



Stages of food security: A co-produced mixed-methods methodology

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Abstract: This article presents the stages of food security methodology, an adaptation of stages of progress developed by Dr. Krishna. Studies of food security are primarily survey based, applying a common set of generalist indicators across a range of agroecological areas and for a diverse array of people; these findings have provided a wealth of information and insight into the trends, challenges and the extent of food security on national, regional and global scales. Ethnographic and qualitative approaches have provided detailed, contextualized findings about the interrelated and complex nature of food security at the micro level. This co-produced, mixed methods approach brings together participatory qualitative approaches and co-produces quantitative data collection tools, which provide generalizable data geared towards supporting the development or refinement of policies and programmes to strengthen food security. Based upon a pilot implementation of the methodology in Ethiopia, advantages and limitations are discussed, as well as reflections on why co-production as a participatory approach was adopted, in contrast to other participatory processes. The findings demonstrate the ways in which co-produced approaches can offer unique insight, complementing and enhancing existing knowledge about complex challenges.

Key words: stages of food security, food security, food insecurity, mixed methods, methodology

I. Introduction

The amount of information available about food security has increased significantly since the 1970s, when the concept was defined and entered into international policy discourses. The United Nations Food and Agriculture Organization (FAO) and governments regularly collect data and publish reports on the status of food insecurity. Other initiatives, such as the Famine Early Warning Systems Network (FEWS NET), have enhanced the availability of information on food insecurity in order to identify emerging humanitarian

crises and respond accordingly. The ability to aggregate data at the national and international levels requires a level of consistency of metrics, which may exclude information essential to specific times, places and people (Chambers, 2008). Particular foci within the selection of metrics can shape the findings that emerge, result in unintended outcomes and support the promotion of policies and programmes that exclude, or deemphasize essential aspects (Cochrane and Thornton, 2016). The available data are essential for understanding the scale, challenges and trends, but it provides limited

insight into what the most effective long term, systematic responses to strengthen food security should be.

Food security is defined by the United Nations FAO as 'when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (FAO, 2003: 28). It is currently estimated that 800 million people are undernourished around the world (FAO, 2015). Defining and measuring 'food insecurity' is not a straight-forward matter; there are hundreds of definitions of food security, and hundreds of indicators proposed about how it ought to be measured (Hoddinott, 1999). As an alternative to the FAO definition, Butterly and Shepherd, for example, define food insecurity as when 'there are limited or uncertain *amounts* of safe foods, a limited or uncertain *ability* to acquire available food without stealing it, or a lack of access to enough food to meet a person's basic needs *at all times*' (2010: 28, *emphases original*). Whereas Powledge (2012) suggests the definition should include equal and consistent access to food by all people.

Policy and practice aimed to strengthen food security has similarly shifted as the concept has been refined. Early international policy focused on increasing production and building reserves as a means to ensure food security, without much focus on demand or provision (Adedeji, 1989). As the concept developed with time, so too did its complexity. Food security began to address questions of equity, poverty and other barriers, in addition to production, storage and supply at the macro level. At the 1974 World Food Summit, the focus was volume and stability; in 1983, the FAO added the concept of access, the World Bank included sufficient individual consumption in 1986 and at the 1996 World Food Summit 'safe and nutritious' along with preference were added (FAO, 2013). Barraclough and Utting (1987) drew attention to the nature of food systems that can foster food security. On the micro level, other policy

and programme initiatives focused upon the individual, based upon human rights, which includes a non-binding American resolution passed in 1976 stating that every person throughout the world has a right to a nutritionally adequate diet (quoted in Messer and Cohen, 2007). Rights-based conventions that support the right to food, which are used to advocate for, and support, food security include the Universal Declaration of Human Rights, the United Nations Convention on the Rights of the Child, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the African Charter on Human and Peoples' Rights, the Geneva Conventions and the Universal Declaration on the Eradication of Hunger and Malnutrition.

