

Farmers' Level of Knowledge, Environmental Concerns and Agricultural Biodiversity Conservation: A Randomised Control Method Application

Pallewela, Janaka; PG Dip. in Health Development, Masters of Development Practice, PhD candidate in Health Economics, Medical Doctor, Health Department, Sri Lanka, drjanakas@gmail.com

Agricultural biodiversity is a sub-set of general biodiversity which is essential for global food production, livelihood security, environmental protection and sustainable agricultural development (FAO, 2007). Some direct benefits that farmers can receive from maintaining a diverse farming system can be given as follows. First, a diverse farming system minimises external risk that farmers often face. For example, if a farmer has both crops and livestock this will minimise the risk from drought or water shortage. That is, while crops can be devastated, the farmer still can derive an income from livestock. Second, high levels of agricultural biodiversity provide fresh nutritional foods for their families. Third, a diverse farming system can help farm families to utilise family labour optimally (Brookfield et al. 2002). For example, different crops may require labour in different time periods and family labour can easily be distributed among different crops and/or livestock in order to obtain maximum benefits. Fourth, agricultural biodiversity is found to have positive impacts on overall productivity and soil quality (Karunaratna, 2013).

In addition to providing direct benefits to farmers, agricultural biodiversity improves ecological processes by regulating climate, maintaining soil quality, providing protection from erosion, storing nutrients and breaking down pollution (Di Falco and Chavas, 2009). Despite all these benefits previous experience has shown that population growth, inequity, inadequate economic policies and institutional systems have mainly contributed towards the increasing loss of agricultural biodiversity in the world. Low levels of knowledge and lack of integrated research on natural ecosystems and their innumerable components may exaggerate the process, especially in developing countries.

The study attempted to investigate the role of farmers' knowledge of biodiversity and their environmental concerns on conserving agricultural biodiversity in diverse farming systems in Sri Lanka. It analysed how farmers' valuation of agricultural biodiversity changes with the change of their knowledge on agricultural biodiversity and their environmental concerns. Choice Modelling was combined with the Randomized Control Method(RCM) to collect field data and Conditional and Random Parameter Logit models were used to analyse the data. In RCM firstly, 21 villages from Ampara district were selected purposively. Then the villages were divided into three groups (one control groups and two treatment groups) randomly. Accordingly, randomisation to select households into different groups (two treatment and the control) was done at the village level and 'village' is the unit of randomisation in this study. Then a number of 20 farmers was selected from each village randomly(using the farmers' list). The survey involved several steps. First, households for the survey from the district were selected. Second, based line survey was carried out covering all three groups. The main purpose

of this survey is to understand their knowledge and environmental attitudes on biodiversity and test whether there is any significant spillover effects among the respondents. This survey includes a set of simple questions related to agricultural biodiversity and environment concerns. Third, one treatment group was educated using a formal educational program on agricultural biodiversity designed for this study while other treatment group was provided information in order to improve their environmental concerns. Control group is not provided any information. Finally, CE survey covers all groups in the district. The questionnaire used for this study was developed using the results from six focus groups' discussions and a pre-test.

Education program included two steps. Firstly, we met respondents of two control groups and explained the importance of agricultural biodiversity or environmental protection individually. Secondly, we provided leaflets (but not keep with them-they can read it in front of us or we can read it for them) showing the importance of maintaining diverse farming system in their farms or the importance of protecting environment. Final survey was carried out by administering a questionnaire through a face-to-face interview with the Head or any other working member of the households. The final survey covered 420 households.

In general, the findings of the choice experiment support the assumption that diverse farms and their multiple attributes contribute positively and significantly to the utility of farm families in Sri Lanka. Also their valuation of agricultural biodiversity is highly affected by their knowledge on biodiversity and environmental attitudes. It is evident that farmers' level of knowledge as well as environmental concerns play a major role in the conservation of the agricultural biodiversity. The overall findings of this study will enable policy makers to implement relevant policies to further reduce the degradation of agricultural biodiversity that is increasingly posing a major impediment to agricultural production, environmental protection and sustainable development.