Conservation Agriculture Adoption Among Smallholder Farmers Case Study of Madagascar

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Madagascar is an agricultural country in which nearly 80% of the population is rural, involved in agriculture, essentially in rice production. Soil degradation is known to be severe caused by the hilly type of topography, by an aggressive climate, by the repeated effects of bush fires, by the occurrence of long dry season and the overgrazing due the lack of pastures. Conservation agriculture (CA) has been introduced in the main rice producing areas of Madagascar (i) to increase smallholders farmers’ income and (ii) to protect natural resources. Total area under CA is now about 7,000 ha with roughly 10,000 smallholders farmers in the main agro-ecological zones according to records at national level. Almost all CA diffusion has been donor oriented and targeted at watershed and irrigation infrastructure for protection.

CA adoption has been driven by (i) availability of rice cultivation, (ii) soil restoration and fertility management and (iii) forage for livestock. So, as rice being the staple food, farmers are mainly interested in rice based cropping systems. Unlike many African countries, Malagasy farmers are used to practice crops rotations, therefore, this was an opportunity to introduce legumes to improve soil fertility. The most important CA systems adopted by farmers in relatively good fertility soils are the association of maize with legumes\(^1\) followed in the following season by rice. On poorer soils farmers are using the association of food crops (groundnut, Bambara bean…) with \textit{Stylosanthes guianensis} cv CIAT 184\(^2\) in rotation the following season with rice. One of the major drivers of CA is the occurrence of \textit{Striga asiatica} in some part of the Country and this was an entry point for CA extension. Also, among the reasons for CA adoption are the possibilities for farmers to grow upland rice in the hillside (known as \textit{tanety}) after regeneration of the soil with a good biomass, and to associate fodder crops (\textit{Brachiaria sp}) with staple food crops such as cassava.

Yield and profitability of CA plots are increasing with the number of years under CA, but saving in labor is not always consistently observed because of increasing labor due to

\(^{1}\textit{Dolicos lablab}, \textit{Vigna unguiculata}, \textit{Vigna umbellata}\)

\(^{2}\text{CIAT 184 is resistant to the main disease of Stylosanthes, the Anthracnose disease.}\)
weeding or cover crops management. It is also observed that a high proportion of farmers abandon CA after one or two years due to strong constraints of social, financial and structural aspects. The adoption tends to stabilize after 4 years of practice with stabilization of incomes and experiential learning of the farmers. Even though, it is doubtful if farmers will continue without support especially at an early stage of adoption because of the “knowledge intensive” of CA practices and high prices and low availability of inputs at farm gates.