2001 and Bhattacharjee, 2009)[5].

These products were found to be unhealth or harmful for other purposes due to the risk of contamination. Even so, they were included in packages sent by USAID, the World Food Program and other agencies to underdeveloped countries such as Bolivia, Ecuador, Guatemala, Nicaragua, Cameroon, Burkina Faso and Sierra Leone from 2002 to 2005 (FOE Africa, 2006;

[5] Michael R. Taylor and Jody S. Tick (2001) explain that Starlink is the name given to genetically modified maize that allows it become resistant to certain types of insects upon the insertion of the Bt toxin and of the Cry9C protein in its gene. However, in 1998, the United States Environmental Protection Agency authorized Starlink for animal consumption or other purposes only. This was based on the finding that the Cry9C protein and Bt toxin can cause allergies in humans. According to Bhattacharjee (2009), the Liberty Link (LLRICE601) is a rice variation that was genetically modified by the German agribusiness company Bayer CropScience. The latter allows the plant to become resistant to the herbicide glufosinate ammonium, also produced by Bayer. This way, once the herbicide was applied it would not be able to kill the rice plantation. Bayer decided not to commercialize Liberty Link and therefore, it did not submit it for approval of the FDA and the United States Department of Agriculture (USDA). After crop contamination was found in American foods, however, the company decided to submit this variety of GMO for approval. Nonetheless, Clapp (2012) points out that the commercialization of LL601 was prohibited in the US and was abandoned by Bayer in 2001. The main companies involved in the commercialization of Starlink and Liberty Link are: Aventis, Pioneer, Monsanto and Bayer.

Associated Press, 2005; FOE, 2004). Regarding the *LibertyLink* rice, the fact that the US legalized it for domestic consumption only days after having the variety been found in Sierra Leone is curious to say the least. This resulted in the resentment shared by various actors of the international civil society (Clapp, 2012).

In the following section, we outline some of the controversies developed around transgenic foods.

III. The Genetically Modified Foods and some of its controversies

Genetically modified foods are just another chapter of the technological revolutions of agricultural production. The production, commerce and consumption of transgenic foods are polemic since the 1990s, when it received approval for cultivation in the US As a result of the mentioned cases, food aid containing GMOs gained in the years 2000 a specific part of this debate, tackling issues such as international solidarity, human rights, foreign policy and economic interests.

For the purposes of this article, it is worth mentioning that genetically modified foods are the pivot to at least three controversies. The first and most obvious one relates to the harmful characteristics of some varieties, like the *StarLink* maize, which is prejudicial to health. The second one is a little subtler and concerns potential risks to health. The third controversy is related to economic losses in the countries who receive transgenic food aids.

Researchers have appointed that many of the GM foods can be prejudicial to human and animal consumption, given the lack of sufficient tests that confirm its safety, especially regarding long term risks. Caution should therefore point to avoiding such foods. First generation crops have antibiotic resistant genes, which can be transferred to bacteria that have humans as a host, turning humans equally resistant to various drugs. Regarding agricultural production, the GM foods that are more resistant to pests can end up stimulating the emergence of super-pests, toughening pest control mechanisms (Cavalli, 2001; Nodari e Guerra, 2003; Murphy e Yanacopulos, 2005; Camara et. al., 2009).

The apprehension around possible harmful effects of GM foods are easily noted in the negotiations of the Cartagena Protocol on Biosafety[6], signed in 2000 and operative since 2003.

[6] To Borges et al (2006), the Cartagena Protocol on Biosafety began negotiations in the Convention on Biological Diversity (CBD). Even though the agreement was established since 2000, it was only in 2003 that the Cartagena Protocol on Biosafety had the force of law. In the same year, it was also approved by the Brazilian Congress. The agreement had as aim protect biological diversity, given the innovations in modern biotechnology, especially with

The protocol adopted the 'precautionary principle' and the 'labelling obligations for LMOs (Living Modified Organisms) highlighting the gene involved' (Nodari e Guerra, 2003; Morgan and Goh, 2004). It is important to mention that the US adhere to the "principle of substantial equivalence" instead of the precautionary principle and is not part of the Cartagena Protocol, which currently holds 170 members[7]. This helps us to explain the fact that the US aid to Southern African Countries in the beginning of the 2000s does not follow the protocol principles. And it is also highly relevant given the fact that the US is the main supplier of international food aids.

