The Holistic View of Climate Change: The Displacement of Soil in Vietnam and Morocco

Fabienne-Nell Booker

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The Holistic View of Climate Change: The Displacement of Soil in Vietnam and Morocco

by

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May 2017

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Soil is often treated as a singular biological entity rather than a holistic environment that holds interconnectedness to the social interactions that arise from the treatment, privatization, and loss of the soil. This study serves to expose the holistic nature of soil through analysis of the social externalities that arise from farming techniques which narrowly focus on the biological functioning of soil. Analysis of how these interactions are impacted, approached, and permitted in Vietnam and Morocco is presented through two techniques used globally to increase soil productivity—chemical fertilizers and drip irrigation. Both techniques serve to displace soil not only in a biological/physical sense, but in a political sense as well.

The demand for these procedures comes from agricultural development, ultimately driven by neoliberalism to expand and privatize in the name of economic growth. Fertilizers and drip irrigation as inputs for agricultural production not only continuously contribute to climate change, but ultimately lead to unfair privatization and displacement of land, dispossessing people and tearing away at the social fabrics of the farming community in the name of ‘efficiency’.

Abstract

Soil is often treated as a singular biological entity rather than a holistic environment that holds interconnectedness to the social interactions that arise from the treatment, privatization, and loss of the soil. This study serves to expose the holistic nature of soil through analysis of the social externalities that arise from farming techniques which narrowly focus on the biological functioning of soil. Analysis of how these interactions are impacted, approached, and permitted in Vietnam and Morocco is presented through two techniques used globally to increase soil productivity—chemical fertilizers and drip irrigation. Both techniques serve to displace soil not only in a biological/physical sense, but in a political sense as well.

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Acknowledgements

This research was conducted during a semester studying abroad with the School for International Training/International Honors Program. The program was focused on studying climate change comparatively throughout San Francisco, Vietnam, Morocco, and Bolivia concentrating on the politics of the food, water, and energy nexus. The objective of the program was to study some of the world’s most vulnerable and productive landscapes in terms of climate change. Research was conducted throughout a four-month period from August to December of 2016 collecting data throughout all countries, and ultimately narrowing in on two—Vietnam and Morocco. Data was collected through site visits, readings, interviews, and lectures through meetings with local officials, non-governmental organizations (NGO’s), professors, researchers, activists, business people, local farmers, fisherman, and other laborers; further application of this data was applied to the research statement.

There are countless professors, lecturers, farmers, activists, and peers who I met throughout my program who have contributed hugely to my scholarly growth through this research. My traveling professor, Dr. Priya Chandrasekaran, offered countless hours of guidance, review, and advice on my topic to allow it to become its final product; it is to her I owe the utmost gratitude. I would like to thank Dr. Russel Briggs; it was his FOR 345 Soils class fueled my fascination with the incredible resource of soil. Dr. Lisa Brossenbroek in Morocco allowed me to view soil
displacement in a more political rather than physical/biological perspective which was the framework for my paper. I would also like to thank my honor’s advisor Dr. Andrea Feldpausch-Parker for all her help during my semesters with organizing abroad courses, capstone credits and overall guidance as well as for being so willing take on the role as my honors advisor. Without her patience and support I would not have considered applying this research to the ESF Honor’s Program. Dr. Kurt Stavenhagen was a crucial part of the process in being able to go abroad in the first place through his writing of a recommendation letter that lead to acceptance into the abroad program. Dr. Stavenhagen has further been a key player in the development of my writing through several of his writing classes. I am very thankful to have him as one of the readers for my honors thesis. Finally, I would like to thank Dr. Bill Shields for reaching out and informing me on the qualifications for the ESF Honor’s Program, without his notification I likely would have never known I could pursue this honor.
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Introduction

There is a disconnect between the worlds of the social sciences and biophysical sciences. These areas of study in our society seem to be drastically separated when they are in fact intricately interconnected. A narrowed focus on the biophysical demands of our environment can intensify the social needs that sprout from these assets of our earth. From water to air to plants to soil, these resources have huge implications for our world on both biophysical and societal levels. Soil on an ecological level has extremely strong relationship ties to how it functions. However, by focusing on the just the soil itself you completely miss out the strong relationship tie it also has to people and the social interactions of people to the environment. With all of this in mind there is great importance in examining the human relationality to soil with soil as a holistic environment. As mentioned earlier, soil is often treated as a singular entity rather than a holistic environment that holds interconnectedness to plants, crops, land, and the social interactions that arise from the treatment, privatization, displacement, and loss of the soil. Focusing specifically on agriculture, I compare how these interactions are impacted and approached in Vietnam and Morocco. This study ultimately examines the impact of how a narrow ecological view of the soil can exacerbate issues on a social level.