The stages of food security methodology outlined in this article does not seek to replace existing approaches to assess food security. Rather, this methodology acts to complement existing data by enhancing contextualized and locally specific information so that specific policies and programmes can be developed or enhanced accordingly. In Ethiopia, where this methodology was piloted, there are a range of policies and programmes explicitly aimed to strengthen rural food security, however farmer uptake for some of these remains low; up to a third of all households discontinue participation before completion (Bonger, Ayele and Kuma, 2004; EEA/EEPRI, 2006; Gebrehiwot and Veen, 2014; Spielman, Mekonnen and Alemu, 2012; Taffesse, Dorosh and Gemessa, 2012). The available data have identified individuals, communities and regions that struggle with chronic food insecurity, but much more work is required in order to ensure that the policies and programmes are appropriate, tailored and effective. In order for this to occur, a much more contextualized analysis is required, one wherein community members can support the identification of strengths, opportunities, challenges and barriers. The stages of food security methodology revolves around the co-production of data collection tools, and particularly the

selection of relevant and appropriate metrics, and in doing so enhances knowledge about the processes, complexity and interconnected nature of food security. Participatory research can result in unexpected and unconventional discussions in the context of food security. For example, in rural communities of Ethiopia this approach disaggregated the short-, intermediate- and long-term actions individuals take to enhance their adaptive capacity in order to overcome shocks that would negatively affect food security (Cochrane and Gecho, 2016). It also demonstrated how youth migration is connected to food insecurity (Cochrane and Vercillo, 2017). Participation can also support the emergence of new findings, which may have otherwise gone without notice, or identify areas of research that continue to be under researched, such as smallholder debt (Cochrane and Thornton, 2017). The objective of this article is to outline the stages of food security methodology and provide the rationale for each process, it is not an in-depth case study of its implementation, an evaluation or impact assessment.

II. An adaptation of stages of progress

The stages of food security methodology is an adaptation of an existing methodology, stages of progress, which was developed by Krishna to understand the dynamics of poverty (2004, 2005, 2010). Krishna, a professor at Duke University with a background as a development practitioner, set out to create an approach that would provide an improved understanding of how people experiencing poverty escape poverty, and how non-poor people become poor. Using interviews, Krishna was able to track the historical progress of individuals into and out of poverty and to identify key factors involved in those processes (Krishna, 2010). One of Krishna's important contributions to knowledge was that relatively stable figures of people living in poverty do not indicate stability of the individuals who are living in poverty; the movement into and out of poverty is significant (on average,

finding a 10 per cent change in both directions). However, for those who overcome poverty, Krishna also finds significant limits on the potential for individuals to enhance their wealth status, suggesting that structural and systemic inequalities not only entrench the poor within impoverished conditions, but also limit the potential opportunities and options for change of those who succeed in overcoming extreme and chronic poverty. Krishna's work and research results have informed how policy and interventions need to reflect these dynamics and the specific factors causing the shifts. It ought to be noted that while this article draws upon the work of Krishna, he was not the first to engage the qualitative-quantitative divide and offer a bridging methodology (Rao and Woolcock, 2003; Shaffer, 2013), nor the first to engage in debates about what information is most valid (Chambers, 1983; Netting, 1993; Popkin, 1979), and himself builds on methodological experimentation and advancement.

Foundational to the stages of progress methodology proposed by Krishna is a deconstruction of the notion of poverty; that poverty is an arbitrary measure of externally determined metrics. This deconstruction does not suggest that poverty is only the result of it being measured, rather that the way in which poverty is measured shapes how it is understood. Further, those meanings have implications for development policy and programmes. The defining metrics that classify people as living in poverty are measures that, in most cases, do not take into account the relative poverty that exists within those groups. As a result, Krishna proposes the use of community-based investigations that can develop shared meanings in order to identify factors that are crucially important within specific contexts. Co-producing the metrics used to assess levels of poverty shifts the power and objectives of qualitative data collection, from ones that may be used by governments as forms of control or as means of increasing taxation, to metrics that convey the concerns, ideas and priorities of community members.

