# Food Systems and Nutrition Evidence Gap Map

## Update #2 (July 2021 – Jan 2022)

## Highlights

- We added 82 studies to the map. Several of them covered already well-studied interventions, like peer support and counsellors (n=16), classes (n=8), and supplement use or provision (n=10)
- In the past, consumer behaviour was the least studied domain; however, in this update, it has the same number of new studies as the food supply chain domain (n=32 each) and more than the food environment (n=20)
- Four studies (5 per cent) evaluated national or transnational level policies, mostly in China (n=3). This is a shift from 9 per cent in the original EGM.
- Five completed studies and three protocols address previously identified gaps: women's empowerment (n=3), governmental manipulations of price (n=1), and measures of diet insufficiency (n=4).
- There continues to be a reduction in the reliance on experimental designs from 80 per cent to 67 per cent.
- The country focus largely returned to that of the original map, with the most commonly considered countries being India (n=11), followed by China (n=9), and Iran (n=7)
- The map will be updated again in August 2022. It can be accessed here. The original EGM report is available here.

**Table 1: Studies added to the EGM**

| Interventions | Studies and protocols added (studies previously included) |
|---|---|
| Total studies | 82 (2090) |
| Food supply | 32 (913) |
| Food environment | 20 (738) |
| Consumer behaviour | 32 (587) |
| Common multi-component | 3 (98) |
| **Previously identified gaps** | |
| *Illustrative list of interventions to priorities for evaluation* | |
| Government manipulations of price | 1 (23) |
| Advertising and labelling regulations | 0 (3) |
| On-farm, post-harvest processing | 0 (4) |
| Interventions to support food packaging | 0 (9) |
| Efforts to support women's empowerment within the food system | 0 (21) |
| Innovative store design | 0 (5) |

| Interventions | Studies and protocols added (studies previously included) |
|---|---|
| *Illustrative list of outcomes to priorities for evaluation* | |
| Women's empowerment | 3 (46) |
| Economic, social, and political stability | 0 (3) |
| Food loss | 0 (3) |
| Environmental impacts of the food system | 0 (3) |
| Measures of diet insufficiency | 4 (28) |
| *Illustrative list of evidence synthesis priorities* | |
| Provision of free or reduced-cost farm inputs to crop production | 0 (9) |
| Educational approaches within the food value chain | 0 (8) |
| Agricultural insurance products | 0 (1) |
| Outcome related to other diet quality and adequacy measures | 0 (24) |

## Background

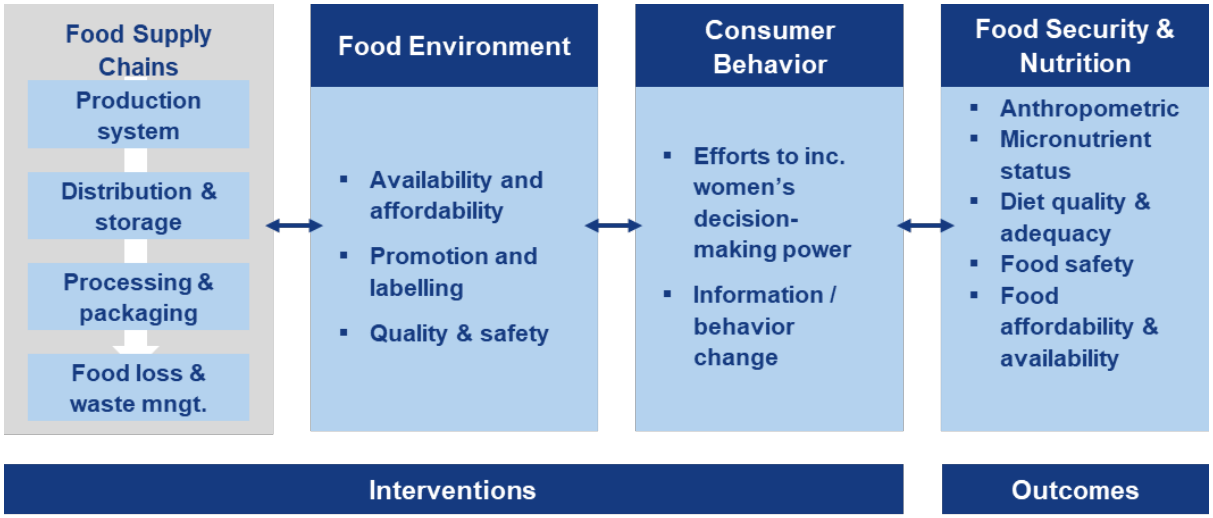
At the end of 2021, we witnessed two seminal events on the state of food security and nutrition worldwide: the global UN Food Systems Summit and the Nutrition for Growth Summit. The global community continues to grapple with the issue of how to transform food systems so that we achieve healthy diets for a growing global population within planetary boundaries (1, 2). A major lesson from these events was that we need to know what works, for whom, and at what cost in order to ensure that limited resources are used as effectively as possible.

