# Challenges to Operationalise Agricultural Innovation Systems: A Mexican Case Study

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## Abstract

Sustainable agricultural intensification is required to meet the growing demand worldwide for food, feed and energy, especially in the face of climate change. Proposed agricultural innovations include a range of technologies and management practices. However, farmer adoption rates have been low because of the i) complexity of technologies and management practices; ii) complex interplay between technologies, farming systems and local contexts; and iii) linear approaches to knowledge transfer. In response, extension approaches based on agricultural innovation systems are becoming increasingly popular. Despite this, little is known about the most effective pathways to operationalize these systems within short timeframes.

This paper uses the Mexican Sustainable Modernisation of Traditional Agriculture (MasAgro) programme as a case study to analyse the challenges to operationalising agricultural innovation systems. We outline the relationship between Mexico's extension approaches and global trends in technological change. We then analyse how MasAgro's innovation networks are operationalized. Thirdly, we identify ways to efficiently target in innovation networks, using a case-study from the state of Chiapas. Finally, we draw lessons from MasAgro´s innovation systems. This research is based on a comprehensive literature review, three years´ field observations, and 648 interviews with farmers and key stakeholders.

Mexico has continuously changed its extension approaches following global trends. To date, a variety of different extension modalities exist. MasAgro's innovation networks grew from small networks in a couple of regions to a national initiative. At that level, the innovation networks struggled to become fully institutionalized and operational, creating frictions with short evaluation timeframes of politicians. Identifying key change agents and efficient targeting became a problem with the fast network expansion; applying network analysis has proven helpful to improve this. Adjustments in the operationalisation approach were necessary given the diverse agro-ecological, socio-economic and political contexts; however this reduced resources to institutionalise joint learning. The Mexican experience shows that operationalising agricultural innovation networks requires already major efforts

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on a small scale but to do this on a larger scale within a few years, organisational and institutional learning capacities need to develop much faster and require more support than expected by all major network actors and brokers.