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Agronomy
Crops and cropping systems



▲ Direct seeding of maize on harvest residue mulch in small-scale mechanized farming conditions. Xayaboury province, Laos.

DMC adoption in developing countries

DMC techniques have mainly been adopted over the last three decades in South and North America and Australia, where they have emerged independently from national research and extension systems. These technical changes are harder to implement in developing countries because of the nature of most of their agricultural enterprises: small farms, subsistence strategies, limited risk-taking, limited resources, and the role of community exchanges. In these situations, the strategy should thus be to enhance potential adopters' access to other forms of capital (land, financial, human/social) in addition to technical capital, along with interventions in the spatial and economic environment of farms—land management and commodity chains.

The example of Alaotra Lake, the main area of DMC adoption in Madagascar, is interesting for several reasons. Almost 1 500 farmers are currently implementing DMC in an area of 1 200 ha. The adopted systems incorporate local crops at different intensification levels, which can be adjusted according to farmers' capacities and objectives. Farmers' organizations are structured and have gradually been interacting with different

stakeholders involved in agricultural production: microfinance institutions, banks, private operators, decentralized local authorities, and NGOs. In Laos, family farms differ by the fact that they are closely connected to the private sector—especially marketing and service supply companies. Because of this specific feature, a short-term development approach, combining regional/territorial with commodity chains levels, is possible. In the province of Xayaboury, where there is high pressure on natural resources (increased demand for raw materials from Thai agroindustries), over 1 600 farms currently implement DMC in a total area of around 2 000 ha.

Innovation processes observed in these two settings are specific responses to farmers' 'risk management' strategies. They indicate that it is possible, with a tailored method, to foster sustainable adoption of DMCs on low-resource family farms.

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- *ex-ante* assessment of territorial consequences of individual changes, and analysis of relationships between farms and stakeholders involved at different global organization levels (catchments, etc.)
- evaluation and development of farm advice and support systems and methods.

Three research issues are investigated: production management and choices of combinations of activities (agricultural or not) on farms; sociotechnical production method transformation processes; and stakeholder coordination processes.

The research is conducted in several areas:

- France: viticulture (Languedoc-Roussillon) and rice-based cereal cropping systems (Camargue)
- West Africa (Madagascar), North Africa and Brazil: rice cropping systems and mixed cropping-livestock systems (especially dairy production)
- African cotton-growing regions: agropastoral systems
- humid tropics (Africa and Central America): agroforestry systems.

SPACTO places emphasis on certain types of innovation: (i) conservation agriculture (France,

Brazil), integrated protection (viticulture, France) and organic agriculture (grapevine and cereals, France); (ii) enhancement of crop-livestock relationships on farm and territorial scales (Brazil, West Africa, Madagascar), (iii) and species associations (agroforestry in Africa and Central America, grapevine and cereals in France).

The team collaborates with farmers and farmers' organizations, research and teaching teams in industrialized and developing countries, development institutions, private operators, NGOs and donors. ...