International Journal of Research in Social Sciences
Vol. 7 Issue 9, September 2017,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

THE GEOPOLITICS OF AGRO-ECOLOGICAL CRISIS: A CASE STUDY OF MOZAMBIQUE

Introduction:

After the 2007-2008 global food crises, one of the significant question emerged in global scenario, who will feed the world? (Sommerville *et al.* 2014). Afterward, two agro food approaches came in front of world; first one is agro-ecological farming method and second one agro-biotechnology method. Agroecology has been defined as the "application of ecological science to study, design and management of sustainable agroecosystems" (Alteri 1995 and Gliessman 2007). It seeks to improve agricultural system by augmenting natural processes, thus enhancing beneficial biological interaction and synergies among the components of agrobiodiversity. Common principles of agroecology include recycling nutrients and energy on farms, rather than augmenting nutrients with external inputs, integrating crops and livestock. Agroeocolgy is highly knowledge intensive, based on techniques that are not delivered top down but developed on the basis of farmer knowledge and experimentations (Schutter 2012). Its proponents advocates the importance of agroecology, they said, Modern industrial agricultural methods can no longer feed the world, due to the impacts of overlapping environmental and ecological crises linked to land, water, and resource availability (Ahmad 2014). Biotechnology has been applied as one of the eco-techno-political technologies in the 21st century. Of the many biotechnology options available for testing or implementing, perhaps the one that receives the most attention is genetic engineering (GE) for the production of genetically modified organism (GMOs), plant, animal and microbes. As currently applied, GE has come to symbolize agricultural production systems that make intense use of external inputs and promote mono-culture (Ferre 2008).

The present debate over the nature of biotechnology and genetic modification of basic food such as maize or soybeans misses the most essential point. The conversion of world agriculture by a small elite of biotech companies, most US-based, has little to do with corporate greed. It has very much to do with geopolitics and plans of some people to control world population growth over the coming decades (Engdhal 2007).

The nature of American power projection in the world today rests on the development of key strategic advantages which no other combination of nations can challenge, what the Pentagon planners' term, "full spectrum dominance." This includes global military dominance. It includes dominance of the world's limited, and rapidly depleting petroleum supplies. It includes control of the world's reserve currency, the dollar. And today it most definitely includes future control of world agriculture through control of GM patents and GM crops (Engdahl 2007).

Meat consumption and production are directly interlinked with global climate change and agro-ecological crisis. According to United Nations Food and Agriculture Organization (FAO), our diets and, specifically, the meat in them cause more greenhouse gases carbon dioxide (CO2), methane, nitrous oxide, and the like to spew into the atmosphere than either transportation or industry (Fiala 2009).

Geopolitics of Genetically Modified Food:

Genetic engineering emerged in the 1960s as a revolutionary innovation in biotechnology that some observers expected radically to transform industry and agriculture. As soon as the first genetically modified organisms (GMOs) were field tested during the 1980s and commercialized in the 1990s, however, genetic engineering became engulfed in a global controversy. Its use in food production particularly has provoked highly polarized reaction among producers, consumers, scientists and environmentalists worldwide. While some view it as an essentially beneficial technology that can increase agriculture productivity and help in the fight against malnutrition and poverty, others see it is as potentially harmful to humans and environment (Falkner 2007).

Over the last decade, the genetically modified (GM) food controversy has become a truly geopolitical phenomenon. The fact is that GMO technology would be owned and controlled by certain very powerful interests. In their hands, this technology is first and foremost an instrument of corporate power, a tool to ensure profit. Beyond that, it is intended to serve US global geopolitical interests. Indeed, agriculture has for a long time been central to US foreign policy (Todhunter 2015).

"*American foreign policy has almost always been based on agricultural exports, not on industrial exports as people might think. It's by agriculture and control of the food supply that American diplomacy has been able to control most of the Third World. The World Bank's geopolitical lending strategy has been to turn countries into food deficit areas by convincing them to grow cash crops – plantation export crops – not to feed themselves with their own food crops" (Hudson, 1972).*

The Project for a New American Century (PNAC)[1] and the Wolfowitz Doctrine[2] (1992) show that US foreign policy is about power, control and ensuring global supremacy at any cost. Part of the plan for attaining world domination rests on the US controlling agriculture and hijacking food sovereignty and nation's food security (Todhunter 2015).

GM crops are patented, which allows a few multinational companies such as Monsanto, Bayer, Syngenta, DuPont and Dow to control the entire GM food chain - from research to breeding to commercialization of seeds. The multinational companies that patent and produce GMO seeds control the majority of the seed market and often also produce herbicides and fertilizers. Patenting genetic material has shifted the balance of economic power towards big business in their aggressive pursuit of profit (Slow Food 2014).