III. Context of pilot

Ethiopia is primarily an agricultural economy (Dorosh and Rashid, 2013), wherein the vast majority of its approximate 100 million person population live in rural areas and are engaged in small-scale agricultural and livestock-related livelihoods (World Bank, 2017). Despite decades of significant investment in agricultural extension services and operating Africa's second largest safety net programme since 2005, more than 14 million Ethiopians required emergency food assistance in 2015 and 2016 (OCHA, 2016). Preventative action was not delayed due to a lack of information—monitoring data and specific, anticipated needs were well known and reported in advance (National Disaster Risk Management Coordination Commission and the Ethiopian Humanitarian Country Team, 2015). The causes driving delays are debated, but what is clear is that existing policies, programmes and services have not reduced vulnerability nor strengthened food security as hoped. It is, therefore, crucial that we develop mechanisms to ensure existing programmes and policies are effective and appropriate.

Preceding the creation of the stages of food security methodology, which began in 2013, the author had worked in Ethiopia for several years, primarily with non-governmental organizations. The pilot implementation took place in Wolaita Zone, in the Southern Nations, Nationalities and Peoples' Region, which was selected due to its high rural population density and its higher degree of variable rainfall, placing significant challenges upon smallholders, communities and the region in seeking to strengthen food security. Wolaita Zone has some of the smallest per capita land holdings in the country (Rahmato, 2007), and provides insight into the challenges that may emerge throughout the country as land fragmentation due to inheritance and population growth, alongside relatively low levels of urbanization, continue (Teshome, 2014). The stages of food security methodology, and subsequent data collection, occurred in 2015

and 2016, a time when the country, and study area specifically, were experiencing a serious drought and food insecurity situation.

The objective of this article is to present the stages of food security methodology, and illuminate what the processes entail by providing examples from the pilot that occurred within Ethiopia. A number of publications are available for readers seeking more detailed ethnographic information about the study area, as well as about the implementation, results and impact of the pilot (Cochrane, 2017a, 2017b; Cochrane and Gecho, 2016; Cochrane and Tamiru, 2016; Cochrane and Thornton, 2017; Cochrane and Vercillo, 2017). Acknowledging its brevity, this contextualization of the pilot study area situates the development of the methodology, the context within which the implementation took place, and provides a frame of reference for the examples that illustrate the processes.

IV. Methodological framework

The processes within the stages of food security methodology are outlined below in a series of steps, which differ in significant ways from stages of progress developed by Krishna. The objective in this article is to present the stages of food security methodology; it is not a comparative analysis between the two methodologies, and will therefore make only cursory reference to Krishna's work.

In the following, the stages of food security methodology is presented in six steps:

1. Contextualization
2. Community perception and survey development
3. Household survey
4. Verification
5. Replication
6. Engagement

Qualitative and quantitative research methods are utilized in this methodology, and both rely upon a facilitation process that is well versed in the socio-cultural, political, agroecological

and historical context within which it takes place. It is, therefore, suggested preceding the first research activity, the primary researcher conduct a thorough review of the literature and spend time becoming fluent in the lived realities of the individuals within the communities that will be studied. When the stages of food security was first implemented, the primary researcher had worked in Ethiopia within livelihood development, poverty reduction and social protection programmes, enabling the co-production of data collection tools to discuss specific, highly localized factors that might not have otherwise entered the discourse. The facilitation process is explored in greater detail in Step 2 below. While this outline integrates different data collection processes (semi-structured interviews, focus group discussions and household surveys), this article will not delve into how these ought best be done; the objective of the outline is to present the methodology within a limited space, while the best practices of each data collection method can be referred to in greater detail within the broader literature (e.g., Bernard, 2006; Bryman, 2008).

Step 1: Contextualization

The formal starting point is a series of targeted individual semi-structured interviews. The questions, which will vary based upon the interviewee, are used to contextualize the factors of vulnerability to food insecurity and strengths contributing to food security. The exact nature of these interviews will differ according to place, but should be purposefully selected and inclusive of different levels of government (national to local), non-governmental organizations, local researchers and a limited number of randomly selected households from the intended area of study. This step does not outline a specific number of total interviews, nor a distribution of interviews among the different stakeholder groups. The objective is not to complete an arbitrary number of interviews, but to gain fluency in the localized nature of the subject. Obtaining

'saturation' of knowledge, while commonly spoken about in research methods (Baker and Edwards, 2012), is plagued by similarly limited guidance on what saturation is, and when it is possible to know if such a point has been reached (Bowen, 2008; Guest, Bunce and Johnson, 2006). While Glaser and Strauss (1967) provide some direction, arguably there will never be a point when no new theoretical insights are obtainable, rather a point when the researcher has reached his or her limit. The objective of Step 1 is to ensure the researchers are sufficiently prepared to facilitate focus group discussions, which require a significant level of background knowledge to be effective, and that will support the development of appropriate metrics for the stages that will be used to assess and compare food security status within and between communities.

