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## Charting agroecological pathways: Multicriteria priority mapping for India’s sustainable transition

ALOK SIKKA<sup>1</sup>, GOPAL KUMAR<sup>1</sup>, ABHIJIT BEHERA<sup>1</sup>, SUDHARSAN MALAIAPPAN<sup>1</sup>, SMITHA KRISHNAN<sup>2</sup>

<sup>1</sup>*International Water Management Institute (IWMI), India*

<sup>2</sup>*The Alliance of Bioversity International & CIAT, Multifunctional Landscapes, India*

### Abstract

The coexistence of intensive cultivation in certain regions and rainfed, impoverished agriculture in others has not only failed to ensure adequate and balanced nutrition for a significant portion of the population but also engendered sustainability challenges. Particularly vulnerable are women and children, who disproportionately suffer from malnutrition. Amidst efforts to transition towards agroecology, observations have been varied, with some regions experiencing intended benefits while others find it challenging food security concerns. Despite substantial strides towards agroecological transition, India, as the world’s most populous nation with limited land and natural resources, can’t afford to lose focus on food security. Although natural farming practices promoted by the APCNF (Andhra Pradesh Community Natural Farming) have shown promise, their adoption has not reached desired levels. Insufficient knowledge base and incoherence between the natural farming movement and the national challenges and goals are the reasons. Consequently, a strategic approach to agroecological transition is imperative, necessitating the mapping of the regions, commodity and farming system based on multiple criteria aligned with national priorities and challenges. To delineate priority areas, commodities, and farming systems for the transition to agroecology, land use/land cover, land productivity, fertiliser consumption, rainfall distribution, groundwater availability, irrigation status, biomass and bioresource availability, soil organic carbon, and air temperature were used. Weightage for these parameters and sub-parameters was determined using the Analytical Hierarchy Process. The regions were categorised into three priority classes: high priority, medium priority, low priority for preparation of the priority maps. Additionally, factors such as farmer willingness, knowledge gaps, policy and programme support, local motivators, institutional structures, and governance will be incorporated, contingent upon data availability and compatibility. Ultimately, the mapping of priority areas and farming systems, in collaboration with stakeholders across the food system, will be pivotal for the successful transition to agroecology and its integration into the national policy framework.

**Keywords:** Agroecology, climate adaptation, digital agriculture, natural farming, priority mapping, resilience strategies