

Brighter Green Submission on Agriculture to the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC)

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Brighter Green is a non-profit public policy action tank based in New York City that works to raise awareness of and encourage policy action on issues that span the environment, animals, and sustainability.

In response to the call from the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the United Nations Framework Convention on Climate Change (UNFCCC) for views on how to enhance the adaptation of agriculture to climate change impacts while promoting rural development, sustainable development and productivity of agricultural systems and food security in all countries, particularly in developing countries, Brighter Green submits its views.

New agricultural ideas and actions are essential amid rising climate stress, a growing human population, widespread degradation of ecosystems, and rampant food insecurity; nearly one billion people regularly don't get enough to eat. Pastoralists in Kenya, rice farmers in India, and industrial feedlot operators in the U.S. are all contending with increased frequency of drought and erratic weather.

This submission focuses on the need to support diverse, climate-resilient systems of agricultural production that enhance food security, promote equity, including for women, safeguard animal welfare, and avoid some of the pitfalls of the model of agriculture now common in industrialized countries that limit the possibility of adaptation. Too often, this system prioritizes production of livestock and feed crops at vast scales at the expense of plant-based alternatives.¹

It also incurs serious costs, to land, water, forests, and the global climate; public health; rural communities; animal welfare; and sustainable, equitable development. Crops like legumes, beans, many varieties of vegetables, fruit, and nuts can be more climate-adaptable and offer opportunities for sustainable livelihoods, carbon sequestration, and healthier diets. They can also lead to better stewardship of land, water, and biodiversity—all of which are under increased pressure from the effects of climate change.

Summary of key points:

- Production of meat, eggs, and dairy products is less sustainable than plant-based alternatives, using significantly more land and water and

¹ For example, in the U.S., less than 4 percent of farm acres grow vegetables, pulses (beans and legumes), fruit or tree nuts.

producing approximately one-fifth of anthropogenic greenhouse gas emissions (or as much as one half of the total).

- In adapting agricultural systems to climate change, particularly in developing regions, it is important to consider the many negative externalities of livestock; not only in terms of GHG emissions and sustainability, but also the long-term challenges posed to achieving food security, improving public health, and enhancing animal welfare.
- Merely adapting livestock production to climate change does not resolve livestock's inherent externalities, including GHG emissions, water and air pollution, land degradation, and deforestation, among others.
- The production of plant-based foods can be used to adapt to *and* mitigate climate change. Nitrogen-fixing legumes such as beans and lentils not only improve soil health, but also provide a sustainable protein source.
- Trees and intact forests have a crucial role in absorbing carbon, and preventing soil erosion and building soil health. Agroforestry, which integrates trees and cultivation of crops, has proven resilient to the effects of climate change. Even outside of agricultural systems, reforestation can act as a bulwark against many of the negative impacts of climate change, and a means of significant carbon sequestration.

Context for Recommendations

Since the 1970s, global meat production has grown nearly threefold—and it has increased 20 percent just since 2000. Each year, nearly 70 billion land animals are used in meat, egg, and dairy production around the world. If current trends continue, by 2050 the global livestock population could exceed 100 billion—more than 10 times the expected human population.

Industrial-scale livestock production has allowed producers to raise enormous numbers of animals. Yet these facilities are far more factory than farm. Animals—hundreds, thousands, or even tens of thousands in the case of chickens—are confined in small pens, cages, sheds, or stalls in indoor sheds. They have been almost wholly removed from the land: they lack access to pasture, the remains of the harvest, fresh air, and sunlight. Cows raised for beef may graze for some months, but they spend much of their lives in dirt “finishing” feedlots.

Advocates of factory farming argue that this form of agriculture is necessary if the world's population is to be fed. But a growing number of researchers—within civil society and policymaking bodies in Europe, the United States, and the United Nations, as well as in countries experiencing the “livestock revolution” now—argue the opposite: that this model risks creating worse ecological and climatic conditions, greater food insecurity, and poorer public health than it can remedy.

Intensification of animal agriculture means that “the livestock sector enters into

more and direct competition for scarce land, water, and other natural resources,” according to the Food and Agriculture Organization (FAO) of the United Nations.²

An inherent and troubling inefficiency exists. Between two and five times as much grain is required to realize the same number of calories through livestock as through grain eaten by people directly (and up to 10 times as much for industrially produced beef). Between 2011/12 and 2010/11, the proportion of world cereal production used in animal feed rose by 1.5 percent, a higher rise than for other uses of cereals, such direct consumption by people or to produce fuel.

Although factory farms and feedlots appear to use less land, since the animals are kept in confined areas, thereby avoiding obvious deforestation or soil erosion, their enormous feed requirements must be met by using other land. Increasing demand for grain and oil-meals to sustain the growing livestock population also means that more of the planet's surface will have to be converted to cropland to grow food for farmed animals; about 98 percent of soy meal is currently used as feed.

