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Competing pathways for equitable food systems transformation: trade-offs and synergies

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Practising agroecology strengthens farmers' perceived ability to cope with climate change

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Integrating agroecological practices into farming systems can improve farming systems' resilience, but reported effects vary across geographies and production systems. Enhancing the resilience of farming systems by introducing new agroecological practices comes with positive and negative tradeoffs. Farmers' decision to adopt new agroecological practices or additional agroecological practices is driven by factors such as other resource availability and/or return on investment. In addition, farmer decisions are sometimes driven by motivational factors rather than return on investment. We hypothesise that farmers' awareness about their ability to cope with climate change is correlated with the number of agroecological practices followed by farmers. To assess the farmers' perception of their ability to cope with climate change and which agroecological practices they followed, we surveyed 3038 farmers in rural regions of Chad, India, Niger, and Tanzania. Survey questions were standardised in preliminary focused group discussions with farmers and other stakeholders. Individual interviews were conducted with the respondents chosen through systematic sampling, irrespective of their farming practices or other demographic factors. Correlations between agroecological practices, gender, and the farmers' perspectives on climate change were investigated using the FactoMineR package in R. The share of female farmers' participation in the survey was 50.0 %. Prevalent production systems in the regions are rainfed and organic by default. Thus, most farmers mentioned a change in rainfall patterns as the most challenging adverse climate change in past years, followed by more disease incidences, increased temperatures, and droughts. Crop rotation, Intercropping, mulching, and crop diversification are the leading agroecological practices for farmers in the regions. About 70 % of farmers in the regions perceive that they cannot cope with climate change. Farmers' perception of their ability to cope with climate change strongly correlates with the number of agroecological practices they follow. On average,

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the perceived ability to cope with climate change was high for the farmers who practised one more agroecological practice than fellow farmers. This signifies the importance of integrating agroecological practices into farming systems to enhance their ability to cope with climate change. More country and gender-segregated results will be present to help site-specific decisions making by practitioners and policymakers.

Keywords: Agroecology, biophysical and socio-economic factors, climate change