Step 2: Community perspectives and survey development

Based upon the assumption that the lived experience provides a wealth of knowledge, ideas and priorities, the stages of food security methodology emphasizes the role of co-production of data collection tools. Why co-production is utilized, instead of community-driven or community-led approaches, is explored in the discussion below. In the Ethiopian pilot implementation, 'community' referred to a government-defined geographic area, as opposed to community based on identity, livelihood practice or language. This decision was influenced by the research questions, the research location and the objectives, all of which will need to be reassessed when implemented in other contexts, for different purposes and reflective of the objectives in question. It is also worth noting that using the 'household' as a metric may not be appropriate for all places and times, or purposes. The pilot implementation used this metric as it aligned with how policies, programmes and services are designed, and thus enabled the results to transfer directly into decision maker discourses. Each research project will

need to assess which unit of assessment is most suitable for the research questions and the objectives.

Participants should have a clear understanding of the process, their role and the objective of the stages of food security methodology. Although not necessary, ensuring the findings are presented to policymakers and practitioners in order to make them more effective will enhance the participants' motivation to participate—in other words having a research agenda that explicitly involves dissemination to policymakers and practitioners, in addition to academic contributions. Within the focus group discussions, which are expected to span multiple meetings for each group, the first objective is to create community-specific stages of food security, outlining factors that identify households as belonging to either food insecure, average or food secure households. The stages also set the metrics that define these factors. For example, a spectrum can be developed with regard to land size, livestock holdings, household size and so forth, which cover the three stages of food security status.

There will naturally, and correctly, be discussion about the appropriateness of dividing relative food security into three 'stages' or groups, as exceptional cases will exist. The role of the facilitator is to ensure the focus remains upon the commonalities of these three stages, rather than exceptions. While this step appears straight forward, it can be challenging to reach a nuanced discussion of relative food security. For example, community members may identify land size as well as the number of type livestock holdings as key defining features of the three groups. These measures are important, and are captured by most food security surveys. A more nuanced discussion, which requires effective facilitation, may include the following questions:

- What is the most appropriate measure of food insecurity (by days, month, type)?
- What are the gendered expressions of food insecurity (also age, ability, ethnicity)?
- Which crops are grown by the three groups? Do they serve different purposes?
- Are there specific crops that require additional attention (fruit trees, cash crops)?
- Does access to improved seeds and fertilizer differ for the three stages?
- Is there a difference in the access households have to extension services/training?
- Are there differences in amount sold to the market and consumed by the household?
- What about other assets (improved housing, radio, mobile phone, electricity)?
- What about household-level context (number of dependents and number capable to work)?
- Does the level of education obtained in the household affect food security?
- Are indirect measures related (ability to pay for healthcare and education)?
- Are there programmes serving the poorest member of society, and how are they selected?
- Is migration (skilled or unskilled) linked to the food security situation?
- What are common non-agricultural livelihood activities, and do they differ by stage?
- Does access to credit and level of debt differ? Who receives remittances?

The inclusion of example questions above is not prescriptive, nor are they required to be asked. The purpose of having sample questions is to highlight the diverse nature of potential factors that should be explored in order to develop a more specific, tailored household survey. As factors related to food security are proposed and discussed, the focus group participants also explore the metrics on how each factor is expressed or can be measured for each of the three stages of food security. If not clear from the discussions about each measure,

attention should be paid by the facilitator to ensure that community members discuss a relevant way that the proposed measure can be investigated in the form of a household survey. In order to identify systemic challenges, barriers and causes related to the stages of food security, the facilitator should ask participants to explore why these differences exist (e.g., what brought about vulnerabilities and what enables strengths). Participants can then explore their experiences and priorities as it relates to ways in which vulnerabilities can be reduced and opportunities used to enhance strengths.