According to a 2009 UN report on water and development, shortfalls due to climate change, urbanization, population growth, and the needs of agriculture and food production pose significant challenges to continued rapid economic growth in coming decades across Asia. The U.N. report referred specifically to rising consumption in emerging economies of animal-based foods, are much more water-intensive than, according to the report, “the simpler diets they are replacing.” Each ton of beef requires 16,000 cubic meters (4.2 million gallons) of water.³

Country-Level Examples: Risks and Opportunities

Ethiopia

In Ethiopia, most domestic animals are still raised by small-scale farmers or pastoralists. However, industrial animal agriculture is present in the country. Intensive, factory-style facilities operate in Addis Ababa, as well as Debre Zeit and Nazret. Overgrazing of livestock and over-production of crops have degraded much of the country's range- and farmland, and Ethiopia has one of the world's highest rates of soil erosion. This makes growing food or grazing livestock more of a challenge, while diminished plant cover increases Ethiopia's vulnerability to drought and flash flooding.

² Henning Steinfeld, et al., “Livestock's Long Shadow: Environmental Issues and Options,” Food and Agriculture Organization of the United Nations. Rome: FAO, 2006.

³ “Water in a Changing World.” World Water Development Report, Third Edition. Paris: United Nations Educational, Scientific, and Cultural Organization, World Water Assessment Program, 2009.

As in many developing countries where agriculture is the economic mainstay, production of staple foods in Ethiopia is highly dependent on rain, not irrigation. This means significant fluctuations in harvests as climatic conditions shift.

In coming decades, Ethiopia, home to Africa's largest livestock population, may face a stark choice: use available water and land resources—already under considerable pressure from the effects of soil erosion, recurring drought, and deforestation—to grow food for human consumption or grain for cattle raised in feedlots and chickens in broiler and layer sheds.

Nitrogen-fixing legumes such as beans and lentils can help small farmers adapt to climate change and support food security. They not only act as natural fertilizers, trapping nitrogen from the atmosphere and depositing it into the soil, but they provide healthy protein, more food per acre than livestock, and can prevent soil erosion where grazing depletes soil.

A CGIAR partner research program is focusing on developing improved varieties of “grain legumes,” i.e., chickpea, lentil, soybean, pigeon pea, cowpea, and groundnut, among others, with the goal of increasing crop yields by 20 percent (a potential increase of 7 million metric tons of food). Such grain legumes are, according to CGIAR, often called “the meat of the poor” and represent an important source of protein for hundreds of millions of people. They also capture nitrogen and transfer it to soil, improving its fertility and reducing the need for chemical fertilizers.

Ethiopia's is Africa's largest chickpea producer and the harvest of the chickpeas grew by 15 percent between March 2010 and March 2012. Farmers in Ethiopia have been working with ICRISAT, CIAT, ICARDA, IITA and several other public and private organizations (including EMBRAPA from Brazil and ICAR from India) to increase the quality and use of legumes. In response to climate change, they are working on bean varieties that are tolerant to heat, drought, and low-phosphorous levels in soils.

Kenya

In Kenya, some Maasai pastoralists have been switching to cultivation agriculture as natural vegetation becomes too scarce to ensure sufficient grazing for their herds of livestock, one of the consequences of more frequent drought. Growing vegetables and securing markets to sell them has also provided an important alternate livelihood for a number of communities, and particularly for women.

Brazil

In Brazil, while most cattle are still free ranging, much of the pasture they graze on has been created in areas of great biological diversity, specifically in the Amazon rainforest and the Cerrado—the Brazilian savannah—both of which are enormously important to the global climate. In each ecosystem, millions of cattle now graze in near-treeless drylands, sometimes in sight of the receding forest or grassland horizon.

The Amazon and the Cerrado have also been centers of industrial-scale cultivation of soybeans. Large areas of former forest or savannah ecosystems are now demarcated by a patchwork of large, straight-edged fields, akin to those in the U.S. farm belt, and planted with row upon row of soybeans.

Emissions from agriculture have charted a rapid rise, increasing 41 percent between 1990 and 2005.²³ Cattle are a major factor. An estimate deemed conservative and carried out by Friends of the Earth-Amazonia (Amigos da Terra - Amazônia Brasileira), the Brazilian National Institute for Space Research (INPE), and the University of Brasília concluded that fully half of Brazil's GHG emissions between 2003 and 2008 came from the cattle sector. If all parts of the "cattle chain" had been included, the researchers add, the proportion of GHGs attributable to Brazil's cattle would have been even larger.