This has been a longstanding need. In early 2021, with support from the GIZ “Knowledge for Nutrition” programme, 3ie completed an Evidence Gap Map (EGM) on food systems and nutrition. The EGM presents all impact evaluations and systematic reviews of interventions in low- and middle-income countries (LMIC) that function within food systems and measure outcomes related to food security and nutrition. The EGM has the dual purpose of serving as a collection of the available evidence and a representation of the research topics where additional work is needed. In both functions, the EGM acts as a global public good to inform the efficient allocation of resources. It makes existing evidence more easily available to decision-makers, funders, and researchers.

The EGM uses an adapted version of the framework from the High-Level Panel of Experts on Food Security and Nutrition (HLPE) from 2017 to conceptualise the food system, separating it into the three dimensions (i) food supply chain, (ii) food environment, and (iii) consumer behaviour (Figure 1) (3). With over 1,800 impact evaluations and 170 systematic reviews included, the original EGM was 3ie’s largest to date. However, the evidence base is rapidly expanding. To ensure that the EGM remains a useful and current tool, we developed it into a living EGM. What this means in practice is that we continuously monitor newly published studies, adding them to the EGM as they are identified. In doing so it ensures that

the most recent research remains available to stakeholders and keeps them up to date on the latest evidence. This report presents our analysis of the studies published from July 2021 to January 2022 and discusses changes in the evidence base over this period.

**Figure 1: Conceptual framework and theory of change for the Food Systems and Nutrition Evidence Gap Map**




**Source:** 3ie (2020). Adapted from HLPE (2017).

## Methods

### Search strategy

To populate this EGM, we drew from three sets of searches. First, we re-ran the searches in the original EGM. The search strings used and the databases searched were identical to those in the original EGM, with the exception of correcting a syntax error in the strings for one database (Scopus). Second, we also re-searched grey literature sources included in the original EGM. This additional search was not run previously, so it includes all articles published on grey literature websites sources since September 2020. Third, we screened items retrieved in the searches for 3ie's Development Evidence Portal—a database of impact evaluations and systematic reviews across sectors in international development—for relevance to this EGM. Monthly "evidence surveillance" searches are used to populate the Development Evidence Portal. As there is considerable overlap in the inclusion criteria for the Portal and this EGM, pooling these search strategies reduces overall workload and allows more articles to be screened. However, because no studies returned from the Portal search and not the EGM search were ultimately included in the first update, we do not expect that this pooling of the search results affected the number of studies identified.

The EGM-specific searches were run in October 2021 and January 2022, covering the period since the previous searches in July 2021. Relevant studies from these searches are included in the present update. For the next update, we will present studies added to

academic bibliographic databases starting from February 2022. Further updates will be published every four months through March 2023.

### Screening

The same process for screening was employed in this update as in the original EGM. Records retrieved through the searches were uploaded into the EPPI-Reviewer 4 software. An automated process within the software was applied to remove duplicates. We applied a machine learning classifier, developed during the original EGM, to these search results, and screened those abstracts with a priority score of 30% or above. We also applied a classifier developed with Development Evidence Portal screening data to the EGM search results and screened those scoring 30% or above.