The principle of substantial equivalence demands significant similarities between transgenic organisms and natural ones in order to assure that the GMO be at least as safe as the crops resulted from the conventional farming (Acosta and Chaparro, 2008). According to this principle, the foods that are tested and show aspects that are similar to natural foods in "color, texture, oil content, composition and content of amino acids" are considered equivalent (Nodari and Guerra, 2003; p. 112). It should be emphasized that the foods that fit into the substantial equivalence are free from the obligation of specific labelling. Scientists of several countries criticize the concept because of its commercial focus and inaccurate tests. In general, they say it would not be possible to prove that a genetically modified food is safe through tests that compare physical and visual aspects alone. The precautionary principle, in turn, means GM foods should be refused until scientific proof supporting their safety can be offered. It is in this scenario that the debate between the US and EU regarding production, commerce and consumption of GM foods arise within the WTO reverberating on food aids (Morgan e Goh, 2004; Murphy e Yanacopulosh, 2005; Clapp, 2012) [8].

The third controversy is economic losses that could arise upon GM food aid. There are some important criticism covering the loss of biodiversity due to the usage of genetically modified seeds as well as the decrease of famers' economic autonomy. Transgenic seeds require high level of standardizing procedures and are more resistant to diseases, pests and

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regard to the commercial regulation of Genetically Modified Organisms (GMOs) – or as Borges et al prefers to address it: modified living organisms. It is considered to be the first international agreement for the regulation of GMO commerce, manipulation and utilization.

[7] Updated member list available at: http://bch.cbd.int/protocol/parties/, Accessed in 17/05/2015.

[8] The EU calls on the precautionary principle within the WTO in order to restrict US imports ever since 1998. On the other hand, the US (the greatest GMO producer) have used the substantial equivalence principle together with Argentina and Canada and have formally positioned against the EU in the WTO in 2003. The argument used by the US is that the EU violates WTO principles that envisage free commerce when they block the GMOs. Furthermore, the attitude adopted by the EU would be gravely affecting US exports as well as influencing the acceptance of their GMO products in the international market, thus, leading to elevated losses. (Zerbe, 2004; Clapp, 2005; Clapp, 2012).

adverse climate. They may also be more productive than the natural ones. However, the substitution of more conventional seeds for the genetically modified ones may end up decreasing, even eliminating, the multiplicity of existing natural varieties and the economic viability of many of them. Also, transgenic seeds have (purposefully or not) less reproduction capacity and some are even sterile. In this case, with each new harvest, producers must buy new seeds, thus becoming dependent on a rather concentrated number of companies of the sector (Martins, 2010).

As pointed out by some important analysts, the interests of the agribusiness companies prevail over public health and the environment, even with all the questions and doubts regarding transgenic foods and the unfavorable recommendations to its commercialization (Nodari and Guerra, 2003; Tansey, Rajotte, 2008; Camara et al., 2009; Clapp, 2012).

The enlargement and strengthening of the Intellectual Property (IP) rights internationally is a critical element of this debate, leading to the possibility of the private protection of living organisms, such as genetically modified plants and animals (see Tansey, Rajotte, 2008; Martins, 2010). The proliferation of GMOs and IP rules, fueled to a large extent by the demand for new international agreements by the US, few companies have concentrated more control over seed production and distribution. This monopolistic control over more effective varieties affects traditional forms of food production, threatening control over future food possibilities. The patenting of technological innovations in the agricultural sector can affect traditional farmers when they do not have enough financial resources to pay for the license. They would still face difficulties gaining access to more fertile seeds and technological production tools, thus becoming less competitive. Recent internationally negotiated IP rules lead to profound changes in the legislation of GM recipient countries, including the mandatory patenting of plant varieties (which is not mandatory by the TRIPS agreement). This is an important change because it limits the flexibilities that farmers, especially the small farmers, have in the use, storage and distribution of traditional seeds. Moreover, the protection of GMOs through patents or similar instruments also tends to create large monopolizing corporations due to the concentration of power in patent holders. It can be said that, because the US is a pioneer in biotechnology agriculture, and allied to the defense of IP protection, the US become more powerful and hegemonic in the field of food technology with the spread of GMOs (Tansey, Rajotte, 2008).