At the same time, the number of ecological and organic producers of food in Brazil is growing, providing an alternative, and possibly a rebuke, to industrial agriculture. In southern Brazil, the Rede Ecovida de Agroecologia (Ecovida Agroecology Network) links small-scale producers of vegetables, fruits, cereals, and animal-based foods practicing agroecology. Thousands of family farmers are in the network, as are cooperatives and NGOs. Farmers' products, stamped with an Ecovida label, are sold in Brazilian shops, as well as supermarkets and institutions, and some are exported.

ASPTA-Brazil, an NGO, works with agroecological producers throughout Brazil and raises awareness about the principles and impacts of agroecology. It also tracks the use of genetically modified soybeans and corn in Brazil.

India

India has a large and growing population of farmed animals and intensification in how they are produced, in the Western mold, is underway. India is now among the world's largest producers of milk, poultry meat, and eggs. Chicken production in India once relied on small, backyard flocks raised by individual farmers, many of them women. Today 90 percent of the more than 2 billion chickens in India that come to market each year are produced in industrial facilities.

A variety of vegetables is a well-known feature of Indian meals. But consumption of vegetables among Indians on average is not even one-third of recommended levels, and the amount of cropland used for vegetable production, less than 2 percent, is tiny compared to the size of the population.

Pulses, including lentils, peas, and beans, are also integral to India's varied cuisines, but rates of consumption are decreasing across all sectors of Indian society. One reason is steep price rises, as domestic production fails to keep pace with population growth. In addition, because of quick, large-scale production, particularly for chicken meat and eggs, no taxes, cash transactions, low waged labor, and few government regulations, animal products often sell in India for

less than vegetables or pulses.

In 1961, 69 grams of pulses were available for each Indian. By 2005, that level had fallen by more than half, to 32 grams. The non-governmental Nutrition Foundation of India would like to see the Indian government, researchers, and farmers collaborate to support increased domestic cultivation of pulses and remove obstacles to their reaching markets, with a particular focus on ensuring that poor Indians benefit.

Recommendations to SBSTA for the UNFCCC

The U.N. Environment Programme (UNEP), in assessing the impacts of how materials are produced and used, concludes that “more than fossil fuels, agricultural activities directly influence ecosystems by occupying large land areas and using huge quantities of water.” UNEP adds: “a substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products.”⁴ This will require a serious rethinking of agricultural and food systems. The SBSTA process provides an important arena for this to take place.

Given the foregoing data, examples, and analysis, Brighter Green recommends the following actions to facilitate the potential for countries to:

- Explore and implement alternatives to the industrial agricultural system that would be better for the climate, the environment, family farmers, and food and income equality. A shifting the locus of investment and policies away from monocultures (of livestock and crops) and toward non-industrial farmers and an array of produce cultivated using more sustainable agricultural practices (such as agroecology) would be essential. Systems of land tenure ought to promote protection of forests, grasslands, and other ecosystems—i.e., conservation for carbon sequestration.
- Adopt agricultural and development policies that focus on ensuring sustainable livelihoods—and food security—in both the short- and long-term rural regions.
- Provide incentives to promote cultivation of and ensure equitable access to foods that provide key nutrients, like leafy greens and pulses, which require less water than soybeans or feed grains and may be more resilient to the anticipated effects of climate change. Reviving and expanding cultivation of staple foods—those planted and harvested before the advent of commodity crops—could benefit the soil, improve diets by adding nutrient-dense foods, and increase household and even national agricultural income. Many vegetable species have shorter growing seasons than maize or wheat, and require less water. All such efforts should ensure

⁴ United Nations Environment Programme, International Panel for Sustainable Resource Management, *Assessing the Environmental Impacts of Consumption and Production: Priority Products and Materials*, Nairobi: UNEP, 2010.

the participation of women farmers on an equal basis with men. These measures do not have to consign farmers to operating at subsistence levels on small plots of land; they can include medium-sized enterprises and mechanisms for sharing agricultural risks and return, such as cooperatives.

- Collaborate with civil society and donor agencies on large-scale ecosystem restoration projects that would revitalize over-grazed and over-harvested lands and create new opportunities for increased production of nutritious food (as well as re-growth of forests and vegetation that help ensure stable rainfall patterns). Such restoration efforts could also create new jobs or livelihoods.
- Launch, with civil society—including environmental, food security, anti-poverty, small farmer, women’s, and animal welfare organizations—a serious, wide-ranging national and state-level dialogues on food production and food access, livestock, sustainability, and equity that would assist in conceiving and putting in place national and regional government policies. A forum like this could also help increase the public’s awareness of this complex and critical set of issues.
- Pass national law(s) on animal welfare that would end the abuses and cruelty inherent in factory-style production facilities and across the agriculture and food sectors. In many societies, such laws would reflect national cultural heritage and values that protected animals and habitats for generations, as well as constitutional provisions.

We greatly appreciate the opportunity to share our views on this subject of critical importance.

Sincerely,

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