Title and abstracts of all imported, deduplicated, and adequality prioritized studies were screened by a single consultant against inclusion/exclusion criteria. If screeners were uncertain about inclusion, the study was screened by a senior reviewer.

The full texts of studies that met title and abstract criteria were screened by a single consultant using the same approach of providing an “unsure” option for screeners to flag papers for screening by a senior reviewer. All consultants conducting full text screening had conducted screening for the original EGM.

### Data extraction, analysis, and presentation of results

Data extraction and analysis procedures were identical to those of the original EGM. Results are presented graphically on the 3ie interactive online platform. This report presents updated figures, illustrating the evolution of the evidence base.

## Results

Our search retrieved 86,282 records (Figure 2). We removed 43,719 duplicates. We also removed 19,236 records which were identified as having low probability based on the classifier in EPPI-Reviewer 4. Therefore, 23,327 abstracts were screened. During title and abstract screening, 22,104 articles were excluded, leaving 1,223 to be screened at full text. An additional 122 grey literature sources were also screened at full text. Finally, 91 relevant articles were eligible for inclusion, nine of which were linked to other articles and did not represent unique studies. Therefore, we added 82 unique studies: 79 impact evaluations, two completed systematic reviews, and one systematic review protocol. Nine studies included at full text were from the grey literature search. Of the 82 included studies, 27 reports were published before 2021 but added to the databases searched in a delayed manner. The remainder of the newly included studies were published in 2021 and 2022.

Most of the new studies focused on consumer behaviour (n=32) or the food supply chain (Figure 3, n=32), specifically the production system (n=28). Many of the studies within the food supply chain related to education (n=16) and the provision of agricultural inputs

(n=12).Well-studied interventions from previous work continue to be the focus with 16 new studies on peer support and counsellors (138 previously included in the EGM), eight new studies on classes regarding consumer behaviour (251 previously included), and 10 new studies on the provision or use of supplements (371 previously included). Four new studies considered the impacts of a national-level policies. One evaluated an Indonesian agricultural extension program (Rokhani et al.). The others (n=3) were conducted in China and assessed food safety regulations, water-saving irrigation promotion, and governmental consumer price manipulations (Sun Dongsheng et al., Yang & Gao, Su et al.). The study on governmental manipulation of price considered a minimum price procurement scheme for grain. No other new studies considered interventions that we had previously identified as representing meaningful evidence gaps.