Those who are contrary to the production of GMOs fear that transnational companies are more interested in increasing profit than protecting the environment or eradicating hunger[9]. Moreover, there is a lack of confidence on GMOs´ regulating institutions, given the possibility that the transgenic organisms not only infiltrate wild ecosystems causing devastating effects over biodiversity but also lead to unfair competition with other agricultural systems (such as the agroecological).

The GMO debate also divides the American society. As presented by the Global Legal Research Center (2014: 209) from the Law Library of Congress, research on public opinion conducted between 2001 and 2006 shows that "support for the introduction of genetically modified foods into the food supply held steady at 26 to 27% of respondents in favor over that time period, while opposition to the introduction of such foods fell from 58 to 46% over the period".

The opinion of the academic and scientific community is also divided. In general, they fall in this manner: (i) scientific research linked institutions (like National Research Council, American Association for the Advancement of Science, American Medical Association) are amongst the supporters; and (ii) Environmentalist institutions, organic producers and consumers (for example: Greenpeace, Organic Seed Growers and Trade Association, Center for Food Safety) are against it.

IV. US Motives

Amid heated discussions involving GMOs, it is inevitable to question US interests in offering genetically modified foods. Corroborating some important analysis, it seems that the US interests in stimulating GM food aids are primarily economic (Zerbe, 2004; Tansey, Rajotte, 2008; Clapp, 2012). Currently, the U.S is the biggest genetically modified food producer of the world, for which 73,1 million hectares[10] are destined. As the domestic market is unable to absorb this volume, thus exports become imperative. Traditionally, US food aid has also been an alternative to reducing the domestic offer of grains in the US and it seems to be no different for the transgenic grains (Burbach e Flynn, 1980; Portillo, 1987; Ruttan, 1993; Lima e Dias, 2016). For instance, Diven (2006) shows that the donations are based on

[9] Paarlberg (2010), Acosta and Chaparro (2008) argue in a different direction. They defend the use of transgenic foods as a solution to the world food crisis. According to them, advancements in genetic interventions would be important to prepare agriculture to future global challenges, such as populational growth and climate change.
[10] Source: Clive James, 2014.

exceeding commodities (unable to be taken in by the domestic market) rather than related to the deficiencies of grain production in the recipient countries. She concluded that such aid has low humanitarian purpose and great commercial motives – that is, to ease negative export variations of US foods (Diven, 2006).

The creation of foreign markets for GMO is also a strategic goal. Thus, the more countries allowed GMO farming, consumption and commerce, the biggest would the global market for US farmers be. That is, GM food aid could be an alternative to introducing it indirectly in some countries, leading to their legalization and creating of productive, commercial and technological opportunities. Moreover, this could impact international regimes, such as the intellectual property one. The more disseminated and wider the practice of GMOs amongst states, the greater the support (or the less the resistance) to stronger standards of IP. The reverse would also be true. As more countries become signatories to IP agreements that provide patent seed protection, they are more vulnerable to the market pressures of companies that demand the marketing of GMOs.

Different sources and studies tend to argue that economic interests prevail in the planning and executing US aid. Diven (2006) and Clapp (2012) conclude that the political relations between interest groups, legislators and Executive actors lead to a more commercial than humanitarian agenda in US aid policy. Thus, although actors worried about solidarity are not excluded, priority is given to meeting private and electoral interests, leaving the humanitarian slogan behind. In the same sense, Friends of the Earth (FOE) also points out that economic interests direct the actions of the US towards GM food donations. The 2015 FOE Report considers that US crops containing GMOs have been hindered through laws and regulations worldwide. Furthermore, genetic engineering technology has been rejected by consumers in some regions. The US then began to defend actions against regulations that restrict the use of transgenic crops. In order to do so, they used long term assistance strategies to implement nationwide structures of biosafety in developing countries (FOE, 2015).

Cornish (2018) and the NGO Sustainable Pulse (2016) draw attention to the fact that the Bill & Melinda Gates Foundation works in partnership with USAID, the UK Department for International Development and the Japan International Cooperation Agency to disseminate GMOs in developing countries. This dissemination occurs through investments in biotechnology, mainly in African countries, under the argument of reducing food insecurity, use of chemicals, and plant vulnerability during droughts, and other arguments.

