

## Facing the Inevitable: Impact of Climate Change on Nutrition Security

Jacob Kumaresan\* and Sadhani Rajapakse

World Health Organization Country Representative to Sri Lanka (Former), No 05, Anderson Road, Colombo 05, Sri Lanka

\*Corresponding author: Jacob Kumaresan, World Health Organization Country Representative to Sri Lanka (Former), No 05, Anderson Road, Colombo 05, Sri Lanka, Tel: +1914 659 8022; E-mail: jacobkumaresan@yahoo.com

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### Case Report

The Millennium Development Goals (2000-2015) established a precedent for the global leaders to tackle the world's pressing issues such as poverty, hunger and malnutrition [1]. Despite the significant progress on the MDGs, today there are 795 million undernourished people of whom 90 million are children under age five [1]. Children are most vulnerable and high mortality rates are seen in situations where prevalence of acute malnutrition among children is 10-15% and severe malnutrition is between 2-3% [2]. Malnutrition is a serious public health concern that is exacerbated during a famine when food supplies are depleted causing acute food shortage. A 'Nutrition Emergency' occurs when there is a risk of or an actual increase in mortality due to acute malnutrition.

Climate change is a hunger risk multiplier that exacerbates existing vulnerabilities, including 20% more people at risk of hunger by affecting availability, access and utilization of food [3]. Its impact is predicted to increase rates of malnutrition in children by about one fifth by mid-century (2050) [4]. A study in the Pacific by Asian Development Bank (ADB) on the projected yield reductions of major staple crops resulting from climate change revealed large effects with serious reduction in cassava yields that are projected by 2050 (Table 1). The impact on Papua New Guinea and Solomon Islands is significant (30% and 28% reduction) as cassava is the staple food for the poor. The population at risk of hunger is expected to more than double in Papua New Guinea and triple in Solomon Islands by 2050 when compared with data from 2000 [5]. Without climate change, the number of malnourished children under 5 years would have decreased in both these countries by 2050; however, climate change will result in 26% and 11% increase in the numbers respectively [6].

	Year	Papua New Guinea	Solomon Islands
Cassava Yields % reduction by 2050		30	28
Population at Risk of Hunger ('000)	2000	1275	45
	2050 (no CC)	2156	114
	2050 (CC)	2616	165
Population of Malnourished Children under Age 5 ('000)	2000	172	9
	2050 (no CC)	138	6
	2050 (CC)	217	10
CC = Climate Change			

Table 1: A study in the Pacific by Asian development bank.

As a factor that has immense consequences on agricultural productivity, climate change has intensified the existing threats to food security, nutrition and livelihoods [7]. Climate change plays a significant role in increasing the frequency and intensity of climate hazards, diminishing agricultural yields, escalating health and sanitation risks, increasing water scarcity, and intensifying conflicts over scarce resources. Its impact will manifest unevenly, affecting the populations that are most at risk of hunger [3]. The effect of climate change on agriculture has major cascading effects on national economies as well. For example, sub-Saharan African countries suffered about USD 31 billion in crop and livestock production losses due to droughts that occurred between 1991 and 2013 [8]. As a result, food accessibility reduces, increasing food prices making it difficult to purchase food, and contributing to malnutrition [3]. With the unabated rise in greenhouse gas emissions, deforestation and resource overexploitation accelerating climate change, resulting in altered ecosystems, rising sea levels and extreme weather conditions, there is a severe impact on food and nutrition security which requires urgent attention by the global community [1].

Climate change-related threats should be addressed with nutrition-sensitive adaptation and mitigation measures. Countries need to invest in nutrition-smart initiatives, increase policy coherence, and institutional and inter-sectoral collaboration [4]. Proactive adaptation policies and investments may include focusing on agricultural research to develop more drought- and heat-resistant crop varieties, use moisture-conserving tillage methods, improve irrigation efficiency and encouraging urban farming, both as a source of nutrition security for households and a buffer during disaster periods [9,10]. These will require new technologies for reclamation of degraded agricultural land, and management of soil and water resources. Properly designed and targeted Social Safety Net programs can play a crucial role in breaking the vicious cycle of poverty and food unavailability and ensure nutrition security for affected communities [5]. Safety Net programs can be efficient if beneficiaries such as pregnant women, or lactating mothers and their children are targeted [4]. Improving smallholder production also has a tremendous impact on nutrition security as it increases both the food supply and household income [5].

In the long term, emphasis on education will play a significant role in achieving nutrition security. For instance, investing in mother's nutritional knowledge is important for household food allocation and children's nutritional status [11]. Countries need to respond to global nutrition crises in a coordinated manner and comprehensively assess the impact of new policies and actions in order to avoid those that may have undesirable consequences for other countries and international food markets [12]. The international community needs to strengthen cross-border cooperation for emergency support and better management of international food markets.

Even though the path ahead is challenging, doing nothing is not an option. Investment in the knowledge base required for location-specific adaptations will enable communities to achieve food and nutrition security in line with the 2015 Sustainable Development Goals (SDGs) supported by the United Nations Framework Convention on Climate Change [13].

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