

EGU21-6748, updated on 12 Jun 2021

<https://doi.org/10.5194/egusphere-egu21-6748>

EGU General Assembly 2021

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Agricultural diversification and food security in low- and middle-income countries: Where is the evidence?

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Diversity and diversification in agricultural systems are often presented in the literature as having multiple benefits such as enhancing resilience, increasing food production and decreasing risks in production systems and is often postulated to benefit food and nutrition security in low- and middle-income countries. Our study aims to provide an overview of the potential for agricultural diversification to improve food security status as reported in recently published research articles analysing the diversity-food security relationship. We consider results for different scales, from individual to global and for different food security dimensions: availability, access, stability and utilisation.

We carried out a literature review that includes exhaustive, comprehensive searching. We search for peer-reviewed publications in the Web of Science core collection (v.5.32) written in English, between 2010 and February 2020 on the association between diversity in agricultural systems and at least one dimension or measure of food security. From the original list of articles we exclude all publications that (1) focus on a study area outside a low- to middle income country; (2) do not include at least one metric of farm-, regional-, or global-level diversity as specified with the search terms; (3) do not explicitly measure at least one food security dimension, or (4) were exclusively focussed on describing drivers and trends in diversity or food security.

We find that a total number of 87 research articles assessed a total of 328 diversity-food security relationships using one or more statistical modelling approach. About half of them are positive (54%) and mostly refer to the diversity-food access relationship on the individual, household and farm scale as this was the food security dimension and spatial scale most analysed. Of all results for food access 60% were positive relationships and only 4% were negative relationships with the remainder having no or ambiguous relationships. Twenty-nine studies used household dietary

diversity as a measure of food access and 10 studies used at least one food access indicator that is a validated proxy for nutrient adequacy. Positive relationships were more often reported for food availability (65%) than for food utilisation (33%) also because for food utilisation there are a lot of mixed findings for different measures of anthropometric and nutritional status. The most common spatial scale assessed was the household and farm scale (58%).

There is no food security dimension that primarily has a negative relationship with agricultural diversity but there is a considerable number of relationships that are found to be neutral or ambiguous. Diversity can be an important driver of food security, but the magnitude of the contribution depends on the socio-economic and biophysical characteristics of the local farming system. We conclude that farmers mostly see diversification as a potential strategy to improve livelihoods, agricultural production and/or food and nutrition security where other strategies are more expensive but not as a desirable characteristic of the agricultural systems at all costs especially in the presence of other strategies that can achieve the same outcome.