

REAPPRAISAL OF LAND AND WATER CONSERVATION FARMING IN  
SLOPE UPLAND AREAS FOR SUSTAINABLE AGRICULTURE  
IN INDONESIA

AGUS HERMAWAN<sup>1,2</sup>, SHAHBAZ MUSHTAQ<sup>2</sup>, MOHSIN HAFEEZ<sup>2</sup>

*ABSTRACT*

In Indonesia, about 45 percent of land is located on slope and hilly areas with elevation ranges from 350 to 1500 meter above sea level. Along the time, population growth compels farmers to cultivate in steep slope upland by replacing native vegetation to annual crops with less soil conservation consideration. In hilly areas, the high intensity of rainfall volume (>1500 mm/year), which falls in certain months has resulted land slides and erosion in this areas. As consequences, upland productivity and economic viability tends to decrease, in addition to soil erosion and land degradation. In fact, the soil erosion has not only impacted negatively to upland farmers' welfare but also created wider negative externality, reducing the lowland agricultural production. Soil erosion caused sedimentation in rivers, dams and water canals system, which in turn significantly reduced their capacity and caused severe flood and drought in rainy and dry seasons.

Adoption of suitable land and water conservation farming in the upland, therefore, would have significant effect for the whole catchment. Land and water conservation practices would assist in decreasing land slides intensities and frequencies, and maintain soil erosion and land degradation rate below tolerable level. Overall, it would increase social welfare by increasing the income of the farmers in the hilly areas and reducing third party impact in lowland agricultural production.

We proposed an integrated catchment management approach, which links the key components of land and water conservation together in a holistic way to sustain agriculture production both in the upland and lowland areas. An integrated approach toward water and land conservations is ideal when undertaking externality issues, which might not be solved without the involvement all of the parties. The proposed

---

1 Visiting Scientist of CSIRO Land and Water, Wagga Wagga and currently is a scientist researcher of Assessment Institute for Agricultural Technologies (AIAT) Central Java – Indonesia, email: ags\_hermawan@yahoo.com

2 Scientist researchers of International Centre of Water for Food Security, Charles Sturt University (CSU), Wagga Wagga, NSW, Australia

land and water conservation approach combines mechanical and vegetative conservations techniques. Under this, combinations of annual and perennial crops are proposed, which is based on land slope, soil depth, and soil erodibility. However, it is important to note that conservation farming technologies should consider socio-economic farmer conditions, especially direct benefit of in-site farmer either in short or in long period of time.

Key words: conservation farming, sloping upland, sustainable agriculture