Table 4: World's Top 10 Seed Companies, 2011

Company	% Market Share
1. Monsanto (USA)	26
2. DuPont Pioneer (USA)	18.2

[1] **T**he Project for the New American Century, or PNAC, is a Washington-based think tank created in 1997. Above all else, PNAC desires and demands one thing: The establishment of a global American empire to bend the will of all nations. They chafe at the idea that the United States, the last remaining superpower, does not do more by way of economic and military force to bring the rest of the world under the umbrella of a new socio-economic Pax Americana. (Pitt 2003)

[2] Doctrine outlined a policy of unilateralism and pre-emptive military action to suppress potential threats from other nations and prevent any other nation from rising to superpower status. (Rozeff 2014).

3. Syngenta (Switzerland)	9.2
4. Vilmorin (France)	4.8
5. Winfield (USA)	3.9
6. KWS (Germany)	3.6
7. Bayer Cropscience (Germany)	3.3
8. Sakata (Japan)	1.6
9. Takii & Company (Japan)	1.6
Total Top 10	**75.3**

Source: ETC Group, 2013

Table 5: World's Top 10 Agrochemical Companies, 2011

Company (Headquarter)	% Market Share
1. Syngenta (Switzerland)	23.1
2. Bayer CropScience (Germany)	17.1
3. BASF (Germany)	12.3
4. Dow AgroScience (USA)	9.6
5. Monsanto (USA)	7.4
6. Dupont (USA)	6.6
7. Makhteshim-Agan Industries (Israel)	6.1
8. Nufarm (Australia)	5.0
9. Sumitomo Chemical (Japan)	3.9
10. Arysta LifeScience (Japan)	3.4
Total Top 10	**94.5**

Source: ETC Group, 2013

Table 6: World's Top 10 Fertilizer Companies, 2011

Company (Headquarter)	% Market Share
1. Yara (Norway)	6.4
2. Agrium Inc. (Canada)	6.3
3. The Mosaic Company (USA)	6.2
4. PotashCorp (Canada)	5.4

5. CF Industries (USA)	3.8
6. Sinofert Holdings Ltd. (China)	3.6
7. K+S Group (Germany)	2.7
8. Israel Chemicals Ltd. (Israel)	2.4
9. Uralkali (Russia)	2.2
10. Bunge Ltd. (USA)	2.0
Total Top 10	41%

Source: ETC Group, 2013

The above table 1, 2 and 3 three shown, oligopoly of some of multinational Gene Giant, only Big Six (Syngenta, Bayer, BASF, Dow, Monsanto, DuPont) control 59.8% of seeds and 76.1% of agrochemicals and world top 10 firms control 41% of the global market. The same six companies have 76% of all private sectors R&D in these two sectors. All big six companies are based in USA and European countries. This is also responsible for geopolitical domination of global north.

From 1994 - 2010, seed prices in the United States shot up more than any other farm input, more than doubling relative to the price farmers received for their harvested crops. According to the USDA: "This increase was due, in part, to the increase in value-added characteristics developed by private seed and biotech companies" One industry analyst estimates that between 32% and 74% of the price of seed for maize, soybeans, cotton and sugar beets reflects technology fees or the cost of seed treatments. Between 1982 and 2007 the world's three largest seed firms accounted for nearly three quarters of all US patents issued for crop cultivars. In 2007, Monsanto's GE traits were in 85% of all the land area planted with GE crops in the 13 countries where they are grown. The Gene Giants accounted for 98% of all biotech acres. The Big Six devote, on average, at least 70% of their seed and crop R&D in pursuit of biotech and genetic engineering. They collectively spent $2.2 billion per year on average for crop breeding and biotechnology R&D from 2007 – 2010 (ETC Report 2013).

Notwithstanding a staggering level of corporate control over the world's commercial seed supply, the vast majority of the world's farmers – the peasant farmers who feed at least 70% of the world's population – are not tied to the corporate seed chain. Though the situation varies by crop and region, 80% - 90% of the seed planted by farmers in the global South comes from the "informal sector" – that is, farm-saved seeds (including seed exchange with neighboring farms and seed sales from local markets or seed fairs) (Jarvis *et al*. 2000). That means just 10% - 20% of seed requirements in developing countries is met by the "formal sector" that is, seed companies, government seed sources or other institutions. Recent studies confirm what farming communities already know: the formal seed sector does not have the capacity to supply the diversity needed in sustainable farming systems or to meet the need for locally adapted varieties, especially in the face of climate change (ETC Report 2013).

