

## **Philippine Agriculture 2020 and the Environment**

### **ENVIRONMENTAL CHANGES AND CONSEQUENCES OF AGRICULTURAL PRACTICES**

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May I express my thanks to the panel of experts that put together the PA 2020 for their kind invitation for me to give some comments on the chapter on Agriculture and the environment. While it is true that the threat of hunger cannot be as critical as it was in the days of green revolution, the continuing existence of poverty and the increasing number of poor people continue to challenge our development agenda. We are losing farmland due to urbanization and our watersheds due to deforestation. And certainly, these trends will affect the poor because agriculture is basically a spatial operation. Productive land is needed and if land becomes unproductive, the poor will not only be dispossessed of their lands but also they will also need to take new ways for livelihood for which they are usually unprepared.

Let us just take some indications of the scenarios that are being developed now as we practice agriculture. In many countries, the farmers no longer get water they need for irrigation. Several river systems in Asia including the Yellow River in China which a year ago could no longer reach the sea during dry season falling short by 600 km and the Mekong River last year dropped to its lowest level ever recorded. When we look at rice production, for example, FAO statistics show that Indian farmers are pumping more than 21 million tube wells of 1.059 trillion cubic feet of water or 30 cubic km of water is extracted every year by farmers. This amount of water which is pumped out is more than what is replaced by rain. Also, there is now good evidence that global warming has a potentially serious impact on crop yield. The United Nations' inter-governmental panel on climate change says that without drastic action to halt emission of greenhouse gases, there will be a rise of 3.6 °C degrees in average global temperatures in the coming century, and this will certainly affect the yields of other crops.

I congratulate the panel for putting the Millennium Ecosystems Framework as the basis, as a framework for looking at the agriculture and the environment. The Millennium Ecosystems Framework recognizes the strong linkage between ecosystems and human well-being. People are part of the ecosystems; human activity and natural forces influence and transform ecosystems, and environmental sustainability is an issue that permeates all of PA 2020. But having said that, we all have to remember that food has to be cheap and affordable and easily accessible. And those producing food, the farmers have to be remunerated for what they're doing and they have to earn and their farming has to be profitable. But we also know that agriculture comes at a cost always to the environment. Very eminent scientists have looked at this question and they tell us that agriculture comes at a cost to the environment and that agriculture will be a major driver of environmental change in the next 50 years. Furthermore, the importance of looking at the environmental factors, monitoring them and understanding them is advocated and suggested very strongly by Clarke. These are the consequences that are identified as we look at environmental changes and consequences of agricultural practices—loss of ecosystems services, ecosystems simplifications, nitrification and habitat destruction and species extinction.

Studies on global warming and the impact on crop yield indicate a 7% reduction in yield for rice with the present atmospheric CO<sub>2</sub> for every 1 °C rise in current mean temperature and a regression analysis suggesting a 17% decrease in both maize and soybean yields for each 1 degree centigrade increase in growing season temperature for the period that was extended from 1982 to 1998 in the United States. So what we see here is human activity—economic, physical, social, political, exacerbates natural geological climatic changes that have impact on the environment and there is very strong evidence to show that climate change affects crop yield. But we also know that the performance and survival of plants and animals are affected, influenced by the interactions of their genes with the environment. The expression of genes maybe enhanced or inhibited by stimuli from environment and a biodiversity strategy needs to be adopted so we can manage the interaction between the gene and its environment.

Inputs and cultural management practices as we all know affect the integrity of the environment and natural resource management must now include a good understanding of the scientific basis of sustainability which unfortunately at this point in time is still very weak. When we talk about sustainable practices, we really find it difficult to translate it into specific

practices. But we now have new tools in science that will allow us to monitor and understand what is happening in the very complex situation such as the environment. These new tools include the: ability to perform high-capacity, high-speed computing, the ability to use modern biotechnology and understand genomics, ability to measure parameters in the environment using rapid high through-put chemometric methods, and in the social sciences—more and more techniques and methods have been generated for impact assessment. Integrated resource management is an important tool to control primarily water, soil, green house gases and the biodiversity parameters that are present in a farming system. But integrated natural resource management will not be effective unless you also manage the human population.

And as a last point, I would just like to put forward the idea of ecological forecasting which we will call global warning. We should use these tools in understanding the environment in order to put up an early warning system so that we can prevent further deterioration of the environment to its irreversible limits.

As a political statement, it is very important and it is a very pivotal portion of agriculture and environment agenda that a national land use plan be adopted immediately so that we can stop land guzzling which are not well thought out. It is the opinion of many experts that we may just have enough to feed the present population in the world with the present amount of land. If we expand further we will be endangering a lot of other aspects of our lives.

And finally just a food for thought, “there is no simple law of nature that makes technology the cause of economic growth or growth because of technological advance, it is always the interplay of people, economic institutions, growing markets and technology” and I say this because managing the environment and making farming profitable is going to be a very complex task and a very difficult task for all of us to undertake. Thank you.

