Rural Development and Food Security Forum 2019 – List of Resources
Session 4: ADB Knowledge Sharing and Experience on Climate Change, Gender Equity, High-Level Technology, and Natural Resources Management

The session showcases some of ADB's innovative projects and highlights the lessons learned so that other countries may consider adopting similar approaches and designs for their projects.

Title and Link	Overview
1. Sustainable Land Management in Asia Introducing the Landscape Approach	The Asian Development Bank has introduced significant changes in the way farmers and other stakeholders view and benefit from evolving approaches to sustainable land management (SLM) practices. Firmly embedded in SLM are the management and climate resilience of natural resources, which can be enhanced and scaled up by adopting a "landscape approach." This publication sets out how the landscape approach can contribute to overcoming major environmental and developmental challenges—focusing on rural areas of Asia and by examining prevalent forms of SLM (namely participatory forest management, terraces, conservation agriculture, and home gardens). This publication seeks to strengthen awareness of the landscape approach and facilitate the integration of its key elements into cooperation programs with its developing members.
2. Mapping the world's degraded lands	Degraded lands have often been suggested as a solution to issues of land scarcity and as an ideal way to meet mounting global demands for agricultural goods, but their locations and conditions are not well known. Four approaches have been used to assess degraded lands at the global scale: expert opinion, satellite observation, biophysical models, and taking inventory of abandoned agricultural lands. We review prominent databases and methodologies used to estimate the area of degraded land, translate these data into a common framework for comparison, and highlight reasons for discrepancies between the numbers. Global estimates of total degraded area vary from less than 1 billion ha to over 6 billion ha, with equally wide disagreement in their spatial distribution. The risk of overestimating the availability and productive potential of these areas is severe, as it may divert

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	attention from efforts to reduce food and agricultural waste or the demand for land-intensive commodities.
3. Carbon dioxide (CO2) levels this century will alter the protein, micronutrients, and vitamin content of rice grains with potential health consequences for the poorest rice-dependent countries	Abstract: Declines of protein and minerals essential for humans, including iron and zinc, have been reported for crops in response to rising atmospheric carbon dioxide concentration, [CO2]. For the current century, estimates of the potential human health impact of these declines range from 138 million to 1.4 billion, depending on the nutrient. However, changes in plant-based vitamin content in response to [CO2] have not been elucidated. Inclusion of vitamin information would substantially improve estimates of health risks. Among crop species, rice is the primary food source for more than 2 billion people. We used multiyear, multilocation in situ FACE (free-air CO2 enrichment) experiments for 18 genetically diverse rice lines, including Japonica, Indica, and hybrids currently grown throughout Asia. We report for the first time the integrated nutritional impact of those changes (protein, micronutrients, and vitamins) for the 10 countries that consume the most rice as part of their daily caloric supply. Whereas our results confirm the declines in protein, iron, and zinc, we also find consistent declines in vitamins B1, B2, B5, and B9 and, conversely, an increase in vitamin E. A strong correlation between the impacts of elevated [CO2] on vitamin content based on the molecular fraction of nitrogen within the vitamin was observed. Finally, potential health risks associated with anticipated CO2-induced deficits of protein, minerals, and vitamins in rice were correlated to the lowest overall gross domestic product per capita for the highest rice-consuming countries, suggesting potential consequences for a global population of approximately 600 million.