

## **Integrated systems approach for enhancing resilience of arid farming systems in South Asia**

Shalander Kumar\*<sup>1</sup>, Tej K Bhati<sup>1</sup>, Anthony Whitbread <sup>1</sup>

<sup>1</sup> International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Patancheru 502 324, INDIA Email: [k.shalander@cgiar.org](mailto:k.shalander@cgiar.org); [bhatitej@gmail.com](mailto:bhatitej@gmail.com); [a.whitbread@cgiar.org](mailto:a.whitbread@cgiar.org);

### **Abstract**

This paper aims to share the methods and processes of designing resilient farming systems to improve livelihoods under the drylands in South-Asia. The study is based on 250 randomly selected farm households along the rainfall gradient from Jodhpur- Barmer-Jaisalmer districts in Western Rajasthan in India. Our analysis demonstrates that the dryland smallholder farming systems occur within diverse agro-ecological and socio-economic environments and develop different livelihood strategies driven by opportunities and constraints encountered. Multiple livelihood assets determine different land use patterns and agricultural management practices in dryland systems in south Asia. Well-designed household survey on socio-economic and agro-ecological variables and statistical approach helped capture the diversity of livelihood assets to categorize households into homogenous farm types. The follow up FDG's with farmers and stakeholder were equally important to validate farm typologies and prioritization of interventions. Engaging the innovation platform for identification of potential innovation options and their prioritization at district level; involving farmers for each farm typology, and ex-ante assessment of promising options led to the on-farm assessment of farm type specific most appropriate interventions in the action villages. Landscape and community level options were prioritized with the village development committee and proactive farmers. The institutional platforms experimented at village to regional level has strengthened the capacity of the community/stakeholders to innovate to improve the farming systems resilience and economic viability. An ex-post assessment demonstrates significant increase in farming systems productivity, household income and development of value chains as well as sustainable management of natural resource including common pastures. This study contributes to the understanding of how research for development through integrated systems approach can contribute towards stabilizing farm incomes, sustainable intensification and smoothening livelihood of resource poor farmers in vulnerable dry regions.