The three-tiered typology that emerges can enable specific analyses with regard to the impact of policies, programmes and services. For example, in the Ethiopian pilot implementation, it was determined that larger land holders received more training by agricultural extension providers and had more access to inputs, such as fertilizer and improved seed varieties (Cochrane, 2017a). This single metric, land size, assessed based upon the 'stages' determined in the co-production process, identified exclusion of those most in need. The community-determined metrics also demonstrate how different types of metrics, such as unskilled youth migration (Cochrane and Vercillo, 2017) and debt (Cochrane and Thornton, 2017), can be more informative than commonly used metrics, such as livestock holdings or nutritional intake. Having three groups results in simplifications and makes some realities invisible, and presents limitations, but also provides a means to analyze quantitative trends in different ways, identify new metrics and thus offer insight into how policies, programmes and services could be made more effective and appropriate (e.g., by changing intake and graduation criteria).

After completing this first set of focus group discussions, the researcher will synthesize the data and develop a draft survey, which will specify the factors and metrics that define each of the three stages. Next, the focus group participants will provide feedback on the draft

survey to refine the questions, wording and structure. The feedback process is an essential, yet under-utilized step, which ensures that the terms being used are consistently understood by community members. For example, a measure of land or a volume of seed might use a similar word, but have different meanings in different places, or a similar measure may have regionally specific names. If divided into two focus group discussion meetings, the first might include the defining of metrics and an exploration of how the differences came to exist, while the second series provides feedback on the questions, wording and structure of the household survey.

The co-production that defines this stage takes two main forms: (i) facilitation of the focus group sessions to ensure specific indicators are reflective of locally important factors, and (ii) the creation of the household survey based on the focus group information, which is refined by the follow-up focus group sessions. The approach is termed co-production because of the role played by the researcher, who contributes knowledge and experience to the discussion. This role ensures that the locally mundane is also explored. For example, in parts of southern Ethiopia every household plants *enset*,¹ which is a crop households rely upon during food insecure periods. In the focus group discussion, even when directly asked about 'what crops are planted and by whom' *enset* did not enter the discussion. Rather, it was the facilitation that probed to ensure its inclusion. Similarly, things that are normal and done by everyone may not seem valuable for discussion. In addition, the researcher synthesizes the information provided in the different focus groups in order to create the household survey. The researcher will also add specific questions, such as the inclusion of comparing the current household food security situation with 10 and 25 years past in order to assess change over time. This synthesis process is primarily led by the researcher, which is validated and refined in follow-up focus group discussions. The final data collection tool, therefore,

is the product of a collaborative effort by community members and the researcher.

Some locations will require focus groups to include specific vulnerabilities within communities, such as for ethnic and religious minorities, in order to ensure inclusive participation, which may include linguistic divisions as well as issues of power and the ability to speak within such settings. Having multiple focus group discussions within each community allows for triangulation and verification, and also enhances the facilitation because ideas can be discussed and assessed by different audiences within the same community. As with the number of interviews, the stages of food security methodology does not specify how many focus groups ought to be held, rather it outlines the flow of activities, and their respective objectives therefore providing a structure that is flexible for different contexts and utilizable to answer a range of research questions. The number of communities included for study, and the number of focus group discussions held within them, will also reflect of the specific research question(s) posed. In the pilot Ethiopian case, one of the research questions revolved around geospatial location and access to services (healthcare, education, irrigation, agricultural extension, markets), and therefore three communities within a shared agroecological zone were selected for comparative purposes. In the pilot, gender-segregated focus groups were held to ensure participants felt comfortable to share their opinions, ideas and experiences.

The co-production of data collection tools, which will differ between communities and within communities (particularly if separate focus groups are used for gender, ethnicity or religion), provides an opportunity for comparative analysis. The emphasis of factors and indicators that define each of the stages of food security will differ in some locations and by some groups over others, which allows the identification of the ways in which food security manifests itself in different ways for different people within communities, and between

communities. These are important findings in and of themselves; however, the researcher should make a purposeful effort to ensure these factors are appropriately represented within the household survey, even if they are not explicitly identified as factors within all of the focus group sessions. If a geospatial analysis is intended to be included, the survey ought to also include an indicator that will support this, which is discussed in more detail below.

