



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Sustainable Development of Bangladesh Agriculture: Examples for Strategies to Adapt to a Changing Environment

SATTAR MANDAL¹, AD SPIJKERS², NICOLE WRAGE³, JENS GEBAUER³, FLORIAN WICHERN³

¹*Bangladesh Planning Commission, Agriculture, Water Resources & Rural Institutions Division, Bangladesh*

²*Former FAO Representative to Bangladesh, The Netherlands*

³*Rhine-Waal University of Applied Sciences, Life Sciences, Germany*

Abstract

Geo-morphological conditions shaped by interfaces of two contrasting environments - the Himalayas to the north and the Bay of Bengal to the south - make Bangladesh one of the most vulnerable countries to climate change. Flash floods, cyclones, storm surges in the south and water scarcity with droughts in the northern regions are frequent. The rise of average air temperature already affects growth of winter vegetables and wheat. Reduced and erratic precipitation limits rain-fed cropping and reduces groundwater recharge, consequently counteracting further development of tubewell irrigation for rice production. Frequent unpredicted floods submerge crops. Besides storm surges, sea level rise causes salt water intrusion further reducing arable land, fresh water availability and biodiversity in the southern regions. Environmental changes have aggravated already stressful low productive farming of crops, animal husbandry and fish culture. These manifold stressors to agriculture and rural development, which add on to population growth and urbanisation, are very pronounced in Bangladesh. Indeed, Bangladesh can act as a model country to develop climate adaptation strategies, which can be applied elsewhere.

To create potential research demands, three examples of adaptation practices in smallholder farming systems are proposed. The first example elucidates the contribution of private sector led irrigation water market to dry season Boro rice production, which improved national food security. Here, future challenges lie in improving water and nutrient use efficiency, counteracting soil salinity and finding alternative engine fuel. The second example illustrates soil fertility management, which increases soil health through improved soil organic matter management and balanced fertilisation to enhance resilience of cropping systems (*e.g.* against soil salinity). Thirdly, homestead gardening is at the core of adaptation strategies as it provides household nutrition from diverse field crops, fruits and vegetables as well as timber and non-timber forest products. The homestead production systems do also supplement family income and significantly buffer food price fluctuations. This diversity however is threatened by climate change variables. Future research therefore will focus on investigating the effect of transformation processes on biodiversity and sustainability of smallholder agriculture.

Keywords: Biodiversity, climate adaptation strategies, homegardens, irrigation, nutrient use efficiency, smallholder farming, soil salinity