Innovative land and water management for sustainable productivity in hillside watersheds of Rwanda

Azene Bekele-Tesemma, Azene.Bekele@cgiar.org

ABSTRACT

Changes in demography and climate now pose a serious threat on present agricultural systems in agrarian Africa. More variability in precipitation, increased impact from flooding in soil and nutrient loss, changes in soil acidity discourage farming life. This is often worse in countries of rugged topographies such as Ethiopia and Rwanda who depend on hillside agriculture. To protect agricultural areas intensified in hillsides, adapting innovative and tailored land management systems has become essential.

To prescribe the innovative land and water mangement technologies, watersheds were categorized first by agroclimatic zones that are in congruence with agroclimatic zones developed for Eastern and southern Africa. Ten agroclimatic zones were identified for the entire Rwanda. Under each agroclimatic zone, a number of land-sensitivity classes were identified by considering the composite effects of slope, soil depth, and soil fertility variables which are generated from ground survey. For each of the watersheds that are situated in the different agroclimatic zones, the prevailing land-sensitivity classes were identified and mapped by using GIS software. Up to a maximum of 18 land-sensitivity classes were identified.

A number of technically and socially-fit innovative land and water mangement technologies and landuse options were prepared in consideration of local knowledge, school thoughts and experience from elsewhere. Almost always, rural land and water mangement facilitators who have been familiar with the farmers have been trained and made to lead in the identification of possible options in full participation with the farmers who also own the land. Finally, the refined innovative technologies and landuse options were presented to the landowners/land users for their final approval and planning the implementation. The necessary tools and equipments as well as the necessary land management inputs that are necessary for implementing the technologies were identified and quantified. Framers were organized into land-husbandry self-help groups and trained for sustainable and continued land-husbandry.

After practical training on how to use the tools and equipments, and apply the inputs, farmer-driven and expert-guided implementations were made at watershed scale. Always, illustrated site-development plan maps were provided to the land-husbandry self-help groups to be used as a guide. Trained senior-level experts were deployed to serve as knowledge-house and provide back-up as necessary.

After supervised-implementation, impacts have been continuously monitored by recording social and physical information. First, the baseline data was obtained using the same form and data-sheet. The same kind of information is being obtained season.

Already, very encouraging results are being obtained. Depending on the type of agroclimatic zone and land-sensitivity-class, productivity has increased from one fold to two fold. Flooding is totally avoided.   Moisture availability is lengthened by up to two more weeks compared to un-treated lands. Fertility is improved significantly. Lime application has shown improvement in PH adjustment level. Biodiversity has increased significantly especially in land-sensitivity classes that are put under ecosystem restoration. More than anything, farmers' culture in group formation and self-governance for continued and improved land-husbandry and reporting is created.