Step 3: Household survey

Using the co-produced household survey, the researcher conducts a household survey of a statistically significant sample of households in the community. The socio-cultural context will determine if males and females need to be surveyed independently, or if a household survey can be conducted wherein all members of the household feel welcome to contribute. The specific indicators that emerged from the focus group discussions, which occur within the household survey, will provide a wealth of data in order to analyze the differences within and between communities. Based on the stages of food security determined in the focus group sessions, the results of the household survey can be analyzed and categorized according to the community-defined stages in order to determine which households belong to which stage and code them by location.

Krishna's research emphasized the historical changes that took place within households, and then investigated the reasons why such changes took place. The ability to track this information is embedded within the household survey, which can be analyzed in order to identify households that have experienced significant change. Thereafter, a random selection of households can be identified for in-depth interviews that will explore the causes of these shifts over time. The extent to which this is prioritized may differ based on the survey results. For example, in the Ethiopian pilot implementation of the methodology the long-term shifts were relatively minor. Based on two historical reference points of 10 and

25 years past, the vast majority of households experienced minor change between these periods, whereas significant change was more common in Krishna's findings. In the Ethiopian pilot, those households wherein food security went from much or moderately worse to much or moderately better represented only 4 per cent and those changing from much or moderately better to much or moderately worse was only 2 per cent. The findings indicate that there was a high degree of stability with regard to self-reported food security status between these two historical points, using the present as a comparative reference. The in-depth historical interviews provided insight into the causes of these changes, which largely aligned with the findings of Krishna: a positive shift was associated with new non-farm and off-farm livelihood activities, an increase of land and significant livelihood improvements, such as the introduction of large-scale irrigation infrastructure. Negative shifts were associated with declining land size, land loss, divorce, illness and death. While these historical cases provide unique insight into how, when and why significant food security situations can shift, they represent a minority of households. The survey results provide insight into the extent of shifts over time and act as a verification mechanism for the selection of household survey indicators and the findings of the focus group discussions, as they demonstrate the importance of the identified causes of change from a historical perspective.

With the household survey, it will be possible to assess the impact of geospatial differences, both within and between communities. For analyses between communities, a disaggregation based upon community may be sufficient. In the Ethiopian pilot, the communities were located in geographically distinct areas, each having unique features; disaggregation of data by community was used to answer research questions about the impact of those differences based upon community averages. Disaggregation at the community level supports the identification

of biases, agendas and remote-rural-urban divergences that have been highlighted by Chambers (2006). Researchers may also wish to disaggregate food security distribution and trends within communities by geospatial location by including an indicator that identifies the household's location within the community. While possible, in rural and remote communities where community maps are unavailable, the task can be a challenge. One approach to overcome this is with the use of GPS technology, however this too may be challenged if cellular network coverage is lacking. If geospatial data is included at the household level, then findings can be correlated across all other measures, including the changes in food security over time, as well as direct measures of food security, such as the number of months food insecure during the year. There is a tendency to focus upon macro-scales, of rural-urban and developing-developed, for analyzing the neglect of the peripheries (Amin, 1976; Chambers, 1983, 2006). Analyses of this nature provide greater detail about the community-level impacts of location, which would provide important insight into the localized dynamics of geospatial location.

In the case of the Ethiopian pilot, there were neither community maps nor cellular coverage for all the communities and therefore disaggregation within communities was not conducted by geospatial location. However, a qualitative geospatial research approach was utilized to answer a specific, unanswered question raised by researchers (Rahmato, 2007) and community members: when did land sizes become too small to sustain livelihoods. The research areas had a high population density, and historically this has also been the case; however, it remains unclear when the land size became insufficiently small, and therefore the exact reasons when and why those changes took place. In order to answer this question, a random selection of households within the community were selected, and the fifteen properties around them mapped by ownership (see Map 1). This allowed for an assessment



Map 1 Mapping community land ownership

Source: Author's own.

of when the division of land due to inheritance reduced the land size to unsustainable sizes. The detailed findings are beyond the scope of the current article; the objective of presenting this example is to demonstrate the ways in which information about geospatial location can enhance the understanding of food security, and how a diverse array of approaches can be incorporated as questions arise.