**Figure 2: PRISMA**

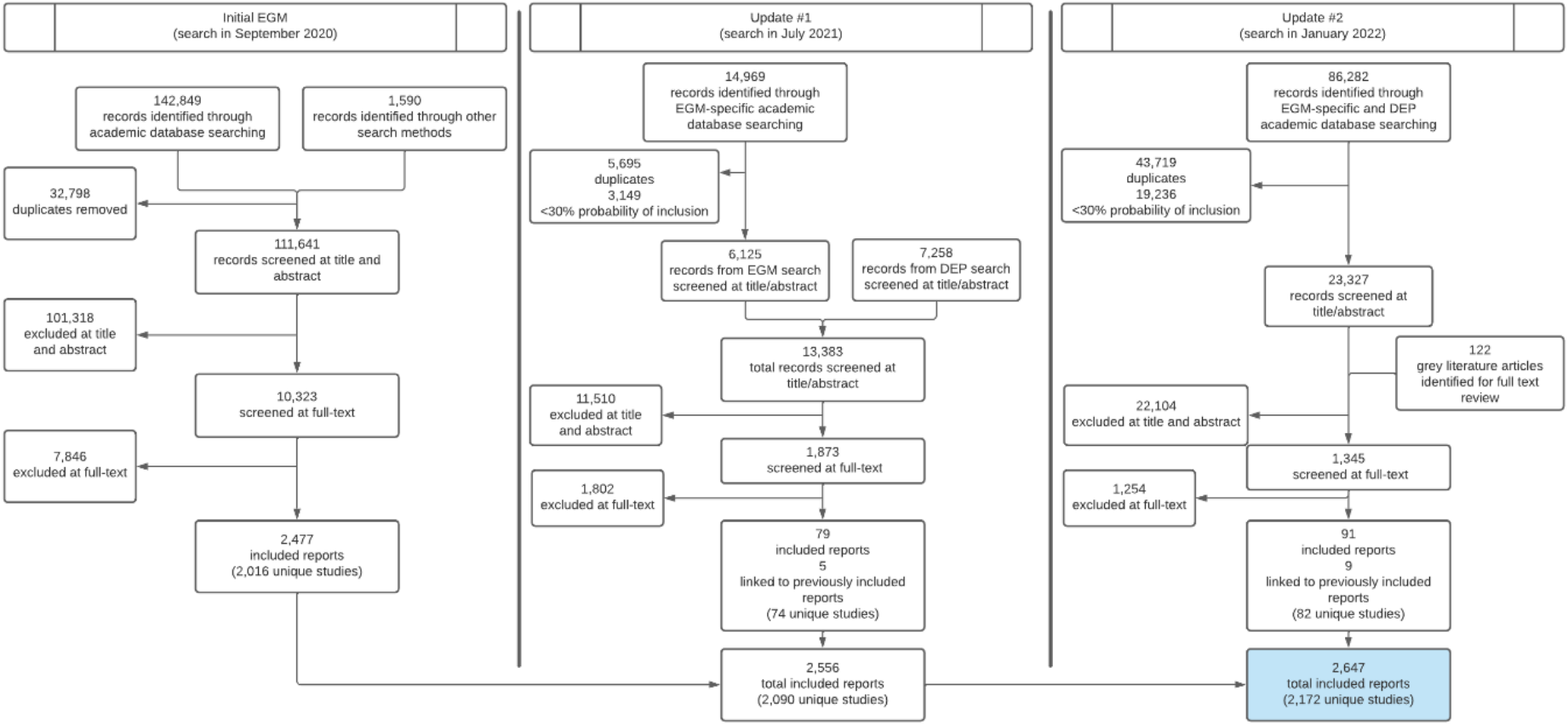