Engdahl (2005) traces how the oil-rich Rockefeller family translated its massive wealth into political clout and set out to capture agriculture in the US and then globally via the 'green revolution'. Along with its big-dam, water-intensive infrastructure requirements, this form of agriculture made farmers dependent on corporate-controlled petroproducts and entrapped them and nations into dollar dependency and debt. GMOs represent more of the same due to the patenting and the increasing monopolization of seeds by a handful of mainly US companies, such as Monsanto, DuPont and Bayer (Todhunter 2015).

After refusal of GM crop by several countries of Africa, then GM giant has chosen different route to inter in African agro-food sector. On the name of modernisation of agricultural in southern countries via philanthropist organisation is another way of GM multinational to full fill his economic interest and his countries geopolitical interest. As example we see AGRA and WEMA project in Africa.

The Alliance for a Green Revolution in Africa (AGRA) is a non-profit organisation established in 2006 by the Bill and Melinda Gates and Rockefeller foundations to modernise African agriculture. AGRA currently has offices in Kenya and Ghana and is setting up offices in Tanzania, Mozambique and Mali. In AGRA report (2013), "Almost as an aside, the report defends GM as a rigorously tested practice, citing industry and government bodies that share the modernisation paradigm as evidence (ACBio 2015: 63). It reduces public opposition to GM to "fear of the unknown" (ACBio 2015: 64). Although AGRA currently is not directly sponsoring work on GM, these comments indicate its in-principle support for the technology. The Gates

Foundation has significant investments in GM R&D as well as shares in Monsanto (ACBio 2015).

WEMA (Water Efficient Maize for Africa) project has been launched in Africa's five countries (Kenya, Tanzania, South Africa, Mozambique and Uganda) in 2008. WEMA is funded by Bill and Melinda Gates Foundation, the Howard G. Buffet Foundation and USAID. Its key partner includes Monsanto, the International Maize and Wheat Improvement Centre (CIMMYT) and the national agricultural research systems (NARS). In this project Monsanto provide GM seed of maize (African Centre for Biodiversity (ACBio), 2015). In 2015, Mozambique government has given approval of confined field trials (CFTs) and a more research-friendly regulatory framework. Mozambique's Ministry of Maize and Policy Breakthrough for WEMA said in his statement, *"In Mozambique, you cannot talk about food security without talking about maize"* (Okono 2015).

Mozambique's seed law prohibits the import and planting of GM seed. However, Mozambique accepts genetically modified (GM) food aid, including and especially from the United States. According to the United States Agency for International Development (USAID), the US government has allocated nearly $12.6 million in humanitarian assistance to Mozambique for 2006. USAID‘s Food for Progress (FFP) has provided 15.500 MT of P.L480 Title II emergency food assistance valued at %11.6 million to Mozambique through the World Food Programme (ACBio 2006).

ACBio pointed out that the opening or maintaining of markets is a key objective of USAID's Public Law 480 (PL 480). PL 480 clearly asserts that the purpose of US food aid programmes is to 'develop and expand export markets for United States agricultural commodities'. A position repeatedly pronounced by government officials: 'The opening of new markets is immensely important for the future of U.S. agriculture.' Moreover, US agribusiness such as Cargill and Arthur Daniel Midlands (ADM), which control US maize exports, have been the main beneficiaries of US food aid Programmes (ACB, 2006). Moreover, Washington US-AID food assistance for Africa in has been linked to willingness of a country to accept US GM crops. US assistance to combat AIDS in Africa has similar strings. GM has clearly become a strategic, geopolitical tool for Washington (Engdahl 2007).

The report, 'Future of seeds and food', published in 1999 by the international coalition of No Patents on Seeds, calls out for an end to patenting seeds, plants, and animals, and the need to stop the food monopoly created by Big Biotech. Africa has also been negatively impacted by GM crops. SeattleGlobalJustice.org recently reported that "in 2009, Monsanto's genetically modified maize failed to produce kernels and hundreds of farmers were devastated. According to Mariam Mayet, environmental attorney and director of the Africa Centre for Biosafety in Johannesburg, some farmers suffered up to an 80 percent crop failure" (Mercola 2010).

The GM debate started to impact on the international political process in 1990s. Little noticed efforts to create international rules on GMO safety had started in the mid-1990s and were expected to be completed in 1999, at a specially convened conference of the parties to the Convention on Biological Diversity (CBD). However failure to reach agreement at this meeting in cartagena, Columbia, projected the biosafety talks into the limelight of the global trade-environment conflict. The parties continued their search for a compromise and in January 2000 succedded in adopting Cartagena protocol on Biosafety. But despite the fact that this treaty entered into force in September 2003, divisions persist between those countries that demanded strict international biosafety rules and those countries that demanded strict international biosafety rules and those that feared that the biosafety treaty would impose unnessessary trade barriers and harm the growth prospects of the biotechnology sector (Falkner 2008).

