Crop adaptation to enhance food security to Mitigate the climate change impact in draught prone areas for proliferation of unsustainability

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Abstract

World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100 [1]. This is a huge challenge with limited farming land which is continually threaten by different extreme events of climate chan ge. Given that smallholder farmers are frequently food insecure and rely significantly on rain-fed agriculture, it is critical to examine climate variability and food insecurity [2]. A projected consequence of climate change is the decrease of farmland and crop production [3,4,5] in established agricultural regions due to more irregular and extreme weather throughout the cropping season [6,7]. There are on going research to maximize the landuse to adapt the need to ensure the food security. Cliamte change is reducing the land out of farming. Tropical and sub-tropical regions may suffer different levels of lost arable land. For example, South America may lose 1–21% of its arable land area, Africa 1–18%, Europe 11–17%, and India 2–4% [8]. This is impacting heavily in the areas where GDP is poor and people live there life without a limited alternatives. Ensuring food security in the northern part of Bangladesh becomes a great challenge due to occurrence of frequent drought and its impact on the crop production practices. Despite the impressive achievement in development of drought tolerant crop varieties, large-scale extension, adaptability and impact of these technologies at farmer's field to overcome food insecurity remains a great challage. This study examines the transferability and adaptability of BUdhan1 (staple cereal in bangladesh) and its effect on food security status among the farmers of Gaibandha district where case study is performed. Primary data were collected through questionnaire survey of randomly selected 60 households' heads. Adoption quotient was measured to reveal the status of extension whereas perceived benefit of BUdhan1 was analyzed to measure the technological factors of BUdhan1 adoption. Moreover, chi-square test was used to determine the effect on food security status. Findings revel that BUdhan1 has been moderately transferred to the northern farmers although found economically profitable (BCR= 1.42) and technologically sound. The study found that a 1% level of adoption of BUdhan1 by the respondents can lead to a 0.45% reduction of food insecurity status. It is suggested that GO and NGOs should take immediate steps to disseminate BUdhan1 to bring the uncultivated areas under intensive cultivation as well as to ensure sustainable food and livelihood security of the northern people.

Key words: *drought tolerant rice variety, adoption quotient, contingency co-efficient, food security and sustainability.*