

Potential food crisis in our midst

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Potential Food Crisis In Our Midst The current state of global food security is by no means secure. With about seven billion people currently living on the planet and projections of the world population reaching nine billion by 2050 there is a very adequate reason to be concerned about the amount of food we have globally. If we can't feed the amount of people currently living on the earth some serious changes must be made in order to sustain the much larger projected population. This is a very complex issue partly because so many of the food, economic and agricultural problems we face are so closely related to one another. In the past measures have been taken to produce more food, but have come at serious environmental costs. We must focus on ways to increase the productivity of current croplands through better management systems, as well as designing diverse agricultural systems that are more efficient on a local level. Science suggests that the use of agroecology could be the solution to effectively resolving the food crisis and better sustaining our ecosystem services. " Countries can and must reorient their agricultural systems toward modes of production that are not only highly productive, but also highly sustainable. " (Schutter, 2011). This quest for productive, yet sustainable forms of agriculture could be the only way to have any type of food or environmental security as the demands of our population immensely increase. So what exactly are we dealing with now? In the past 50 years we have globally tripled our food production, and it is projected that we need to double or triple our production yet again by 2050 in order to supply the demand for food.(Beall, 2012). " At the start of 2011 the food industry is in crisis. World food prices have risen above the peak they reached in early 2008, and the last time that happened hundreds of

millions of people fell below the poverty line. "(Parker, 2011). Considering that the food industry has experienced two large spikes in prices in the past ten years clearly shows that there are problems arising in the food industry, and they are only going to get worse and worse as the population rapidly increases. Several important world leaders are recognizing the importance of solving this crisis: " At a meeting of the Group of Eight (G8) industrial countries in 2009 the assembled leaders put food alongside the global financial crisis on their list of top priorities, promising to find \$20 billion for agriculture over three years. This year the current president of the Group of 20 (G20), France's Nicolas Sarkozy, wants to make food the top priority. The Gates Foundation, the world's richest charity, which had previously focused on health and development generally, started to concentrate more on feeding the world. At last month's World Economic Forum, a gathering of businesspeople and policymakers in Davos, 17 global companies launched what they described as ' a new vision for agriculture', promising to do more to promote markets for smallholders—a sign of rising alarm in the private sector. "(Parker, 2011). Clearly this issue is becoming more and more prevalent and governmental as well as private organizations are all focusing their efforts in the same direction, food security, or a lack thereof. The current methods of agriculture are clearly not getting the job done, and as new science and technology have been evolving in the agricultural world it is becoming that there are more productive, environmentally safe ways to produce our food globally. Cultivation of crops has been a prevalent practice worldwide for hundreds of years, but just how much land do we have available for cultivation? In developed countries such as the United States,

Australia, or Japan the amount of land needed for crop cultivation has leveled out as farmers have been able to find ways to yield more crops from the same amount of land. However, in developing countries in places such as Africa, they rely on expanding their land cultivation in order to have a larger food supply. They don't have the same growing technologies as we do, and their only method to increase production is simply expansion. This becomes a problem because globally we are running out of room for agricultural expansion. This forces crop cultivation into areas with less suited soil, and can cause great environmental damage to the ecosystems already in place. (Cassman, 2005) " Cultivation has affected the provision of other services in three ways: by conversion of biologically diverse natural grasslands, wetlands, and native forests into less diverse agroecosystems; by the choice of crop species grown and the pattern of cropping in time and space; and by the manner in which crops, soil, and water resources are managed at both plot and landscape levels"(Cassman, 2005). Although cultivation is necessary, it is important to realize the impact it has on the environmental ecosystems and ecosystem services that were there before. " The first Green Revolution—as developed in Mexico and then in South Asia in the 1960s—succeeded in improving yields in the breadbasket regions where it was implemented. 4 But it sometimes came at a high social and environmental cost, including the depletion of soils, pollution of groundwater, and increased inequalities among farmers. "(Schutter, 2011). This has created a desire for new structural agricultural design. This new design " must not only preserve land and other agricultural resources for future generations; it must actively restore lands and resources that have been degraded. "(Schutter, 2011). If

