Tropentag, September 15-17, 2021, hybrid conference

"Towards shifting paradigms in agriculture
for a healthy and sustainable future"

Salinity Constraints and their Implications for Smallholder Farming in North-aceh, Indonesia

Elvira Sari Dewi, Issaka Abdulai, Gennady Bracho-Mujica, Reimund P. Rötter

University of Göettingen/Universitas Malikussaleh, Department of Crop Sciences: Tropical Plant Production and Agricultural Systems Modelling (TROPAGS), Germany

Abstract

Smallholder farmers in Indonesia's coastal lowlands continue to face climate-related challenges threatening their livelihoods such as increased salinity on agricultural land. We investigated the effects of salinity on farming practices, income, and challenges perceived for crop production in the Blang Nibong village in North Aceh. Indonesia. We conducted a survey of 120 smallholder farmers chosen in consultation with local leaders, considering their agricultural activities and susceptibility to salinity. Open and closed questions were formulated to assess farmers' perception of major crop production constraints (e.g. salinity, intra- and inter-annual variability of rainfall and temperatures), and potential adaptation strategies to better cope with these constraints. The study reveals that for decades, farmers in the study region have primarily grown rain-fed rice using traditional monoculture techniques. Results also indicate that all farmers (respondents) perceived salinity as the primary crop production constraint leading to plant mortality, decreased soil health and water quality, limited plant growth, and low yields. Farmers have also indicated that the high interannual variability in the duration and amount of growing season rainfall remains a major constraint for crop production in the region. Additionally, an area that can be cultivated is also relatively limited (> 0.5 ha), resulting in low total production. Thus, results from the survey also show the implications reflected in farmers' income. In fact, farming activities are not contributing positively to farmers' income, and off-farm activities generate the greatest proportion of income. Based on farmer's efforts to overcome the salinity problem on their farms, the surveyed households were divided into adaptive and non-adaptive farmers. The option preferred by the non-adaptive group is to convert their land to pasture (81 %) while the adaptive group would rather prefer the strategy of improving the irrigation system (77 %) to be implemented. Other strategies mentioned, but with low interest by farmers, include integration of crops and livestock, grow salt-tolerant rice cultivars, diversification of crop rotations, improvement of soil quality, and maintenance of land cover.

Keywords: Adaptation strategies, farmer's perception, lowland coastal farming, salinity constraints, salinity risks

Contact Address: Elvira Sari Dewi, University of Göettingen/Universitas Malikussaleh, Department of Crop Sciences: Tropical Plant Production and Agricultural Systems Modelling (TROPAGS), Grisebachstraße 6, 37077 Göttingen, Germany, e-mail: elvira@unimal.ac.id