The stages of food security methodology is not designed simply to obtain and analyze the household survey results. Just as important to the findings are the processes involved and the qualitative findings, which is why this outline spends a significant amount of space emphasizing the qualitative components in Steps 2 and 4, as well as the importance of inclusive, participatory and grounded processes. The quantitative and qualitative data are designed to complement each other, each providing mechanisms to triangulate, verify and explain the data of the other.

Step 4: Replication

Steps 2 and 3 are repeated in additional communities that are selected for study. If the communities are located in different areas and have different socio-cultural, political, agro-ecological and historical contexts, then aspects of Step 1 will also need to be repeated. In either case, the objective of the replication process is to provide additional data on food security in order to compare and contrast within and between communities. In the case that specific research questions are being posed, as was the case in the Ethiopian pilot, then the purposeful selection of additional communities for study can enable a form of a 'natural experiment' whereby access to services (healthcare, education, irrigation, agricultural extension, markets) can be compared to those without such access. A process flow diagram (Chart 1) outlines the steps for implementing the methodology in three communities; this is a demonstrative example and the number of

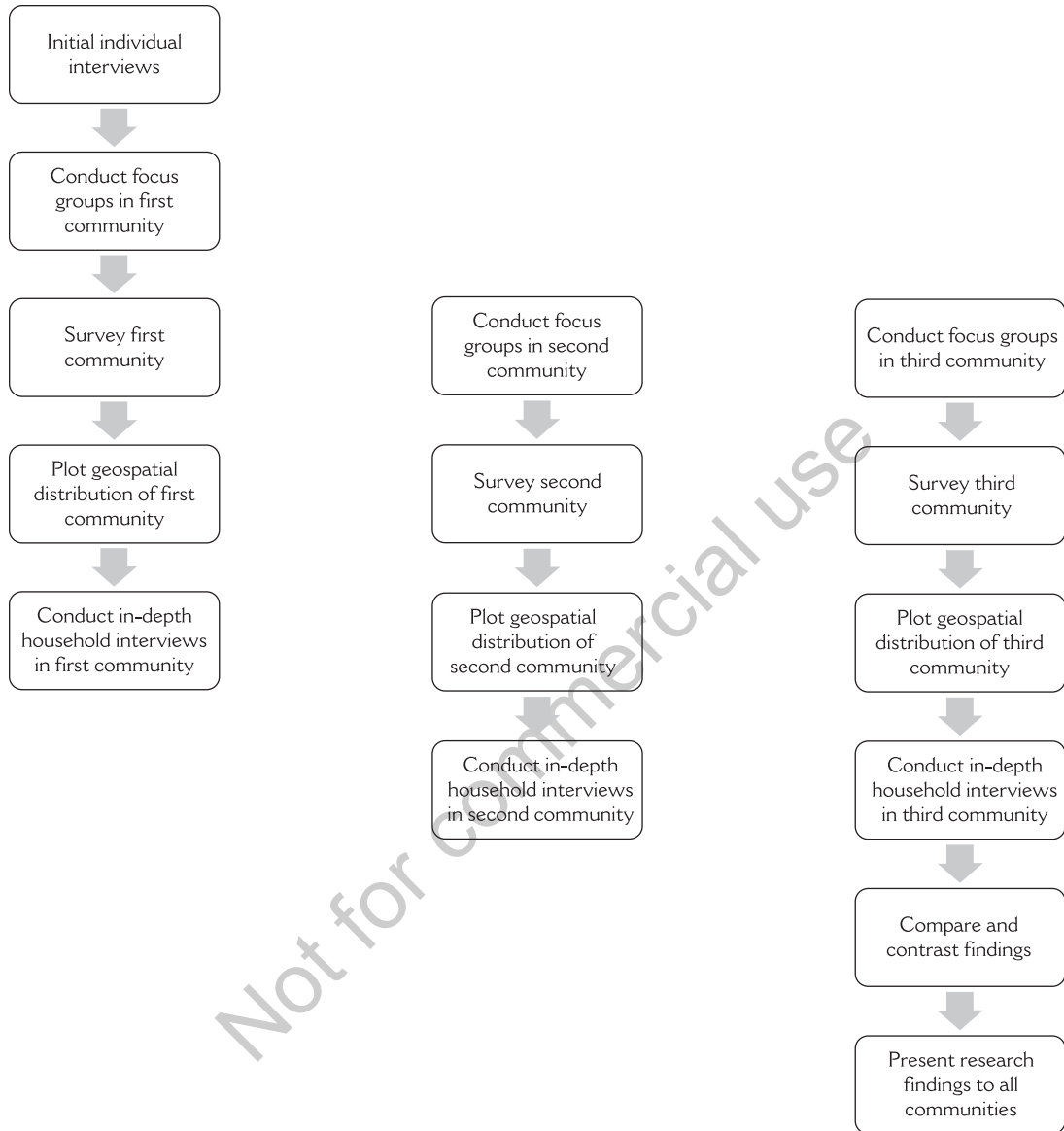


Chart 1 Flow diagram of research activities

Source: Author's own.

communities included in the study should be determined by the researcher and designed to reflect the research questions.

Step 5: Verification

After the household survey data are analyzed, or at least the preliminary findings are

obtained, these results should be presented in focus group discussions within the communities studied, using the same number and structure designed in Step 2. The researcher will present the findings and allow community members to share their feedback. In many instances, the findings will be confirmed with

additional explanatory detail provided about the context. This process validates the household survey data. In other instances, community members may disagree with the findings, which enables for a community-driven critique of why that result may have emerged, or how it may have incorrectly captured the reality of their situation. The disagreement with the findings does not mean that the findings are false per se, rather it is the discussion about those divergences that provide a wealth of qualitative insight. In the Ethiopian pilot experience, the number of disagreements with the results were few; however, there were some insightful conversations about the results between community members. For example, the relatively poorer members of the community were unaware that other members of their community had significantly more assets, when compared to their own situation. The findings of livestock holdings, land size and number of fruit trees resulted in lively discussions about the spectrum of different food security situations within their community, and the reasons why inequalities exist.