measures aren't taken now to reduce these environmental damages we may not have the option of growing and producing crops in the future. Climate change is already having serious impacts on agricultural production and the way we utilize agriculture as well as our food security. For example, " Rain patterns are shifting, leaving farmers unable to harvest mature crops. "(Schutter, 2011), also droughts and floods are becoming more common placing more stress on the reliability of agriculture. Water sources are becoming more exhausted and variable, which seriously affects agricultural productivity. (Schutter, 2011). It is projected that some areas will become less productive because of these climate changes, which will have a devastating impact on food demand. Additionally, another main problem in our current agriculture systems is that most of them heavily rely on fossil fuels, which are running out fast.(Schutter, 2011). " Our food relies on oil or gas at many stages: nitrogen fertilizers are made of natural gas, pesticides are made out of oil, agricultural machinery runs on oil, irrigation and modern food processing are highly energy-dependent, and food is transported over thousands of miles by road or air. "(Schutter, 2011). Water scarcity and land degradation are two other environmental projections that will cause many problems in the future of agriculture if we continue with the same agricultural systems we have been using and don't implement change. If time goes on and nothing changes, climate change will increase, the growing conditions for crops will only become worse and worse, leading to smaller and smaller crop yields, and more starving people.(agroecology). Recent research suggests that a way to improve productivity while maintaining environmental safety is through an agricultural method called agroecology.

Agroecology is the effort to mimic ecological processes in agriculture (Beall, 2012). The significance of this system is that it seeks to improve the entire ecological system, and not just the plant! Agroecology was based on five fundamental principles, “ (1) recycling biomass and balancing nutrient flow and availability; (2) securing favorable soil conditions for plant growth through enhanced organic matter; (3) minimizing losses of solar radiation, water, and nutrients by way of microclimate management, water harvesting, and soil cover; (4) enhancing biological and genetic diversification on cropland; and (5) enhancing beneficial biological interactions and minimizing the use of pesticides. ” (Schutter, 2011). Now that agroecologists have successfully implemented these principles they are looking to add food systems and agricultural systems into their scope of practice. (Schutter, 2011). Some of the principles included in agroecology entail using renewable resources and minimizing toxic products. It also means that you take measures to conserve: soil, water, energy, genetic resources and capital. Steps are also taken to manage ecological relationships by recycling nutrients and minimizing disturbances. Agroecology also aims to adjust to local environments, and diversify: landscapes, biota, and economics. Four of the main goals of agroecology are to empower people, manage whole systems, maximize long term benefits, and promote overall health for humans, animals, culture and environment. (agroecology). Essentially it practices sustainable agriculture that yields large crops, but doesn't ruin the land or the ecosystem services in the process. Now is agroecology successful when applied to agriculture practices? Yes it is extremely effective! Agroecologist systems have been implemented in many locations globally

and have had great results! “ The widest study ever conducted on these approaches, led by Jules Pretty of the University of Essex, identified 286 recent interventions of resource-conserving technologies in 57 developing countries covering a total area of 37 million hectares in 2006. 22 The average crop yield increase was 79 percent, and a full quarter of projects reported relative yields greater than 2. 0 (i. e., 100 percent increase). "(schutter, 2011). Amazing changes having being made in undeveloped countries such as Malawi allowing them to enrich the quality of life of their poorest people. (Schutter, 2011). “ Research shows that the program has increased yields from one ton per hectare to two to three tons per hectare, even if farmers cannot afford commercial nitrogen fertilizers. " Schutter, 2011). You don't even need the most expensive technology as long as you aim for sustainable production. Clearly these programs are effective and do what they were created to do, feed more people, while simultaneously being cautious and protecting the environment. They are much more environmentally friendly, and in some cases more productive then previous systems of agriculture. Some other ideas urge the use of farming on a smaller scale then the mass production methods we currently use for agriculture today. Proposing that if people grew their own personal gardens on their own land or locally it would allow for more diversity of crops and help add to the sustainability of agriculture while increasing biodiversity. “ It is only in the last one hundred years, and increasingly since 1945, that the large-scale production of food in monocultural systems has occurred and this has been mainly in developed countries. The majority of the world's farmers, particularly those in the tropical regions of the world, still depend for their

food and income, on multi-species agriculture (Geno & Geno, 2001).