Two fault lines have characterized the international GMOs conflict: one between North and South, and one between North America and Europe. Tension between developed and developing countries over the question of international biotechnology regulation go back to the1980s, when developing countries representatives for the first time argued for international safeguards, developing countries become the testing ground for what they perceived to be a largely untested Northern technology. At that time, most developed countries opposed these demands, arguing instead for voluntary safety guidelines. Nevertheless, developing countries and transnational activists continued to press Northern governments on the issue and were able to create an international talk on the Cartagena protocol, however, North-South tensions continued to dominate discussion on how to develop further the biosafety regime in area such as international liability (Falkner 2007).

Somewhere later, in the second half of the 1990s, transatlantic divisions bengan to emerge that were to play an important role in the international politics of GM food. Growing anti-GM sentiment in Europe forced a change in the European Union's (EU) policy on GMO authorization and led to a *de facto* moratorium in late 1998 on new GMO approvals and imports. This shift in European policy provoked the first major international trade conflict over GMO safety policies. The world's then leading GMO-producing countries- the United States, Canada and Argentina- threatened to bring a case against the EU under the World Trade Organisations's (WTO) dispute settlement procedure, thus raising the diplomatic stakes involved in the parallel efforts to reach an agreement on the biosafety treaty. When the WTO case was finally launched in 2003, the Cartagena Protocol had been agreed, but the GMO-exporting countries unmistakably signaled their intension to fight trade related measures that they felt violated trade rules. The WTO dispute panel found the EU in breach of WTO rules. Even if this ruling is confirmed after a possible appeal by the EU, it is likely to be a pyrrhic victory for the GMO-exporting countries. first, much of the resistance to GM food in Europe is based on consumer hostility, not regulatory barriers. A WTO ruling that forces the door open to GMO imports from North America is unlikely to conceive European consumers and food retailers that GM food is safe. In fact, it may have the opposite effect. Second, the ruling will cement the perception in other parts of the world that biotechnology is being forced upon countries by powerful corporate interests. It is bound to confirm the suspicion in many developing countries that the WTO serves the interests of multinational corporations, not local countries. Third, the GMO dispute may well end up undermining the legitimacy of the WTO if it is seen to erode regulatory autonomy and to ignore the interests of environmental and health protection (Falkner 2007).

In 2014, Russia, France and China banned the import of GMOs (Gunnar, 2014). In his statement Russian Prime Minister Medvedev said, Russia will not import GMO products and also added, "If the Americans like to eat GMO products, let them eat it then. We don't need to do that; we have enough space and opportunities to produce organic food" (rt.com, 2014). products in Russia containing more than 0.9% genetically modified ingredients must be labeled, as opposed to US laws where no labeling is required for genetically modified products despite steadily growing public opposition to the practice. Russia's stance against GMO is mirrored elsewhere, including in France where just recently Monsanto's GM corn was banned and in China where the importing of US GM corn has been illegal. The reaction against GMO has widespread appeal due to well-placed health and environmental concerns among increasingly informed populations. But the drive to push back against GMO in nations like Russia and China also has a geopolitical dimension (Gunnar 2014).

Changing Geographies of Meat Production and Consumption:

'Meat production is a clear villain in the agro-ecological crisis', the reason behind this assumption is, meat production and consumption is interlinked with climate change (through methane emissions), land grabs and deforestation (for growing feed and expanded livestock production) (Sommerville et al., 2014). Meat production is a major contributor to climate change. It is estimated that livestock production accounts for 70 per cent of all agricultural land use and occupies 30 per cent of the land surface of the planet. Because of their sheer numbers, livestock produce a considerable volume of greenhouse gases (such as methane and nitrous oxide) that contribute to climate change. Climate-impacting emissions are produced not just by the animals' digestive systems, but also by the fertilizers and manure used to produce feed and the deforestation taking place to provide grazing lands. In fact, the United Nations Food and Agriculture Organisation (FAO) has estimated that livestock production is responsible for 18% of greenhouse gases (Suzuki 2014). According to UK think tank Chatham House study on Greenhouse gas emissions from livestock, the study says, account for about 14.5 percent of the global total, more than direct emissions from the transportation sector and more than all the emissions produced by the U.S., the world's biggest economy. And it's probably impossible to keep global temperature increases under 2 degrees Celsius, the commonly cited goal to prevent unstoppable global warming, without addressing livestock production and global dietary trends (Pantsios 2014). Meat consumption has a big impact on deforestation, because it uses very large amounts of land. In the last few decades, much of that land—both for pasture and to produce livestock feed, such as soybeans—has come from tropical forests, especially in the Amazon. With continuing global growth in meat consumption per capita and in world trade in meat and feed, the industry has become global, with global consumption driving deforestation (Boucher et al. 2012).