The impacts of two farming techniques used globally in the agricultural industry—chemical fertilizers and drip irrigation—were analyzed for this research, focusing specifically on the use and impacts of fertilizer in Vietnam and drip irrigation in Morocco. These techniques expand agricultural production by making the soil more

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1 Later defined in detail
fertile, yet they also discount social issues that arise from using these measures. Aside from health and environmental issues, as well as ultimately continuously contributing to climate change, these methods also contribute to the loss or privatization of the soil and land. Consequently, we are sacrificing social needs by focusing on the productivity of soil for agriculture in order to increase ‘efficiency’ in agricultural development. The emphasis on development shown in the agriculture industry is ultimately fed by neoliberal influence to expand and privatize in the name of economic growth. Fertilizers and drip irrigation as inputs for agricultural production ultimately leads to unfair privatization and loss of land, dispossessing people and tearing away at the social fabrics of the farming community in the name of ‘efficiency’.

**Viewing Soil Holistically**

Soil is not just a singular entity. It is completely vital to the functioning of our natural world through its relationships. It is responsible for the existence of trees, plants, grasses, crops, crucial habitat for microorganisms, interface between earth and atmosphere, and as learned in Dr. Briggs’ Soil’s class-- it is a biogeochemical membrane. It has the responsibility of being a biological, geological, and chemical lining of earth. However, one huge aspect of soil that is minutely analyzed in the study of soil is how the dependency on soil and land across the globe has huge implications for the survival of billions of people who are dispossessed due to agricultural development and the forces of climate change. This is where the cruciality to view soil holistically comes into play. ‘Holistic’ according to the Merriam-Webster Dictionary is defined as: relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts (“Definition: Holistic,” n.d.). Applying this idea to a
lens of viewing soil as a whole system-- encompassing the human relationality that comes from the interactions of the soil-- is where we find clarity and acceptance of the social injustices associated with soil degradation and control.

By failing to acknowledge the importance of viewing soil holistically we are not just ignoring these social issues but in fact intensifying them. Focusing on the individualistic biological needs of the soil has huge implications for the surrounding community and beyond. In a world where profit in the agricultural sector has become the holy grail, efficiency is the staircase to that grail. And with our continual exhaustion of soils to produce high yields two key measures have been used in recent history to further increase soil productivity-- drip irrigation and fertilizers. Both of these techniques concentrate on the specific biological needs of the soil without consideration to the social externalities post-implementation. Drip irrigation is a process of irrigation where water is slowly dripped at a gradual rate directly onto the soil for crop production (Camp, 2000). Fertilizers are a substance added to soil to increase its fertility (“Definition: Fertilizer”). Both inputs pacify the independent ecological needs of soil by focusing on scientific functions that contribute to its productivity, thus disregarding any social externalities that arise from this micro-focused application.

Fertilizers

Introduction to Fertilizers

Fertilizers and drip irrigation first came on the market for commercial use in the early to mid 1900s to increase agricultural productivity for growing food demands. Chemical fertilizers became sought after on the market for commercial use after World War II through the Green Revolution in the 1950s (Cunningham, n.d.). The natural
process of soil fertilization is characterized by a cyclical relationship, further explained through Karl Marx’s concept of ‘metabolic rift’. Soils in a natural environment receive its nutrients from the plants, when the plants die and decay this organic matter adds nutrients to the soil aiding in soil quality, allowing it to support plant life once again. Agriculture dislodges this relationship by needing an outside input to replenish soil nutrients. The nutrients of the soil, in the form of produce, are now sent long distances. But the nutrients that would normally be fed back into the soil in the form of human and animal waste is not returned (Moustakbal, 2016). Prior to World War II most farming was done on small-scale family farms with the use of manure as this outside input to organically fertilize the soil. The Green Revolution saw the shift to big industrial agriculture farms which were reliant on chemical fertilizers to provide a faster and cheaper yield compared to natural fertilizers (Food First, 2016). Chemical fertilizers aid in soil productivity by adding one or more macronutrients essential for plant survival—nitrogen, phosphorus, and potassium. However, these synthetic fertilizers do not hold the benefit of the healthy balance of nutrients found in natural fertilizer. Furthermore, the complex relationships to maintain soil quality requires a much more intricate process than just saturating the soil with these nutrients, consequently fertilization alters the natural soil chemistry. Chemical fertilizers are known to have disastrous effects on water sources, human health, and the health of the soil by transforming the natural chemical balance of soils. Excessive nutrients in soil can ultimately have adverse effects on plant health and contaminate the soil (Allen, 2015). Long-term synthetic fertilizer use has been shown to actually degrade soil quality, contributing to the global phenomenon of topsoil loss that is responsible for the loss of half of the world’s topsoil in the past 200 years (“Soil Erosion and Degradation,” n.d).
Chemical Fertilizers in Vietnam

