World Academy of Science, Engineering and Technology
International Journal of Biological and Ecological Engineering
Vol:10, No:05, 2016

Livelihood Security and Mitigating Climate Changes in the Barind Tract of Bangladesh through Agroforestry Systems

Authors : Md Shafiqul Bari, Md Shafiqul Islam Sikdar

Abstract : This paper summarizes the current knowledge on Agroforestry practices in the Barind tract of Bangladesh. The part of greater Rajshahi, Dinajpur, Rangpur and Bogra district of Bangladesh is geographically identified as the Barind tract. The hard red soil of these areas is very significant in comparison to that of the other parts of the country. A typical dry climate with comparatively high temperature prevails in the Barind area. Scanty rainfall and excessive extraction of groundwater have created an alarming situation among the Barind people and others about irrigation to the rice field. In addition, the situation may cause an adverse impact on the people whose livelihood largely depends on agriculture. The groundwater table has been declined by at least 10 to 15 meters in some areas of the Barind tract during the last 20 years. Due to absent of forestland in the Barind tract, the soil organic carbon content can decrease more rapidly because of the higher rate of decomposition. The Barind soils are largely carbon depleted but can be brought back to carbon-carrying capacity by bringing under suitable Agroforestry systems. Agroforestry has tremendous potential for carbon sequestration not only in above C biomass but also root C biomass in deeper soil depths. Agroforestry systems habitually conserve soil organic carbon and maintain a great natural nutrient pool. Cultivation of trees with arable crops under Agroforestry systems help in improving soil organic carbon content and sequestration carbon, particularly in the highly degraded Barind lands. Agroforestry systems are a way of securing the growth of cash crops that may constitute an alternative source of income in moments of crisis. Besides being a source of fuel wood, a greater presence of trees in cropping system contributes to decreasing temperatures and to increasing rainfall, thus contrasting the negative environmental impact of climate changes. In order to fulfill the objectives of this study, two experiments were conducted. The first experiment was survey on the impact of existing agroforestry system on the livelihood security in the Barind tract of Bangladesh and the second one was the role of agroforestry system on the improvement of soil properties in a multilayered coconut orchard. Agroforestry systems have been generated a lot of employment opportunities in the Barind area. More crops mean involvement of more people in various activities like involvements in dairying, sericulture, apiculture and additional associated agro-based interventions. Successful adoption of Agroforestry practices in the Barind area has shown that the Agroforestry practitioners of this area were very sound positioned economically, and had added social status too. However, from the findings of the present study, it may be concluded that the majority rural farmers of the Barind tract of Bangladesh had a very good knowledge and medium extension contact related to agroforestry production system. It was also observed that 85 per cent farmers followed agroforestry production system and received benefits to a higher extent. Again, from the research study on orchard based mutistoried agroforestry cropping system, it was evident that there was an important effect of agroforestry cropping systems on the improvement of soil chemical properties. As a result, the agroforestry systems may be helpful to attain the development objectives and preserve the biosphere core.

Keywords : agroforestry systems, Barind tract, carbon sequestration, climate changes
Conference Title : ICEBE 2016 : International Conference on Ecology, Biodiversity and Environment
Conference Location : Berlin, Germany
Conference Dates : May 19-20, 2016