The geopolitical dimension of meat production includes the depletion inborn in the meat based diets of industrialised countries and more generally in the agro-industrial model, and also the broader climatic and trade impact of industrialised agricultural models that have put the production of cheap meat and calories at the core of accumulation strategies (Sommerville *et al.* 2014).

Rising meat production and consumption has long been one of the most powerful trends in world agriculture. This is reflected in the 'meatification' of diets, a term which encapsulates the dramatic shift of animal flesh and derivatives from the periphery of human food consumption patterns, where it was for most of the history of agriculture, to the centre (Weis 2007). The average person on earth consumed[3] 42 kg of meat in 2009, almost double the per capita world average in 1961 (23 kg), along with twice the eggs (from 5 to 10 kg) (FAOSTAT, 2012).

Fast-rising meat consumption in industrializing countries, especially in China and parts of Asia, has been regularly cited as a cause of world food price volatility, sometimes coded simply as affluence-related 'dietary change', with industrial livestock production pulling heavily on grain and oilseed supplies for feed (Jarosz 2009). However, some assessments have downplayed the impact that this demand has had on world food prices (UN 2009), and in general most attempts to place meat in the food crisis have been very partial, while the surging usage of grains and oilseeds in industrial agrofuel production has featured more prominently in explanations of food price volatility and generated more moral outrage. One stark reflection of this can be seen in the recurrent criticism heaped upon the Renewable Fuel Standard (RFS) in the US, which mandates that one-tenth of the gasoline pool of fuel companies must come from ethanol, thereby directing roughly two-fifths of US maize to agro-fuel production (with a spillover effect on the area planted in other crops). This criticism reached a fever pitch in 2012 as prices of important

[3] The production and trade statistics in this paper have been summarized from FAO Statistics database (FAOSTAT 2012). National statistics for meat consumption were derived by adding production and imports together and subtracting exports. At the time of writing, trade statistics were available up to 2009, and production statistics up to 2010.

commodities shot up amidst the severe drought and crop damage across much of the US, and led some House representatives, senators, and state governors to call for a two-year moratorium on the RFS, alongside a coalition of leading organizations in the industrial livestock sector (Blas and Meyer 2012). On a wider scale, the director- general of the FAO connected fears about US production shortfalls to risks of world food and feed price volatility and made an appeal to either lower or suspend the RFS, pointing to the role that agro-fuels had in the 2007–2008 price spikes (Graziano da Silva 2012).