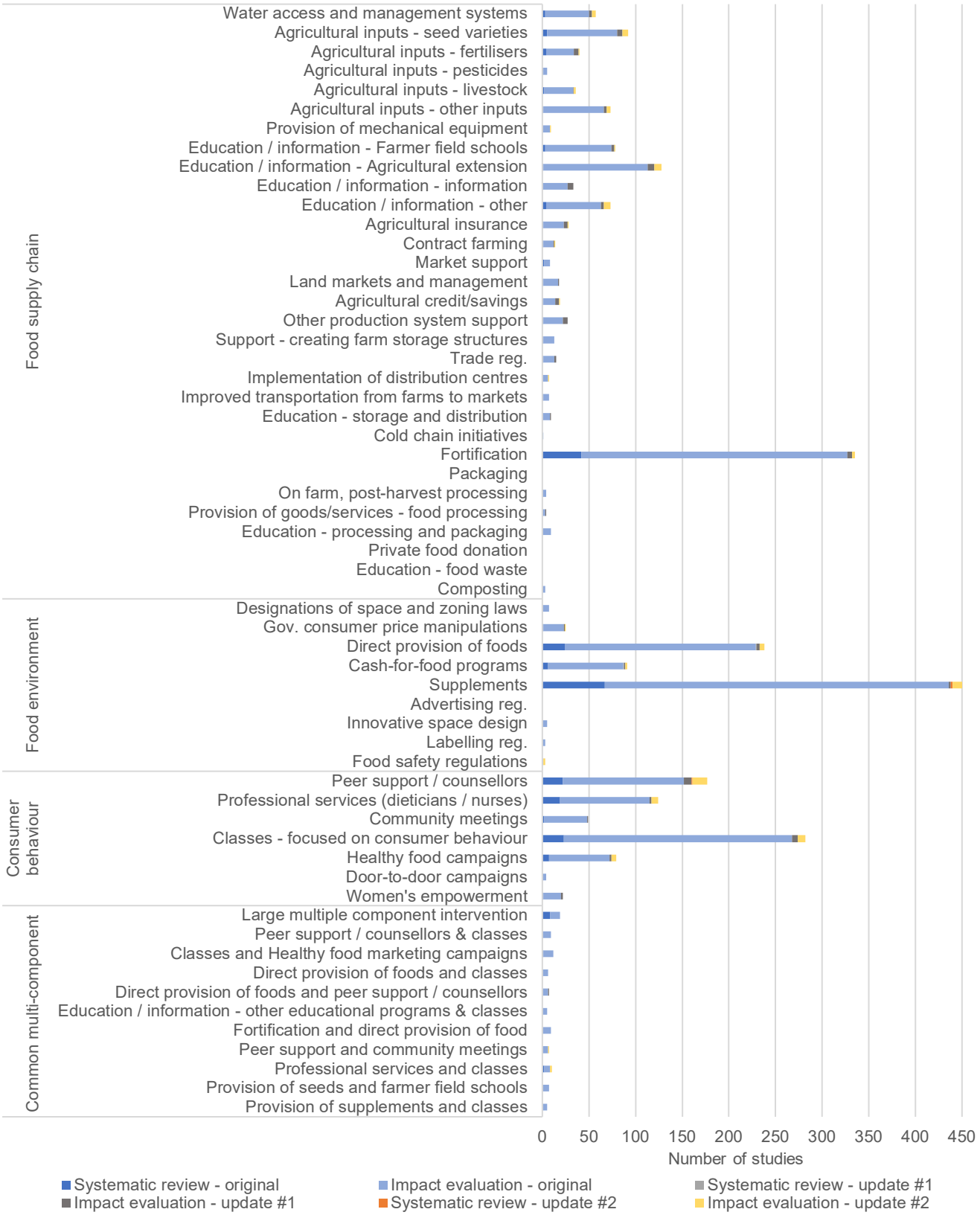
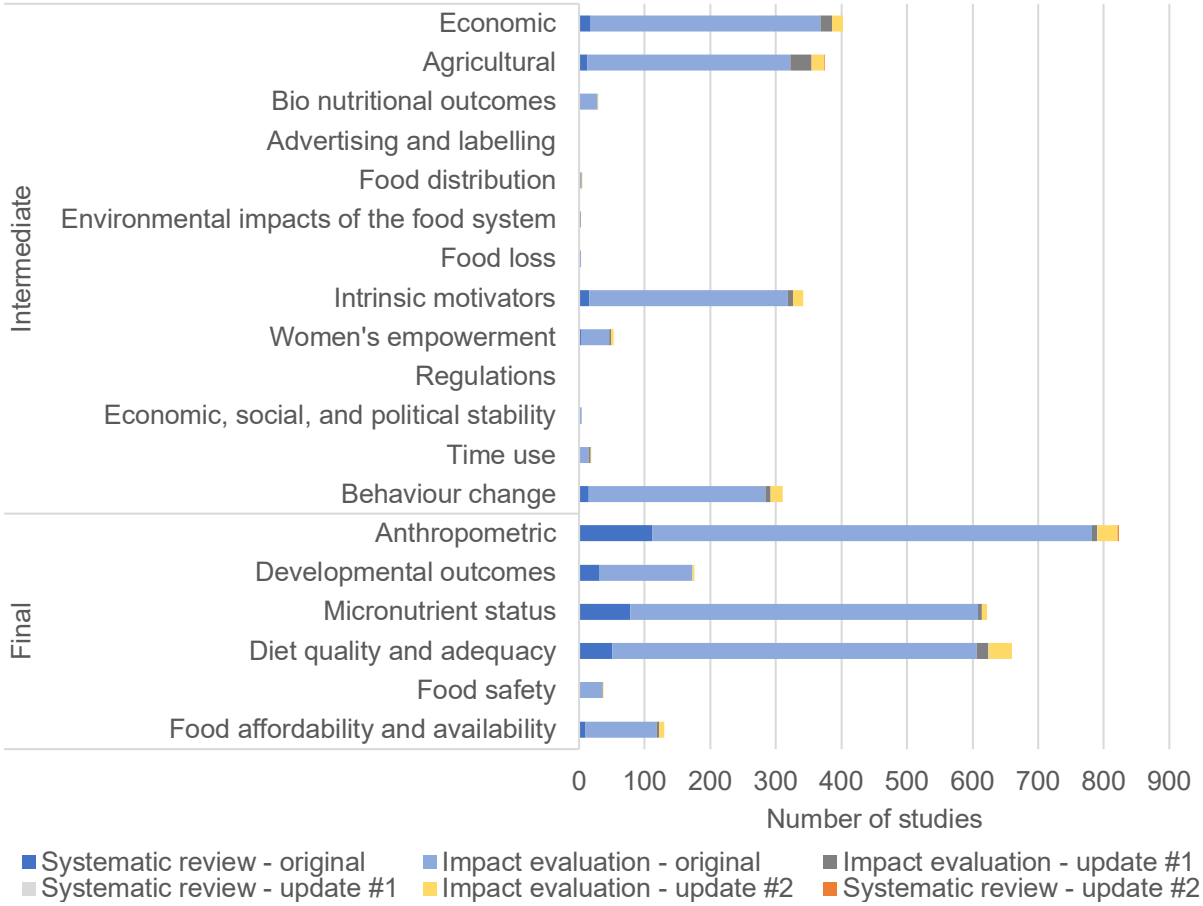