The use of chemical fertilizers is a technique used on a large scale in Vietnam. Agriculture as an industry has transformed the Vietnamese economy in recent years, converting Vietnam from an ‘undeveloped’ country to a ‘developed’ one. When considered in contrast to the detached western supermarkets, a shallow look around the Vietnamese food markets spilled out in the busy streets of the country would leave the impression of home-grown, accessible, organic produce in full abundance in Vietnam. However, this is far from the case—2.3 million metric tons of fertilizer is used in Vietnam per year (Heffer, 2009). During a guest lecture from Action for the City, a non-governmental organization (NGO), in Vietnam that promotes sustainable cities, the representative explained that in Vietnam there is “not much natural stuff on the market” and that residents have a general acceptance of this (Giang, 2016). A visit to a local organic farm in Hoi An also revealed the difficulty of surviving as an organic farmer in a conventional farming driven society. Mr. Duong Ba Hien and Mrs. Nguyen Thi Dong of the farm explained how they originally were part of a ten-family program to promote organic agriculture until the other nine families dropped out due to the decrease in income and slower crop yield experienced through organic farming. This family had chosen to switch to organic for the safety of the family after witnessing first-hand the effect of chemicals on crops. From the switch the family has noticed that the ground is “more stable now” against extreme weather occurrences—which are a major component of global climate change (Hien, 2016). During an interview with the farmers on a later date, more detail was placed on this statement. The farmers further described that because the soil is more fertile due to the use of natural inputs it is now stronger and can hold up
better to extreme storms, flooding, and disease-- incidents that are intensified and made more common by climate change.

**Climate Change and Fertilizers**

Vietnam is a country that is incredibly vulnerable to climate change, providing more of a cruciality to use soil-preserving techniques including the termination of fertilizers that deplete soil quality. Vietnam has climate risks of extreme temperature patterns, salinity intrusion due to sea level rise, flash flooding, and prolonged drought accompanied by torrential downpour at the chance of a rain event which further contributes to erosion due to the strong force of water (Vinh, 2016). These climate change impacts have reduced agricultural land in areas prone to flooding and erosion, specifically upland areas (Wells-Dang, 2016). With 41% of agricultural land in Vietnam categorized as ‘very vulnerable’ to floods the absolute necessity to preserve soil is becoming increasingly important to reduce soil loss. In the Vu Gia Thu Bon river basin 65% of the basin area no longer has a stock of a natural fertilizer as the supply of nutrient-dense sediment that would usually flow downstream has been blocked by upstream hydropower dams (“Downstream Vu Gia,” 2016).

**Loss of Natural Fertilization Increases Dependence on Chemical Fertilizers**

The importance of natural inputs to aid in soil fertility was continued by Mr. Nguyễn Hữu Thiện in his lecture on the impact of hydropower on the Mekong delta. Mr. Nguyễn Hữu Thiện highlighted how the reduction of downstream sediments from the construction of the dam decreases soil quality on downstream farms. Considering that the Mekong delta is ranked sixth in the world for sediment load, this significant reduction has concerning effects on the food security of the country and the 60 million people who rely
on the delta (Thiên, 2016). He stated that “fertilizers cannot replace sediments” but that because of the lack of nutrients delivered from upstream sediments due to the construction of the dam this has made farmers more reliable on fertilizers (Thiên, 2016).

**Soil Loss in Vietnam**

Reducing topsoil loss in Vietnam is crucial to the availability of fertile land for survival. The cumulative soil loss for Vietnam in the past 50 years under four of the country’s heaviest land use crops-- rice, sugarcane, fruit trees, and eucalyptus-- results in 12,100 tons per hectare (The, 2001). This extreme soil loss facing Vietnam is contributed to their widespread use of corrosive land-use techniques as an urgent need of poverty stricken farmers to meet the demands of the competitive development model. Soil loss due to conventional farming techniques including fertilizers combined with the forces of climate change have dispossessed people relying on these lands for their livelihood.