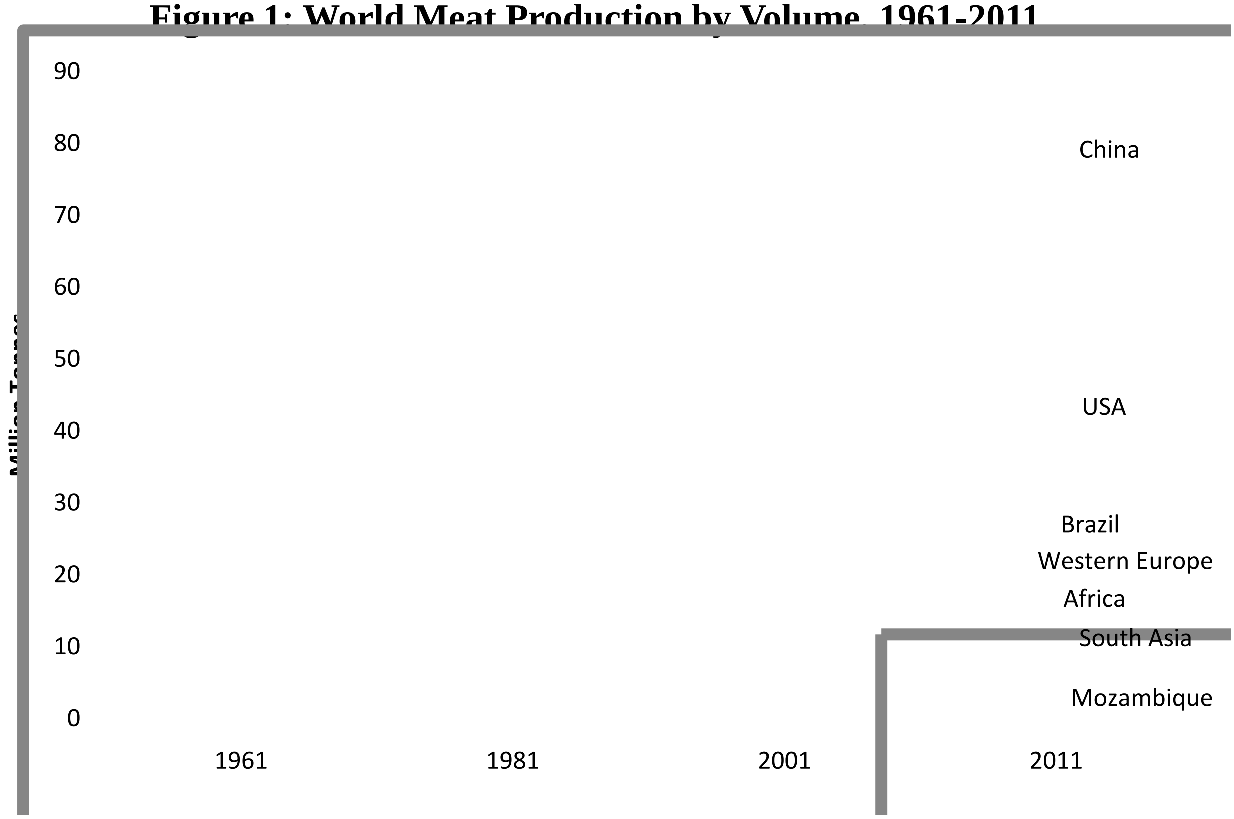
Although rising meat consumption has been a broad global trend, it is marked by extreme disparities. At the apex of the global animal ‘protein ladder’ are the temperate heartlands of the industrial grain–oilseed–livestock complex, led by the US (120 kg per capita in 2009), Australia and New Zealand (118 kg), Argentina (113 kg), Canada (102 kg), and Western Europe (85 kg).6 Taken together, these countries are home to only 12 percent of the world population and yet accounted for 34 percent of world meat production by volume in 2009, along with 30 percent of total meat consumption and 68 percent of world exports. At the other end of the meat consumption spectrum are Southeast Asia (27 kg per capita in 2009), Africa (18 kg), and South Asia (7 kg), and underdeveloped country like, Mozambique consume only 7.8 kg per capita meat, which are home to almost half of humanity but under one-sixth of world meat consumption and production in 2009, keeping in mind that low national per capita averages conceal class disparities in consumption.

In between these poles is where the greatest change has occurred over the past half-century, especially in China and Brazil. From 1961 to 2009, per capita meat consumption rose from 4 kg to 59 kg in China and from 28 to 73 kg in Brazil, with total meat production increasing 31-fold in China and 11-fold in Brazil. In 1961, China and Brazil represented 24 percent of humanity and accounted for less than seven percent of world meat production by volume, but by 2009, with a similar share of humanity, they produced 33 percent of all meat in the world. Brazil has recently emerged as the second largest meat exporting country, and the largest exporter of beef, with its meat exports quadrupling by volume from 2000 to 2009 alone (during which time its share of the world meat exports rose from 6 to 16 percent) (Weis 2013).

This shifting geography of meat is intertwined with rising flows of feed grains and oilseeds. Whereas small livestock populations historically grazed on fallowed land and small pastures, scavenged around farm households, and sometimes fed on locally produced forage stored over winters, fast-rising populations of industrially- reared livestock are being raised on feed that has frequently moved across large distances, both within countries and even across borders. On a world scale, the large majority of coarse grains, soybeans, and rapeseed/canola are fed to livestock. In 2009, almost 446 million ha of these crops were harvested, covering roughly one-third of the world's total harvested land area and representing a 30 percent increase over the past half-century, in step with the growth in the world's total harvested area. This means that livestock effectively occupy a significant share of the 10 percent of the earth's land area that is in cultivation, in addition to the roughly 25 percent of the earth's land area that is in pasture, some of which would be suitable for permanent crops and some of which can only bear very low stocking densities, as throughout most of the tropics, and should never have been converted to pastures (Steinfeld *et al.* 2014).

On a world scale, the areal expansion of feed crops has been primarily concentrated on maize and soybeans. From 1961 to 2009, the area devoted to maize increased by 50 percent and the area devoted to soybeans more than quadrupled, while the area devoted to most other feed crops was relatively stagnant. This has been augmented by large yield gains, which are in turn tied to tremendous input useage, with the net result being that world maize production more than quadrupled and soybean production grew more than eight-fold in a half century. Maize and soybeans are the two predominant feed crops that are traded internationally. Since 1961, the volume of maize exports grew seven-fold and world soybean exports grew eight-fold; more than one-third of all soybean production is now exported. The US was the dominant exporter of both maize and soybeans for many decades, with soybeans principally flowing to Western Europe. However, this began changing in the late 1990s as Brazil and Argentina rushed to expand soybean production and exports, and China's demand for imported feed began climbing with its fast-rising meat production (see Figure 1). From 1990 to 2011, Brazil's soybean exports leapt from 4 to 29 million tonnes, while China's soybean imports spiked from 2 to 45 million tonnes, comprising more than half the world total in 2011 (Weis