**Figure 3: Distribution of included studies by intervention domain and subdomain**



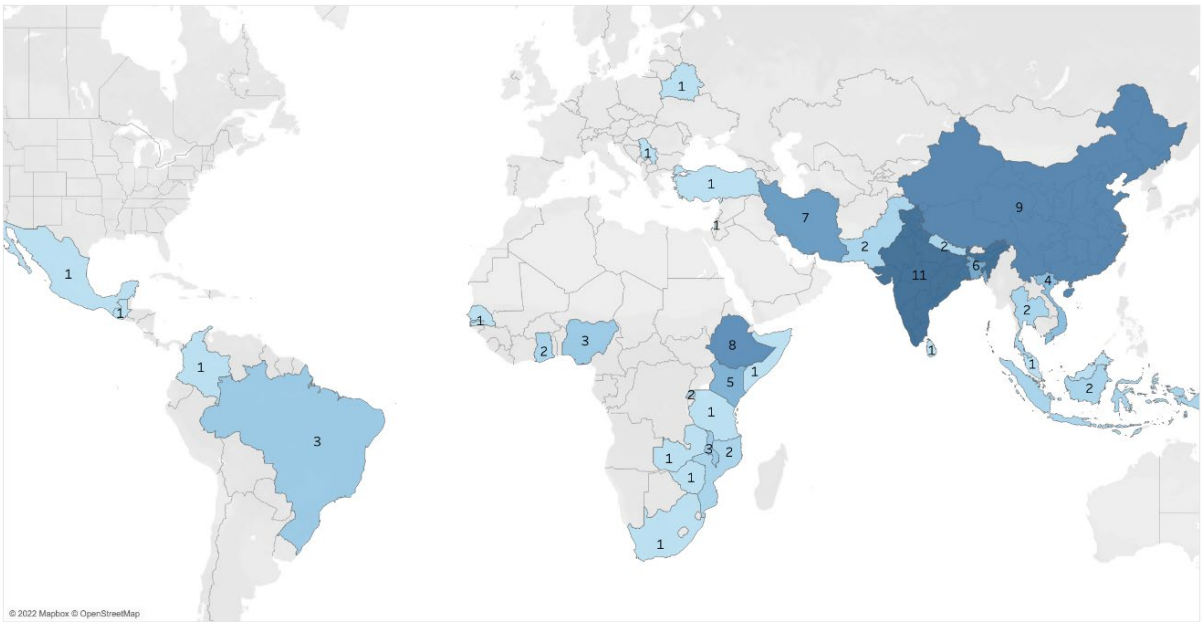
Most studies considered diet quality and adequacy outcomes (Figure 4, n=34), particularly measures of dietary diversity (n=16). Anthropometric measures (n=30), largely focused on length (n=23), weight relative to length (n=20), and weight (n=14). Agricultural outcomes (n=27) were generally related to production (n=14) or income (n=10). Three studies considered women's empowerment outcomes and four considered measures of dietary insufficiency as outcomes, both of which had been previously identified as meaningful evidence gaps.

