Farming systems throughout the Lao PDR have changed drastically over the last 15 years due to a range of factors. In areas where market forces are prevalent, shifting cultivation systems have given way to more high-input agricultural systems. In southern Xayabury in the Mekong corridor, where there is access to the Thai market, the dual process of agricultural intensification (with the current plough-based maize mono-cropping systems) and expansion has had rather negative ecological impacts, including increased soil erosion (leading to destruction of roads and siltation of lowland paddy fields) and gradual soil exhaustion. Along with significant consequences for soil erosion and soil fertility, the transition has also brought about an increased use of pesticides which leads to chemical pollution. The objective of the poster is to give an overview of the holistic research approach implemented by NAFRI (National Agriculture and Forestry Research Institute of Lao PDR) and CIRAD since 2003 and of the iterative process of generating direct seeding mulch-based cropping (DMC) systems with smallholders. This approach, based on knowledge of local farming systems and environmental conditions is composed of five components: i) initial assessment, ii) setting up medium-term experimental units where conventional systems are continuously compared with DMC systems, iii) adaptation by smallholders groups of DMC systems, iv) permanent training for farmers, extension agents and information provision to policy makers, v) follow-up and analysis of the conditions of extension and adoption by farmers.