Figure 1: World Meat Production by Volume, 1961-2011



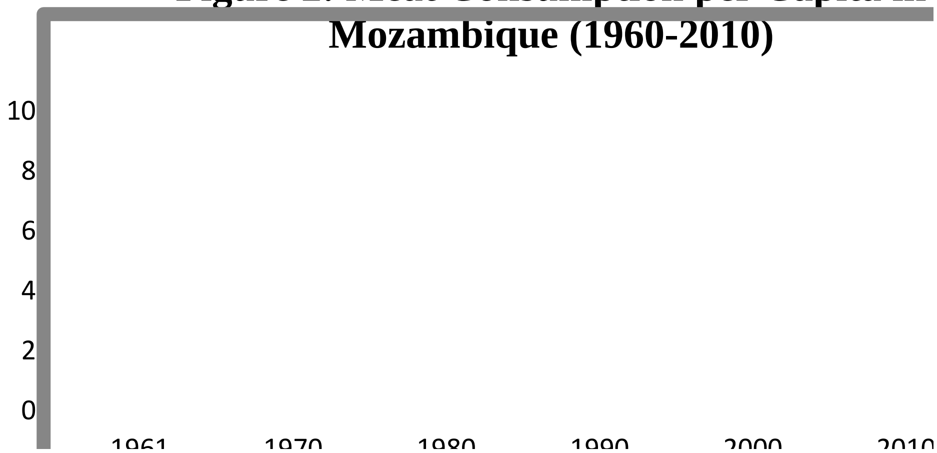
Source: FAOSTAT, 2015.

The FAO estimates that world meat production will rise to 52 kg per person by 2050, which in a world of 9.3 billion people would mean over 480 million tonnes – versus 293 million tonnes in 2010 (42.5 kg per capita). Industrial livestock production is expected to account for virtually all of this future global growth, and because poultry is projected to remain at the forefront, the annual population of slaughtered animals could approach 120 billion (FAO 2011, Robinson *et al*. 2011). Continuation on this trajectory is bound to intensify the demand for industrial grains and oilseeds as feed.

Mozambique contributes only 0.06 % in global meat production in 2011 and consumption of per capita meat is also very low (in 2009, 7.8 kg) from global average (42 kg, 2009). More than half the meat consumed in Mozambique is pig meat, estimated at 52% in 2011, followed by poultry meat at 22% (FAOSTAT). One of the main causes of low chicken productivity is Mozambique's dependence on costly imported chicken feed. Even neighboring big brother, South Africa relies on imported chicken feed, increasing their production costs and making imports from this country into Mozambique just as unattractive. Recently Commercial investment in

Mozambique's poultry industry has come from multiple sources, including the ones facilitated by TechnoServe as part of a US Government supported program (Mazvilla 2015).

Figure 2: Meat Consumption per Capita in Mozambique (1960-2010)



Source: FAOSTAT, 2013

Conclusion:

Biotechnological innovations have always had a role to play in improving agriculture, but the post-1945 model of agriculture has been driven by powerful corporations like Monsanto, which are firmly linked to Pentagon and Wall Street interests. The biotechnology from which genetically modified organisms are derived, is currently monopolized by a handful of very powerful multinational corporations centered in the West. This monopoly forms the foundation of Western hegemonic power. The sizable role of unequal meat consumption in per capita GHG emission disparities ties it to the tense geopolitics of climate change, in which the world's wealthiest countries and most powerful corporations have been unwilling to oppose historic and continuing consumption inequalities and fast-industrializing countries largely refuse confront consumption paths, while the world's poorest people country like Mozambique face the most immediate and acute threats.

References:

