Abstract

Cropping System Intensification for Increasing Crop Productivity in Salt-Affected Coastal Zones of Bangladesh [†]

Rina Rani Saha ^{1,*}, Md. Alimur Rahman ², Md. Hafijur Rahman ³, Mohammed Mainuddin ⁴, Richard Bell ⁵ and Don S. Gaydon ⁶

¹ Bangladesh Agricultural Research Institute (BARI), Gazipur-1701, Bangladesh; saharinarani@yahoo.com

² Regional Agricultural Research Station (RARS), BARI, Barishal 8211, Bangladesh; alimurbd@yahoo.com

³ Regional Agricultural Research Station (RARS), BARI, Jashore 7403, Bangladesh;

hafijrahman05@gmail.com

⁴ CSIRO Land and Water, Canberra, ACT 2601, Australia; Mohammed.Mainuddin@csiro.au

⁵ Sustainable Land Management, School of Veterinary and Life Sciences, Murdoch University, Perth WA-6150, Australia; r.bell@murdoch.edu.au

⁶ CSIRO Agriculture and Food, Brisbane, QLD 4067, Australia; Don.Gaydon@csiro.au

* Correspondence: saharinarani@yahoo.com

[†] Presented at the third International Tropical Agriculture Conference (TROPAG 2019), Brisbane, Australia, 11–13 November 2019.

Published: 7 April 2020

Abstract: In Global Climate Risk Index 2019, Bangladesh has been ranked seventh among the countries most affected by extreme weather events. The salinity intrusion has increased by 27% from 1973 to 2009 in coastal areas of Bangladesh due to impacts of climate change. The cropping intensities of the coastal zones are below than the country's average intensity (195%), which causes severe food insecurity. In southern coastal zone, soil and water (river/canal) salinity remain the minimum (<4 dS/m) during in July/August but attain the maximum (upto 11 and 25 dS/m, respectively) in March/April. Farmers grow single T.aman rice a year. Therefore, five cropping patterns were tested under ACIAR funded project in Amtali (Barguna district) and Dacope (Khulna) upazilas during 2016–2017 and 2017–2018 irrigating with low salinity surface water (canal/pond) to increase crop productivity. In Amtali, T.aman-Potato-Mungbean-T.aus cropping pattern gave the highest (20.18 t/ha) rice equivalent yield (REY), which increased 360% REY over the farmers' practice (T.aman-fallow-fallow). However, in Dacope, T.aman-spinach-fallow showed the highest REY (13.99 t/ha) that increased 211% REY compared to farmers' practice. The improved cropping patterns can be practiced within the polder (embankment for water control) for increasing crop productivity and profitability in salt-affected coastal zones of Bangladesh.

Keywords: cropping system intensification; crop productivity; salt-affected coastal zone; Bangladesh

© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).