Adoption of soil and water conservation practices under different farming systems in the Sahel region of northern Mali

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Climate change remains a major development challenge in developing countries, particularly in the Sub Saharan African economies. A study was conducted to assess the adoption of SWC practices under three farming systems (rice, cereals and mixed based) in the northern region of Mali. Data was collected from 297 farmer households, 16 NGOs and 11 focus group discussions in 11 villages. Results indicated that SWC measures are the most critical entry points for improving land resource resilience and agricultural productivity. At least one SWC practice was implemented by more than half of the farmers in the studied villages. However, the rate of adoption of the individual measures is generally low. Zai was the most common practice (43%), and the likelihood of adoption of any of the other SWC measures is less than 25%. Significant variation was observed among the three farming systems in the adoption of most of the SWC measures. About 69% of farmers residing in the mixed farming system used Zai compared to 34% (cereal) and 32% (rice). About 35% of farmers in the mixed system used ponds relative to 16% of the users in the cereals system. The most common constraints to SWC noted by farmers were lack of finance (29.5%) and limited labor (28%). The low uptake of SWC measures may hamper farmer households from achieving sustainable resilience to climate change. Inclusive strategies that include the use of improved crop varieties, integrated soil fertility management practices, credit schemes, and agro-meteorological forecasts in the extension and advisory services are recommended.

Effect of plastic film mulching and nitrogen on N_2O emission in dryland maize

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Understanding the response of N_2O emission to plastic film mulching is beneficial for improving management practices. We performed field experiments from 2014 to 2015 in northwestern China to measure the annual N_2Oemissions using the static chamber technique: plastic film mulching maize or no-mulching maize at different N levels (0 kg ha-1,100kg ha-1, 250 kg ha-1, and 400 kg ha-1). Compared to the no-mulching treatment, plastic film mulching markedly improved the soil temperature and moisture, which significantly increased the maize yields and N uptake, but did not increase the N_2O emissions. As a result, the yield-scaled N_2O emissions were markedly reduced in the plastic film mulching maize. However, the rate of N_2O emissions at different growth stages was affected by mulching. For the plastic film mulching treatment, N_2O emissions mainly concentrated in VE-V10 stage while it mainly concentrated in V10-R6 stage for no-mulching maize field.