

CHAPTER 3: DETERMINING FACTORS IN UP-SCALING TECHNOLOGIES AND INNOVATIVE SYSTEMS

3.1 ADOPTION OF CONSERVATION AGRICULTURE IN LAOS A CASE STUDY IN THE MEKONG CORRIDOR

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Abstract

Southern Sayaboury province has long been at the forefront of rural economic development in the Lao PDR. Over the past twenty years, livelihoods have undergone drastic changes and agriculture has become increasingly linked to the demand of the Thai market. At the same time, similar to the 1970s agrarian transition in northern Thailand, agricultural systems have shifted from traditional shifting cultivation systems based on fallowing, slash-and-burn and crop rotations, to more intensive systems based on heavy mechanized tillage, pesticides and hybrid seeds. Responding to substantial demand from local traders, smallholders have engaged massively in maize monocropping and have rapidly generated large profits. As a result, the area planted to maize in southern Sayaboury province has expanded rapidly to cover more than 42,000 ha, i.e., more than 88% of the total rainfed area cultivated in 2008.

Although livelihoods have certainly been improved in the short term, in the longer term, this dual process of agricultural intensification and expansion can have very negative social and ecological impacts, including increased soil erosion (leading to the destruction of roads and siltation of paddy fields), gradual soil exhaustion, chemical pollution of soils and hydrological systems, and increased risk of human intoxication by pesticides. In the light of these various threats, and since 2003, the National Agro-Ecology Programme (PRONAE) of Laos has been developing and adapting direct seeding mulch-based cropping (DMC) systems through a participatory approach involving village communities and farmer groups. Since 2006, and based on PRONAE's research results, the PASS-PCADR project – a rural development project active in the 4 southern districts of Sayaboury province – has been disseminating DMC systems on a larger scale.

Between 2005 and 2008, extensive surveys were carried out in order to: (1) assess the socio economic outcomes of DMC systems on a household level, (2) estimate the level of dissemination of DMC systems on a community level, and (3) determine the factors conditioning smallholder adoption or rejection of DMC systems. Surveys were carried out by the PRONAE programme in 4 villages (462 smallholders) and the PASS-PCADR project in 21 villages (2,160 smallholders).

The results of these surveys show that there are currently more than 1,200 smallholders using DMC systems on a total of about 1,500 ha of cultivated land. Overall, the rates and levels of DMC system adoption by smallholders appear to be greater in areas where the environment is most degraded and/or particularly fragile. With significant levels of crop diversification and

engagement in off-farm or non-farm activities, livelihoods in general appear more diversified in these areas. These trends can be considered as 'risk avoidance' strategies. By adopting DMC systems, smallholders attempt to avoid the environmental and economic risks associated with less sustainable systems based on heavy mechanization and maize monocropping. In turn, by diversifying their livelihoods, smallholders attempt to limit their vulnerability to the potential failure of a single economic activity. In contrast, in less environmentally-degraded and less fragile areas, the level of DMC system adoption is still rather limited. With more productive soils, mechanized monocropping can still provide high profits and, as such, retains the interest of a majority of farmers.

Although on-farm experimentation has shown positive technical and economic results, DMC system dissemination faces many technical and socio-economic constraints. For instance, whilst no-till agriculture can certainly reduce production costs (hence, contribute to improving the livelihoods of poor households), the credit and collection systems that have developed in southern Sayaboury province continue to favour conventional, mechanized agriculture and prevent farmers from adopting technical alternatives (i.e. crop rotation and diversification). Lack of access to appropriate agricultural equipment also prevents farmers from adopting DMC systems. Finally, poor communal land management (i.e. wildfires and grazing in the dry season) often leads to the destruction of both crop residues and cover crops used in DMC systems.