**Drip Irrigation**

**Introduction to Drip Irrigation**

To turn the tables from fertilizer to another procedure used to increase productivity of the soil is the use of drip irrigation. Drip irrigation made its mark on commercial agriculture after the first practical drip irrigation system was patented in 1959 and has since been named ‘the world’s most valued innovation in agriculture’ since the 1930s (Camp, 2000). Drip irrigation waters the soil in a more efficient manner by allowing small quantities of water to drip directly onto the soil over long periods of time through a network of tubing and emitters. This method was revolutionary in terms of water efficiency in the agricultural world as it transformed the process of watering crops from spraying water aimlessly over a large area using a sprinkler or spray system, to this
micro-method of watering exactly what needs to be nourished. With drip irrigation providing ideal growing conditions, reducing runoff, and using 20-50% less water than conventional methods one might wonder why this method would ever be contested (Ward, 2008). Despite the wonders of drip irrigation, the intricacies of this method with land privatization and the realities of who it works for and at what costs become an overarching theme with drip irrigation in Morocco.

**Drip Irrigation and Climate Change**

Morocco is a country highly dependent on agriculture. Agriculture accounts for 18% of the Moroccan economy’s output and 33% of its workforce (Benhassi, 2016). Being in the susceptible MENA (Middle East North America) region climate change is proving to have prominent effects on the country. Raising temperatures, changing rainfall patterns, increased incidence of extreme weather, rising sea level, ocean acidification, and of course drought is wreaking havoc on Morocco’s agriculture (Benhassi, 2016). In a country as susceptible to drought as Morocco, drip irrigation has made crop yields increase while seemingly allowing water usage to decrease.

**Drip Irrigation Subsidy Challenges**

Due to its overwhelming efficiency in the production of agriculture, government-issued subsidies started in 1986 as an incentive for its adoption. The last program in 2006 covered 60% -100% of the investment costs (Venot, 2014). Yet, these programs are largely aimed at larger-scale private commercial farms, given priority due to their ‘high potential’. In the late 1990s to early 2000s work started towards a new wave of drip irrigation through the advancement of low cost drip for the developing world through subsidies. Government aid agencies, NGO’s, and social enterprises sought the promotion
of drip irrigation for small-holder farms in developing nations as a means to alleviate
poverty and food security in the regions. Yet, most economic growth in the field was
shown through relations between farmers and agribusiness who deal with the material
manufacturers rather than the growth of individual farmers (Venot, 2014). Furthermore,
the eligibility and process of application for these government subsidies is long, hefty and
oftentimes unreliable. Water rights, land size minimums, the expensive initial price
required for installing the drip irrigation system, and the complex administrative process
often limits how small-scale farmers can benefit from this process (Venot, 2014). On top
of this, applying for reimbursement is difficult and can take as long as three years. In
some cases, the application is left unprocessed, leaving the financial burden on the farmer
who then falls into debt (Badran, 2012). Farmers also receive back their investments
based on quality of the irrigation system, the higher the quality of the equipment the
higher the percentage of reimbursement. However, because of inconsistencies with
interpreting the quality, farmers may not receive the reimbursement anticipated (Badran,
2012). Considering all these technicalities, the bureaucratic process of accessing this drip
technology oftentimes is too complicated or too risky for farmers to favor and if they do,
the process succeeds to continually marginalize small-holder farmers in Morocco.

**Drip Irrigation and Loss of Land**

Farmers who can invest in drip irrigation and water rights in the form of deeper
tube wells and drilling for groundwater often lead to the displacement and
marginalization of those farmers who cannot. This created a greater inequality between
those farmers who did and did not have access to groundwater. The difficult access to
water affected yields and revenues for small-scale farmers who then had to switch to less
profitable crops for survival. Farmers who invested in drip could expand their land on a larger scale from increased income and access. Small-scale farmers who faced the debt from the competition of drip irrigation had their land bought by local farmers and investors who then invested in agribusiness firms (Houdret, 2012). This shift in land control has resulted an increased privatization of land by corporate entities and an increase in ‘efficient’ agricultural technologies used on the land, including drip irrigation to nourish the soil. This issue not only perpetuates the marginalization of small-holder farmers and their land but also continues to stress groundwater sources to their limits. Drip irrigation is the continued use of a scarce and overexploited resource in a country that is already facing dire water restrictions. Yes, drip irrigation uses less water per hectare than traditional forms of irrigation, but considering the expansion of irrigated land due to this process how much water is really being saved? (Bossenbroek, 2016) Agriculture continues to remain the largest consumer of water in Morocco, despite the resource’s continued decline.

