Headline: Climate change, agriculture, and food security

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Recently 60 delegates from 22 Asian countries took part in a workshop organized by the United Nations in Manila to map out national adaptation plans or NAPs, which are the main vehicles of countries for climate change adaptation including accessing climate finance. This is quite significant in the wake of US President Donald Trump's withdrawal of America from the Paris Agreement, which binds countries to fight climate change and adapt to its effects, with enhanced support to assist developing countries to do so.

Sunlight, temperature and rainfall are the main drivers of crop production; hence, agriculture is directly affected by climate change. But it should also be noted that agriculture also affects climate change as it is responsible for about one-third of greenhouse gas emissions, a major cause of global warming. About 25 percent of carbon dioxide emissions are produced by human practices, mainly deforestation, use of fossil-fuel-based fertilizers, and burning of plant materials. Likewise, most of the methane in the atmosphere comes from livestock, forest fires, irrigated rice cultivation, and waste products.

Combating climate change is one of the biggest challenges facing humanity in the 21st century. The Intergovernmental Panel on Climate Change (IPCC) foresees that throughout the century, climate change impacts will slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing poverty traps and create new ones.

For major crops like rice, corn and wheat, climate change without adaptation is projected to reduce production when the temperature increases by 2 degrees Centigrade. All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability. Likewise, the IPCC reports that due to the sea-level rise projected throughout the century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion.

The UN recently projected that up to a quarter of global food production could be lost by 2050 due to the combined impact of climate change, land degradation and water scarcity. At the same time, the global population is projected to increase to about 9.5 billion. In the Philippines, the major impacts of climate change are sea-level rise due to rising temperatures; more frequent and intense floods; stronger and more frequent typhoons causing landslides and flooding of coastal areas; and longer and more intense droughts with more El Niño episodes.

In order to guarantee food security, agriculture must adapt to yield reductions from floods, droughts and rising temperatures, and at the same time address its contributions to climate change. Current agricultural practices require large amounts of oil to produce the chemical fertilizers necessary to grow crops, run the factories that process grain into packaged foods, and fuel trucks and airplanes to transport food across the world. This gives impetus to the generation and application of innovations generally dubbed as "climate-smart agriculture."

The Food and Agriculture Organization defines climate-smart agriculture as an approach that guides actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. According to the World Bank, climate-smart agriculture seeks to increase sustainable productivity, strengthen farmers' resilience, reduce agriculture's greenhouse gas emissions, and increase carbon sequestration. It strengthens

food security and delivers environmental benefits.

Climate-smart agriculture includes proven practices such as conservation agriculture, intercropping, crop rotation, integrated crop-livestock management, agroforestry, water management, better weather forecasting, more resilient food crops, and risk insurance.

In countries where the economy is heavily based on agriculture, such as the Philippines, modernizing agriculture is the most efficient poverty-reduction measure. Yet agricultural expansion for food production and economic development come at the expense of soil, water and biodiversity conflicting with other global and national goals.

Food insecurity is caused by a combination of factors resulting in dramatic increases in food price and food scarcity. The causes of food insecurity are multiple, but a major factor is climate change, most notably the adverse weather events that have diminished grain stocks and led to greater price uncertainty. These trends show no signs of abating, and it seems very likely that in the future, climate change will increasingly diminish food security and widen the gap between the rich and the poor. Preventing a deepening food crisis and lessening the potential for wider social and geopolitical unrest will require swift action and strong political will to reduce greenhouse gas emissions. It will also require policies to protect the millions of people facing poverty and hunger, and changes to agricultural practices worldwide.

Climate change is here, and the situation is urgent. Human activities are loading our atmosphere with heat-trapping gases. The disruption of our planet’s climate system is inflicting serious damage on human, animal, aquatic and plant life. Heat waves, forest fires, and floods are intensifying. The sea level is rising and will continue to do so in the future. The Philippines and the world need concerted action to widen the narrowing path toward climate change adaptation and mitigation for sustained food security.

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