USAID´s operations (influenced by the agribusiness) together with organizations such as the Bill and Melinda Gates Foundation and Monsanto carry the US strategy to promote

GMOs through projects such as the ABSP (The Agricultural Biotechnology Assistance Program) and the PBS (Program for Biosafety Systems). Both projects have the aim of implementing policies that favor the US in biosafety, food safety, IP laws and technology transfer in Africa and Asia. Together the budget of these programs is approximately 28 million dollars (FOE, 2015).

The USAID argues of fighting hunger in the African continent by farming transgenic plants. However, what has been noted is that even after 14 years of experience in the African continent with GMO production, food safety was not assured. On the contrary, the differences between the rich and the poor in the continent grew. According to the FOE's (2015) report, the African Model Law on Biosafety is an answer (i) to attempt to protect African countries who suffer the negative effects of GMOs as well (ii) to inhibit the expansion of the agribusiness and the IP laws that can be benefit big corporations with the aid of USAID.

However, after 60 years of consistent food aid, the US has been trying to adopt a new attitude as a result of the criticism, controversies and political strengthening of groups linked with human rights (Clapp, 2013; 2014). The Bush and Obama governments sought to implement policies of untied donations as a means to reduce the costs with food aid, enhance the *soft power* and show a greater humanitarian concern, but protectionist forces end up severely limiting the possibilities of a reform (Diven, 2006; Lima and Dias, 2016). Theoretically, it is harder to create packs with natural food (supposing this were an aim[11]) when having to collect it from the national market, which is saturated with GM commodities. However, Zerbe (2004) points out that significant stocks of non-GM food were available, despite the government's assertions to the contrary. The problem was USAID's reluctance to engage in discussions on GMOs, and to seek alternatives to tied food aid.

The US arguments for GM food aid should be noted. When pronouncing about the controversies in Southern Africa during the 2002 crisis, the US adopted as its strongest argument the fact that their own citizens eat this type of food[12]. Aside from that, they give emphasis to the scientific argument pro-GM foods, that transgenic crops would become a tool

[11] However, Zerbe (2004) argues that the US policy on the insertion of transgenic food aid for Southern Africa showed various failures. First, significant non-GM food stocks for food aids were available, despite the US government state otherwise. Having said that, the author argues that the decision of the US government for distributing GM foods in Southern Africa was far from the lack of alternatives to GMO introduction. Actually, it was much closer to the fact that USAID was reluctant to take part in any issue regarding GMO safety and convenience in the region; as well as (ii) to find alternatives that did not include tied food aid.

[12] The argument must be taken with caution as there are different varieties of transgenic. Each of them must be tested and approved after it has been invented. In this case, a transgenic variety consumed by the north Americans may not be the same as the one present in the food donated in food aid packs (Halewood e Nnadozie, 2008).

against hunger in the future and this is a kind of food that can (i) be manipulated in a such way as to contain greater nutrient contents and (ii) be programmed to be more resistant to pests and viruses (Zerbe, 2004; Halewood and Nnadozie, 2008). An extract of the ISAAA (2014) report exemplifies it:

> Provisional data for 1996 to 2013 showed that biotech crops contributed to Food Security, Sustainability and Climate Change by: increasing crop production valued at US$133.3 billion; providing a better environment, by saving ~500 million kg a.i. of pesticides in 1996-2012; in 2013 alone reducing CO2 emissions by 28 billion kg, equivalent to taking 12.4 million cars off the road for one year; conserving biodiversity in the period 1996-2013 by saving 132 million hectares of land; and helped alleviate poverty by helping 16.5 million small farmers, and their families totaling >65 million people, who are some of the poorest people in the world. Biotech crops can contribute to a "sustainable intensification" strategy favored by many science academies worldwide, which allows productivity/production to be increased only on the current 1.5 billion hectares of global crop land, thereby saving forests and biodiversity. Biotech crops are essential but are not a panacea and adherence to good farming practices, such as rotations and resistance management, are a must for biotech crops as they are for conventional crops (ISAAA, 2014).