The implications of drip irrigation were further presented through a visit to an orchard in the Atlas Mountains where the effects of climate change were described by farmer, Jawad Mamou. Jawad showed us his depleted water well and explained how the “dry hot air wreaks havoc on agriculture”, creating a further reliance on drip irrigation to nourish the soil that previously would be “like cement” (Mamou, 2016). Jawad reiterated that drip irrigation is subsidized 100% by the Moroccan government, but they don’t cover any of the costly repairs if the system breaks. He continued that the government also does not support knowing how to use the system-- “no technical support, no education, no nothing” (Mamou, 2016). Jawad explained that he is “suffering the consequences of bad
maintenance of the system” and that now he has a “mess of drip irrigation” (Mamou, 2016). Jawad continued with saying that “crooks haggle with the receipts and they are practically making money” talking on the corrupt money-making schemes within the private sector of the process (Mamou, 2016).

**Green Revolution**

This switch in developing nations from traditional small-scale farming to the industrial farming characterized by the unsustainable practices we know today can be accredited to the Green Revolution. This transformation between the 1930s-1960s dramatically changed the field of agriculture in these countries with the introduction of new advances. Chemical fertilizers, synthetic herbicides and pesticides, large-scale irrigation systems, and high-yield crops were created to increase yield. While this revolution managed to produce increased crop yield to supply the growing population with cheaper food it also had disastrous effects on the environment including soil degradation and drought from extensive irrigation practices (Cunningham, n.d.).

Executive director of Food First, Eric Holt-Gimenez, explained how the Green Revolution destroyed the soils of these developing nations and through this, lowered their resiliency to the natural disasters brought by climate change. Holt-Gimenez explained his work on resiliency in Latin America after the destruction of Hurricane Mitch in 1998. He helped conduct a study across 350 communities in Central America which found that sustainable farms had more topsoil, higher field moisture, more vegetation, less erosion, and lower economic losses than conventional farms after Hurricane Mitch (Food First, 2016). Holt-Gimenez’s study described the substantial effects of the Green Revolution on
not just the soil and environment but also on the livelihood of those dependent on the farms.

**Concept Application**

**Common Land Transitions to Property**

The desire in our society to continually expand and develop through farming technologies goes beyond just a fascination. It is ingrained in our society through the complexities of capitalism\(^2\) which influences neoliberalism\(^3\). This transformation of land ownership going from the common land to become property holds its philosophical roots in the 1600s described by philosopher John Locke in his theory, “Of Property”. Locke describes how land was given by God to all mankind in common and that it is given to men for the “support and comfort of their being” (Locke 18, 1689). This statement alone is justification for exploitation of the land for the desires of man. Locke continues to claim that because the earth is part of the commons all that earth produces is in common and that nobody could previously have private sovereignty “exclusive of the rest of mankind” (Locke, 1689). Locke continues to tell a story of a man gathering apples and asks “When did [the apples] begin to be his?” (Locke 19, 1689). Locke describes that this transition is created by the application of labor—the distinction between property and the commons. Since labor belongs to a singular person, its application removes the good from the common state to private. Locke states, “as much as man tills, plants, improves,

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\(^2\) An economic system based on private or corporate ownership of capital goods and the means of production for profit. Competitive free markets determine prices, production, and distribution of goods with investments determined by private decision (“Definition: Capitalism,” n.d.). It is characterized by material social relations. A process of expanding wealth for a social class (Chandrasekaran, 2016).

\(^3\) Policy model of economics that transfers control of economic factors from the public to private sector. Characterized by privatization and an open market system with a laissez-faire approach to development (“Neoliberalism,” 2016).
cultivates, and can use the product of, so much is his property” giving complete approval for the very practice that destroys our soils-- exploitation of land (Lock, 1689). Plenty of statements made by Locke justify the exploitation of earth for man’s own interest. He states that God gave the world to man “for their benefit” and for the amenities of life “that can be drawn from it”. He continues by saying that it cannot be assumed that God meant for earth to “remain common and uncultivated”, yet why is it that land cannot remain uncultivated? (Locke 21, 1689). This statement provides pure vindication for man to exploit nature based on the assumptions of a supreme being. With these statements, Locke alters the intrinsic value placed on our natural world believing that their value “depends only on the usefulness to man” and that “land that is left wholly to nature…. indeed it is, a waste” (Locke 21, 1689). This warped valuation of nature with earth only having value when exploited rather than in its natural state is used to this day in justification of development.