- ACBio (2006), The African Centre for Biosafety, “Mozambique – GMO Legislation”, 2 July 2015 URL: http://acbio.org.za/mozambique-gmo-legislation/.
- ACBio (2013), The African Centre for Biosafety, “A Critique of AGRA’s African Agriculture Status Report”, 2 July 2015 URL: http://acbio.org.za/wp-content/uploads/2015/02/AGRA-report-Nov2013.pdf.
- ACBio (2015), The African Centre for Biosafety, “Profiting from The Climate Crisis, Undermining Resilience in Africa: Gates and Monsanto’s Water Efficient Maize for Africa(WEMA) Project”, 3 July 2015 URL: http://acbio.org.za/wp-content/uploads/2015/05/WEMA_report_may2015.pdf.
- Ahmed, N. (2014), “UN: Only Small Farmers and Agroecology Can Feed the World” [Online: web] Accessed 1 July 2015 URL: https://www.tni.org/en/article/un-only-small-farmers-and-agroecology-can-feed-world.
- Boucher, D. et al. (2012), *Grade A Choice? Solutions for Deforestation Free Meat*, Cambridge: UCS Publications.
- Dunn, C and T. Reifer, ‘US Hegemony and Biotechnology: The Geopolitics of New Lead Technology’, Working Paper (2002).
- Engdhal, F.W. (2007), *Seeds of Destruction: The Hidden Agenda of Genetic Manipulation*, Quebec: Global Research.
- Falkner, Robert (2007), “Introduction: The International Politics of Genetically Modified Food”, in Robert Falkner (eds.) *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, New York: Palgrave MacMillan.
- Falkner, Robert (2007), “Introduction: The International Politics of Genetically Modified Food”, in Robert Falkner (eds.) *The International Politics of Genetically Modified Food: Diplomacy, Trade and Law*, New York: Palgrave MacMillan.
- Fiala, Nathan (2009), “How Meat Contributes to Global Warming”, *Scientific American*, New York, February 2009.
- Fitting, E. (2006), “Importing Corn, Exporting Labor: The Neoliberal Corn Regime, GMOs, and the Erosion of Mexican Biodiversity”, *Agriculture and Human Values*, 23(1): 15–26

- Gliessman, S. R. (2007), *Agroecology: The Ecology of Sustainable Food Systems,* New York: CRC Press.
- Graziano da Silva, J. (2012), "The US Must Take Biofuel Action to Prevent a Food Crisis", Financial Times, [Online: web] 5 July 2015 URL: http://www.ft.com/intl/cms/s/0/85a36b26-e22a-11e1- b3ff-00144feab49a.html#axzz280bYFdHg.
- Gunnar, U. (2014), "Geopolitics of Organic Food: Russia, China and France Ban GMOs", [Online: web] Accessed 3 July 2015 URL: http://www.globalresearch.ca/geopolitics-of-organic-food-russia-china-and-france-ban-gmos/5380228
- Hudson, M. (1972), *Super Imperialism: The Origin and Fundamentals of U.S. World Dominance*,London: Pluto Press.
- Mazvilla, D. (2015), "Did You Know?", [Online: web] Accessed 1 July 2015 URL: http://www.speed-program.com/blogs/by-author/domingos-mazivila/did-you-know.
- Pantsios, A. (2014), "Eating Less Meat and Dairy Essential to Curb Climate Change", [Online: web] Accessed 4 July 2015 URL: http://ecowatch.com/2014/12/05/eat-less-meat-dairy-curb-climate-change/.
- Pantsios, A. (2014), "Eating Less Meat and Dairy Essential to Curb Climate Change", [Online: web] Accessed 4 July 2015 URL: http://ecowatch.com/2014/12/05/eat-less-meat-dairy-curb-climate-change/.
- Pitt, W. R. (2003), "The Project for the New American Century", [Online: web] Accessed 23 March 2015 URL: http://www.informationclearinghouse.info/article1665.htm.
- Pollack, M. A. and G. C. Shaffer (2009), *When Cooperation Fails: The International Law and Politics of Genetically Modified Foods*, New York: Oxford University Press.
- Robinson, T. P. et al. (2011), *Global Livestock Production Systems*, Rome: FAO and ILRI.
- Slow Food (2014), "Why we are Against GMOs", [Online: web] Accessed 24 June 2015 URL: http://www.slowfood.com/international/141/why-are-we-against-gmos.
- Sommerville, M. et al. (2014),"The Global Food Crisis and the Geopolitics of Food Security," *Geopolitics*, 19: 239-265.

- Steinfeld, H. et al. (2006), *Livestock's Long Shadow: Environmental Issues and Options*, Rome: FAO.
- Sun Biofuels. (2011). June 2, 2011, URL:http://www.sunbiofuels.com/company.html.
- Suzuki, D. (2014), "Meat and Climate Change", [Online: web] Accessed 3 July 2015 URL: http://www.davidsuzuki.org/what-you-can-do/food-and-our-planet/food-and-climate-change/.
- Todhunter, C. (2015), "Genetically Modified Organisms (GMO): Profit, Power and Geopolitics", [Online: web] Accessed 5 June 2015 URL: http://www.globalresearch.ca/genetically-modified-organisms-gmo-profit-power-and-geopolitics/5419873.
- Wittman, H. et al. (2010), *Food Sovereignty: Reconnecting Food, Nature and Community*, Black Point: Fernwood Press.