Nevertheless, it is important to highlight that there are controversies in the data spread by ISAAA. According to FOE report (2015), ISAAA can be considered as the most powerful tool created by the US, in collaboration with USAID and the private sector, to promote GMO acceptance around the world and reporting its safeness. FOE frequently analyzes the data made available by ISAAA and report some important errors regarding the number of GM crops available worldwide – among the errors are a double counting of crops that have more than one engineering trait in them; and the number of planted hectares in a given country. Even so, the success of GMOs is accepted and disseminated in the academy and the media.

The Washington Foreign Press Center conducted a research in which journalists of Southern Africa could analyze the agricultural biotechnology policy of the US after the transgenic incident in Africa with the objective of confirming the safety of GMOs. At the end of the research, the reports indicated that African journalists were certain of the innocuity regarding GMOs and that they were enthusiastic about the possibility of biotechnology bringing development to the African continent. Similarly, USAID and the Zambia National Farmers Union (ZNFU) planned the operation of biotechnology in Zambia. Having understood the risks to the environment and biodiversity, USAID and UNAZ carried out the Zambia Trade and Investment Enhancement Project (ZAMTIE) in June of 2002, amid the African crisis in order to recommend strategies that promote the economic and commercial development of Zambia through biotechnology (Gregory e Simwanda, 2002). However, ZAMBITE

demonstrates that the advantages of biotechnology is one of America´s main argument for its dissemination as well as that of the possibility of using it as one of the tools USAID employed for opening the market to North-American biotechnology.

V. The dissemination of GMOs through international regimes

The emergence of developers of new plant varieties has led to the creation of a large seed market, which in turn has come to require private protection of these new products. The protection of new plant varieties originates from US legislation and has been internationalized with the approval of the UPOV Agreement[13] in 1961. Under the agreement, countries should grant protection to new plant varieties that meet minimum requirements[14] (PVP) and which result from improvements by traditional methods, such as asexual reproduction, or by methods that use genetic engineering such as transgenics.

The approval of TRIPS in 1995 also brought countries under obligation to grant private protection to new plant varieties, but allowed countries to exclude them from the obligation to grant patents[15]. Thus, TRIPS did not require the granting of patents for plant varieties, but established the need for private protection to developers. However, the agreement did not establish exactly which protection model countries should adopt. The UPOV system was generally preferred by countries to adapt their national systems to the new multilateral rules (Yamamura, 2006; Brahmi, Chaudhary, 2011).

A fundamental aspect of the system to protect new plant varieties is the balance between the rights of the developers and users. This balance is manifested in so-called farmers' privilege and breeders' exemption. The first specifies that farmers have the right to store, replant and exchange protected propagating material (flowers, fruits and seeds), while Breeders' exemption establishes the right of access and use of protected varieties for research and development purposes (without the need of authorization of the right holder), even for the development of new varieties. These two flexibilities, clearly established in the UPOV agreement of 1978, allow the sustainability of small production, while authorizing research for the continuous improvement of new varieties (Correa, 2017). Many developing countries, including Brazil,

[13] UPOV is an intergovernmental organization based in Geneva established in 1961 and revised by agreements in 1972, 1978 and 1991.
[14] In general, for the granting of a security title, the new plant variety must be new to the market, distinct, uniform and stable (Dutfield, 2011)
[15] Article 27 stipulates the obligation to protect "plant varieties, either by means of patents, by means of an effective sui generis system or by a combination of both."

have adopted this regime. However, the 1991 UPOV version severely limited these two exceptions. As far as Farmer's privilege is concerned, it limits it by extending the rights of inventors to virtually all acts relating to the production and reproduction of plant varieties: storage, replanting and exchange would be allowed for royalties while breeders' exemption was limited to the fact that the use of protected varieties for research purposes was considered illegal without the consent of the holder.

The US, in its free trade agreements, makes it compulsory for its trading partners to grant patents for living beings, including new plant varieties, or to sign the 1991 version of UPOV, which approximates to the patent protection system (this confers the most absolute rights on the holders). Thus, the US has been seeking a proliferation of plant variety protection systems that are consistent with the monopoly interests of its seed companies and GMO development.

Bearing these considerations over the progress of IP for the protection of living organisms and plant varieties in mind, it is possible to question the commercial effects of the inclusion of GM foods in US food aid packs. Two cases offer interesting information.