Commodification of Land

In exploiting land for benefit comes the exploitation of land for profit by creating commodities from the land, or moreover commodifying the land as a whole. We have witnessed the commodification of land through the privatization of nature presented earlier. Yet this reality is so distorted because land, by definition, cannot be commoditized-- though our society has done just that. Karl Polanyi’s “The Self-Regulating Market and the Fictitious Commodities” points out that land, labor, and money are essential points of industry but due to definition they are not commodities. This argument is incredibly inconsistent to modern day capitalism where land, for one, is most definitely commodified for profit. Commodities by definition are “objects produced
for sale on the market” (Polanyi 75, 1944). Technically speaking, this definition would in fact make land, labor, and money not commodities. Polanyi goes on to give a more articulated definition of why these services are not commodities. He points out that labor is “human activity” that is ultimately not produced for sale, land is “nature which is not produced by man”, and finally that money is “a token of purchasing power.... that comes into being through the mechanism of banking”. Polanyi further points out that these things are not produced by man and not produced for sale; therefore, their commodity description is fictitious (Polanyi 75-76, 1944). This reiteration exemplifies simply just how distorted this commodification of land is. The simplicity of the fact that land, labor, and money are not produced by man for sale puts in real terms the level of which humans have placed themselves above the natural happenings of the market system. Man has taken a natural process beyond our creation and put economic value on it, therefore commoditizing something, such as land, that by definition is not a commodity.

**Primitive Accumulation**

The importance of land in the accumulation of capital which feeds the whole privatization issue is described by Karl Marx’s theory of ‘primitive accumulation’. The process of how money is changed into capital is described by Marx as the starting point of a capitalistic mode of production. This theory of capital accumulation is described as ‘primitive’ because it is “the first initial instance that sets off the cycle of [capital] accumulation” (Chandrasekaran, 2016). This theory is on the basis of making capital from money, then from capital making surplus-value, then from this continually making more capital. Marx claims this is by a means of appropriation, or taking, of labor and land for that initial means of making capital. Primitive accumulation is ultimately “the process
of divorcing the producer from the means of production” (Marx, 1999). Once the laborer is dispossessed from his work, then capitalism “can stand on its own legs” maintaining and reproducing this separation (Chandrasekaran, 2016). This initial capital is in the form of exploitation of land and labor exhibited by present day land grabs, property expansion, free trade, and structural adjustment (Chandrasekaran, 2016). Expressed by Marx, “the expropriation of the agricultural producer, of the peasant, from the soil, is the basis of the whole process” (Chandrasekaran, 2016). Land plays an integral role in the formulation of the capitalist system through exploitation and commodification of the land which is a common theme through the privatization of land and soil. This exploitation of labor and land to make profit can be applied to modern day monoculture strategies of farming. Monoculture became a popular farming method because of its characteristics of less time and less work meaning that less people are needed for labor. This makes it very difficult to mobilize the switch to organic farming because the externalities associated with monoculture farming are pushed onto the environment, much like how capitalist expansion pushes costs into “invisible” or “free” spaces (Chandrasekaran, 2016). This externalization applied to monoculture pushes its costs onto the soil, thus creating a greater need for fertilizers to alleviate these ‘costs’.

Neoliberal Narratives for Privatization

Backtracking to John Locke’s warped valuation of nature whereby earth is only seen having value when it is exploited provides justification for present day neoliberal mechanisms of land grabbing. Land grabbing is the buying or leasing of large pieces of land in developing countries by domestic or transnational entities. This is often done by

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corporations that buy the most fertile land from poor countries to secure land for growing food (Benhassi, 2016). This phenomenon is witnessed in Morocco through the privatization of land by foreign beings for profit in the agricultural sector. Morocco is the eighth most land grabbed nation where 700,000 hectares of land have been grabbed by foreign nations for agricultural production (“15 Most…,” n.d.). As described earlier, the implementation of drip irrigation aids in this expansion and privatization through land grabs. The narratives used as mechanisms for land grabbing revolve around this idea of ‘efficiency’ and ‘development’, described in the article “Introduction to the Special Issue: Water Grabbing? Focus on the (Re)appropriation of Finite Water Resources”. The author highlights the narratives around land and water grabbing that are used to justify the taking of these resources. The ‘underutilized’ narrative is used to justify promotion of agricultural production using conventional/unsustainable methods. Governmental and private sector officials use this narrative for water and land grabbing where the resource is considered ‘wasted’ if it is left without being utilized for irrigation, energy, or other purposes” (Mehta 200, 2012). This feeds into the ideology outlined by John Locke that that resources must be exploited to be valued. The narrative of ‘untapped abundance’ is also used to further investment required to “unlock potential” and “drive the engine of development” (Mehta 200, 2012). Africa apparently has an ‘abundance of land and resources’ yet it suffers from scarcity because it can't develop these sources” (Mehta 200, 2012). These narratives for land grabbing provide legitimization for neoliberal development based on the idea that these sources must be developed to be valued, yet the overexploitation is pushing these sources to their limits.
Neoliberal Narrative: Structural Reform