**Figure 4: Distribution of included studies by outcome domain**




The share of studies adopting experimental designs increased from the last update, but remained below that of the original EGM: 80 per cent in the original, 59 per cent in update 1, and 67 per cent in update 2. Although there continues to be a focus on randomized trials (n=55), other approaches, such as statistical matching (n=10) and difference-in-difference (n=12) are becoming more common. The most commonly considered country is India (n=11), followed by China (n=9), and Iran (n=7, Figure 5). The three systematic reviews considered peer support / counsellors (n=1) and the provision or use of supplements (n=2). One of the completed systematic reviews was rated high confidence, while the other two were rated low confidence.

**Figure 5: Distribution of included impact evaluations by country**




## Discussion

Through our first living EGM we continue to provide researchers and decision-makers with the most up to date evidence on food systems and nutrition. We monitor if gaps in the evidence base have been filled or the research focus is changing and make new studies available through the interactive version of the EGM.

We continue to see a meaningful shift towards more **quasi-experimental designs;** although, the pattern has reverted somewhat since the first update. This shift has not been accompanied by a major change in the types of interventions that were evaluated. In fact, there was a reduction in the proportion of studies evaluating **national-level policies**, which are often thought to require such quasi-experimental approaches. We hope that the recent call for large-scale, nationally representative dietary data in low- and middle-income countries from the FAO may support the evaluations of national-level policies in the future (4). The shift in geographic focus identified in the last update, in which Kenya, Ghana, and Vietnam were the most common, has reverted, with India and China once again being the most studied countries.

Five new studies focus on areas identified as prioritized in the original map (Table 1). One study evaluates the impact of **governmental price manipulation**, China's minimum grain procurement price program, and found that the policy positively affected wheat and rice prices received, land sown with wheat and rice, chemical fertilizer use, and pesticides use (5). Two studies focused on **women's empowerment outcomes**. A nutrition-sensitive agroecology intervention, which provided education and seeds, in Tanzania increased decision making in income allocation but not agricultural decisions (6). Effects on **diet**

**insufficiency** was evaluated by two studies. One of these evaluated the effect of a mobile application intervention to reduce obesity in Thailand and found that the intervention group reduced their consumption of fast food (7).

Three recently published protocols indicate that evidence gaps may close in the coming years. A new training, certification, and marketing intervention will attempt to increase milk vendor's skills and **improve women's empowerment** (8). Two new studies will consider **measures of dietary insufficiency**, one focusing on the effects of peer support efforts on meeting infant and young child feeding requirements (9) and another considering the proportion of women and children reaching estimated average micronutrient requirements (10).

We added many studies to the well-established clusters of evidence on peer support and counselling, classes on consumer behaviour, and the provision or use of supplements. It is not clear that these studies break ground and add significantly to our understanding of the likely impacts of these interventions.

The map will be updated again in August 2022. It can be accessed here. The original EGM report is available here and the note from the first update is here.

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## Appendix 1: Studies added to EGM July 2021 – January 2022

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## About this note

This note presents information and results from the second update to the Food Systems and Nutrition Evidence Gap Map. We discuss the distribution of the evidence base and the current state of the evidence. A new note will be provided in August 2022 with an additional update.

This brief was authored by Charlotte Lane, Veronika Tree, Ingunn Storhaug, and Mark Engelbert. They are solely responsible for all content, errors, and omissions. It was designed and produced by It was designed and produced by Akarsh Gupta and Tanvi Lal.

The International Initiative for Impact Evaluation (3ie) and Innovative Methods and Metrics for Agriculture and Nutrition Actions research group were funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in February 2020 to undertake an Evidence Gap Map (EGM) of the effects of food systems interventions on food security and nutrition outcomes. 3ie is solely responsible for the regular updates and maintenance of the map.

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