One of the most polemic cases regarding the protection of innovations related to plant varieties involved Monsanto and a Canadian farmer, Percy Schmeiser. According to Ziff (2005), Schmeiser would have practiced patent violation by farming Roundup Ready canola seeds from Monsanto without authorization. In 2001, the corporation sued the farmer for using company patented seeds. Schmeiser affirms that he did not acquire any kind of biotechnology from Monsanto and that the GM plants might have been a result of crossed reproduction contamination. The seeds could have fallen on his lands carried by the wind, animals or insects. As the patent in question was granted to the gene and not the plant, the farmer could even have a different plant in his farm, but if the gene-protected seeds somehow ended up in his land, this gene could be present in any given plant that came into contact with it, automatically protecting the plant itself. Canada´s Supreme Court decided in favor of Monsanto, arguing that the plants' patent was valid and that the farmer would have broken the protection granted to Monsanto (Kimbrell e Mendelson 2005; Schubert, 2005; Ziff, 20105; Heuer, Wolf and Berry, 2008).

Many are the cases like that of Schmeiser (Kimbrell e Mendelson, 2005; Schubert, 2005). In the 2005's Center for Food Safety report entitled "Monsanto vs US Farmers", Kimbrell and Mendelson (2005) show that the corporation has been taking advantage of its IP rights over GM seeds to judicially persecute farmers that may use these seeds without permission. However, most these farmers complain that their crops have been involuntarily contaminated with GM material from Monsanto. The farmer from North Dakota, Tom Wiley, blows away

and mentions that “farmers are been sued for having GMOs in their property that they did not buy, don´t want and can´t sell” (Wiley apud Kimbrell e Mendelson, 2005).

Kimbrell e Mendelson (2005) refer to two other similar cases of farmers who have been disadvantaged by the multinational in the US: the Hartkamp case and Thomason family. In the first case, Hartkamp was sued by Monsanto in 2000 for having used Roudup Ready in his plantation without authorization, even if the use has been unconsciously done. The farmer ended up losing millions of dollars in the process and had to sell his property for a price below that of when he bought it. The Thomason family was also sued by Monsanto for unaware use of the patented GM Bt cotton. The tradesman who sold the seeds did not alert Thomason that the seeds were patented, nor did he ask for a technology contract of any kind to be signed. After the family was sued, they had to pay over one million dollars to Monsanto for farming 4.000 hectares of Bt cotton, even in the chance of his lands having been unconsciously contaminated. Bankruptcy is what follows for many farmers as a result of the costs involved in the lawsuit and compensation that they are obligated to pay the corporation for utilizing patented GM seeds (Kimbrell and Mendelson, 2005).

This hugely affected small producers or even big ones and may continue to do so, as these seeds can be disseminated around the world, granting Monsanto the right to sue any plantation that were contaminated with their patented genes. In a similar manner, food aid could also be affected as small agricultural farmers who receive food aid seeds are restricted to using them. Moreover, there is a risk for crops if they are involuntarily contaminated with GM seeds. In Southern African countries, this could lead to producers having to answer to lawsuits under the country´s legislation. Although, even if that were not to happen, there would still be a serious consequence to face: losing the European market.

VI. Final Remarks

The analysis of the food aids containing GMOs donated by the US identified underlying economic interests of major US productive sectors, especially biotechnology and fine chemical. Both the exportation of surplus products as well as the opening of markets seem to constitute the critical motives for the inclusion of GMOs in the food aid packs, even if those foods are not allowed in the recipient countries. Opening the international market for these products is a task that faces two overlapping barriers: public health concerns and international trade rules. As presented throughout the article, there are still important doubts about the effects

of GMOs on the food market, consumer health and the environment. On one hand there is the precautionary principle set by the EU in the WTO, which vetoes GM food imports due to the lack of concluding research results assuring they are safe for consumption. This is the same argument put forth by Southern African countries who have rejected such donations. On the other hand, there is the commercial interest. In the specific case of those Southern African countries, besides public health considerations, caution was taken to ensure they did not lose the EU importing market. Thus, if the US emergency GMO-food aid intended to help Southern African countries during food crises, they were also linked to political and economic objectives which disregarded the receiving countries' commercial and public health interests.

Finally, the study of the US experience may be useful to reflect about the Brazilian international food aid, as the largest part of it is usually composed of maize and rice produced by the large-scale agribusiness with GMO seeds and techniques.

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