Another narrative explained through the land grabbing ideology is the use of structural reforms to change the politics applied to land tenure to allow big corporations to come in and develop (Mehta, 2012). Structural adjustment programs (SAPs) are a key part of Morocco’s neoliberal influence. SAP’s are a set of economic policies introduced as a condition for gaining a loan from the International Monetary Fund (IMF)—an international organization promoting sustainable economic growth through facilitating trade. SAPs usually involve a combination of free market policies such as privatization, fiscal austerity, free trade and deregulation but ultimately give foreign bodies influence over key economic issues in developing economies with privatization from outside entities often benefitting only a small rich elite. These programs also serve to cut subsidies and welfare programs that benefit the poorest in society.

Structural Reform: Vietnam

Doi Moi is the name of the economic reforms of Vietnam in 1986 which created a remarkable transformation in the economy and agricultural sector. It led to rapid development of farming, introduced private land rights, opened markets, and ultimately increased agricultural output (Dũng 9/16). The liberalization of the fertilizer trade in Vietnam contributed to the more intensive use of chemical fertilizers, quadrupling their use since the 1980s (Son, 2016). This opening of markets allowed outside forces in the fertilizer trade where almost all of Vietnam’s agricultural chemicals are from China and the U.S. (Hien, 2016). Vietnam’s current fertilizer imports amount to 446.6 thousand tons with China covering 46.4% of total imports (“Vietnam Fertilizer…,” 2016). Though my
research does not focus on fertilizer application in Morocco it is by no means exempt from the horrors of the fertilizer industry, in fact it feeds it. While Vietnam receives its fertilizers through imports from China and the U.S., Morocco actually has the largest phosphate reserves in the world, 90% of which is used for fertilizer production making Morocco the largest exporter of phosphate rock (Moustakbal, 2016).

Fertilizers and the Private Sector

In 2008 an operation for a joint venture between Vietnamese fertilizer company, Petro Vietnam Corporation, and the Morocco Phosphate Company was established to build a manufacturer of phosphate in Vietnam as part of both country’s desire to increase foreign trade and development (Chi, 2016). The world’s largest phosphate reserves reside in Morocco where it is the largest exporter of phosphate in the world, primarily for fertilizer use. Morocco covers 70% of U.S. phosphate imports where its price is continually increasing due to increased demand of the finite resource (Moustakbal, 2016). Population growth causing an increased demand for food results in heavier demand for fertilizers to increase output. The fertilizer industry was on the forefront of meetings at the recent UN COP 22 climate conference held in Morocco. Conversations revolved around the pure contradiction of “technology” as the climate solution even though the technologies supplied by these big businesses have been shown to actually exacerbate climate change (“Big Business,” 2016”). The agricultural development strategies focused on promotion of fertilizers which pollute the soil and contribute to GHG emissions. These contradictory and confusing strategies to combat climate change may not seem quite as perplexing when considering the supporters of this year’s African COP are the African development banks and corporations that are in fact the main drivers of climate change.
The president of the African Development Bank (AfDB) even declared himself “in line” with the CEO of the Office Chérifien des Phosphates (OCP), the world’s leading producer of phosphate rock. Furthermore, the Global Alliance on Climate Smart Agriculture (GACSA) which is hosted by the UN Food and Agricultural Organization (FAO) is made up of 60% private sector members from the fertilizer industry (Sabido, 2015). COP22 seems to have laid out the platform for private companies to profit from green investments, proving the overarching power of private, development-oriented neoliberal forces conflicting with strides for the environment.