"(foodforest). Scientists are discovering they may be onto something, " In an extensive literature survey, they found evidence to suggest that not only do polycultures yield more total production than monocultures, they do so with greater stability and lower risk. They cite numerous examples where different polyculture methods have been found to yield 10% to 100% more than monoculture methods. "(foodforest). It is clear to see that there are extensive benefits to implementing polycultural methods of farming in agriculture, and moving away from monocultural mass productions of our foods. Teaming agroecology techniques of farming with methods of farming on a smaller scale could produce positive outcomes on a large scale, even globally. These small scale " backyard" gardening methods would greatly enrich the biodiversity of ecosystems, allowing them to grow new varieties of plants and species. Enriching the biodiversity would benefit all people and animals living in the biosphere. " Backyard polyculture garden systems have potential to improve the productivity, stability, sustainability and autonomy of the human food supply in and around cities. "(Foodforest), overall increasing quality of life for the inhabitants! Some critics would argue that it is unrealistic to implement this much change on such a large scale, but we have to start somewhere. It will not be an easy change to make, but with the right cooperation a positive difference can be made. Some critics also would argue that the science behind agroecology might be skewed in order to work in the interest of the scientists behind it; but after the amount of research I have conducted on this topic the science strongly suggests that we are in a food crisis and one possible solution is redesigning our agricultural system to

make it more sustainable and productive. There will always be varying opinions on matters, but there is no argument that agroecology has been tested and that it has improved crop yields while being safer on the environment! This is a crucial time for our world, as our population increases we are facing problems that we have never had to deal with before, and needing to find new ways to feed our rapidly growing population. Agricultural methods we are currently using are heavily reliant on fossil fuels and not ideal as we are running out of space to increase agricultural cultivation. Using agroecology methods to redesign agricultural systems worldwide would greatly help reduce the damage being done to the environment by modern agriculture techniques as well as increase sustainability in agriculture worldwide. It is a very simple concept; if we take care of the soil and water better it will produce better crops, feeding more people. Methods of agroecology have been tested all over the world and have been proven effective. Also, plans of encouraging polycultural farming instead of monocultural farming would greatly improve biodiversity and allow for more sustainable life in cities! Implementing both of these changes together could greatly improve our agricultural systems, solving the food crisis. The next step is getting countries on board globally in making this change together to redesign the way we get our food. It might be difficult at first, but the long-term benefits greatly outweigh the initial costs. It is crucial that we make these changes now in order to assure food security for the soon to be 9 million people on earth! Resources: Beall, A., 2011. ESRP101 Online Lecture. WashingtonStateUniversity, PullmanWA. De Schutter, O. and Vanloqueren, G. 2011. The New Green Revolution: How Twenty-First-Century

Science Can Feed the World. Solutions. Vol 2, No. 4. pp. 33-44 - <http://www.thesolutionsjournal.com/node/971> Parker, J. 2011 A special report on feeding the world. The Economist Feb 24, 2011 Cassman, K. G. and Wood S. lead authors. 2005. Chapter 26 Cultivated Systems. Millennium Ecosystem Assessment. <http://www.maweb.org/en/Condition.aspx> Read pages 747-775 <http://foodforest.com.au/Agroecological%20analysis%20of%20a%20polyculture%20food%20garden%20on%20the%20Adelaide%20Plains.pdf> <http://www.agroecology.org/> <http://www.agroecology.wisc.edu/> <http://www.agroecology.wisc.edu/downloads/thompson.pdf>