**Structural Reform: Morocco**

Morocco’s structural adjustment programs initiated from 1979-1993 resulted in the privatization of 80 public companies and offices, liberalization of all public sectors, and created free trade agreements with 56 countries (Khomsi, 2016). Guest lecturer, Omar Azike exemplified the issues associated with Morocco’s export economy through his lecture on the marginalization of subsistence farming due to the support for investments in exports. Azike talked from his own personal account as farmer who was dispossessed from his land due to debt caused by these policy changes. The policies led to supporting the “emergence of an ag. capitalist minority depending on international market needs” through the transfer of half million hectares of land to big land owners as a way to organize and upgrade farms to an export-oriented market (Aziki, 2016). These structural adjustment programs from the early ‘80s marginalized 90% of subsistence agricultural lands, putting 80% of rural people in poverty. There was a reduction in investments and subsidies to agricultural services and the transfer of numerous activities to the private sector with the privatization of many strategic farming companies. These
structural reforms resulted in the “impoverishment of small farmers who represent ¾ of total land owners” (Azike, 2016). Omar Azike is a prime example of development through structural adjustment programs legitimizing these processes of privatization at the cost of dispossession.

**Morocco’s Approach to Land Grabbing**

Guest lecturer, Professor Benhassi spoke about land tenure in Morocco and the criticisms of the Morocco Green Plan. Benhassi spoke on the land ownership issues in Morocco where the highest quality land is owned by the state, thus having the liberty to sell to others. Farmers who don't have land consequently lose their ability to make food. The Morocco Green Plan tries to manage this by increasing access to ownership of land and creating measures to make the process of governmental land leases more socially sustainable (Benhassi, 2016). The plan’s proposals intend to alleviate the forces of land grabbing through support of small-scale farms. The plan recognizes that arable land is declining from urbanization, land grabbing, and exploitation of land specifically by corporations. The Morocco Green Plan is a plan of action to tackle these issues. The plan is a multi-billion-dollar European program launched in 2008 which aims at making agriculture “a lever for growth” (Benhassi, 2016). This plan aims to: increase the sector’s profitability and boost development by seeking private investment in regions with high agricultural potential, provide for modernization of farming methods in arid regions, increase environmental protection standards, and introduce new models of agriculture value chain governance such as aggregation and public-private programs (Benhassi, 2016). The aggregation model is a method of enabling the access of smallholder farmers to land through the setup of a cooperative and providing access to other inputs such as
funding from banks and fertilizers. The plan consists of a two-pillar system with the first pillar categorized by the invigoration of a high value-adding, highly productive farming system and agro-industry through an aggregated model (Benhassi, 2016). This pillar aggregates farms to overcome the constraints of land fragmentation and to ensure access to modern technologies, investment, and markets. Massive investments support new actors with strong management capacities. This first pillar is in contrast to the second pillar which provides more support for small-scale farmers. The second pillar is categorized by development of small-scale agriculture but on solidarity in unflavored areas. This pillar aims to modernize small-scale agriculture by improving productivity and orienting farms towards ‘promising production opportunities’—whatever this may mean. The main objective of this pillar is to help reduce poverty at its roots and maintain a rural-urban balance. Though this plan seems to be well-intentioned the first pillar overshadows the small-scale farm plan and with its emphasis on modernizing farming techniques it will be more vulnerable to desertification and erosion (Benhassi, 2016).

**Conclusion**

Preserving soil on an ecological and social level is a concept with importance beyond what is imaginable. There are huge benefits in preserving soil ecologically and socially as healthy soil systems are an adaptation and mitigation strategy in one. Healthy soils play an integral role in absorbing carbon and filtering water, allowing it to play a part in climate change mitigation through its role as a carbon sink. The destruction of soil creates a cycle where less carbon is absorbed thus contributing to climate change and further degrading the land (Arsenault, 2014). Fertile soil has also proved to be an adaptation strategy through its resiliency to the forces of climate change. As explained at
Food First and by multiple farmers in Vietnam the fertile soil creates stronger crops which hold up better against natural disasters caused by climate change. This reduces the destruction caused by climate change which would be further advanced through degraded soil systems.

Dispossession of the land through the forces of our changing world as well as shifts in ownership has created an extensive climate refugee phenomenon in our world. This destruction of the soils and dispossession of the land exacerbates food insecurity and poverty, leading to climate migrations in search of new livelihoods. There are currently 10 million climate refugees in Africa alone and that number is expected to rise to 200 million by 2050 (Adaption of African Agriculture, 2016). Shown through this research, the extensive use of farming techniques created for efficiency and productivity feeds the question of: productivity for whom? The cruciality of considering the externalities of these farming techniques goes beyond environmental issues, it becomes a human rights issue.
Works Cited