Following the focus group discussions, the stakeholders identified in Step 1 should be re-visited for the purpose of sharing the results and seeking their input on the findings. These meetings can similarly act as a verification of the data, from an audience that is disconnected with the data collection process. These are not interviewees per se, but discussions that allow stakeholders to gain insight from the findings and allow stakeholders to share their experiences with regard to policies and practices that address the issues identified. In addition to the stakeholders identified in Step 1, the results and verification discussions may support the identification of new, specific research questions. In the Ethiopian pilot, a specific set of interviews were conducted in order to better understand the gendered nature of youth migration and another set seeking to gain insight on the experiences of climate change over time, which provided qualitative data to complement meteorological data. These are two examples of factors

that were not initially included in the study, but emerged as priority concerns from the focus group discussions and interviews, and thus warranted additional data collection processes.

Step 6: Engagement

The last step of the methodology is working within and beyond communities to engage stakeholders to ensure the ideas, priorities and findings that emerged from the research are used to support better informed decision making. This step goes beyond the informing of stakeholders outlined in Step 5, in an effort to ensure that community members have the knowledge and skills to continue long-term engagement within and beyond their community, having access to the tools, findings and outcomes and being able to utilize them in effective and appropriate ways. There are a diverse set of approaches that this can take (Green, 2016). An evaluation or impact assessment of the Ethiopian pilot activities has not yet been conducted; however, approaches to enabling, facilitating and supporting sustained change need to be embedded within, and informed by, local contexts, lest they cease once the research project ends. As a result, the description of the sixth step of the methodology is less specific and detailed because its manifestation will vary greatly based upon the local, regional, national and international contexts.

Three decades ago, Platzky and Walker (1985) describe, in the context of the struggle against apartheid, the 'supportive outsider' as often having different objectives and victories than those of community members, and their departure may result in a reversal of positive change. They suggest, as does Krishna (2010), one of the most useful contributions is improving access to relevant information. Step 6 does not necessitate the implementation of a series of capacity-building activities alongside the delivery of new tools and technologies. Where and when the resources exist, this might be employed, yet the key contribution

made in this component of the methodology is ensuring that community members have the ability to access information in ways that are appropriate and useful to them. In some instances this may require translation, in others it may involve the fostering of 'knowledge brokers' with whom the community may interact. The sixth step pushes research into action by ensuring that community members have the capacity to continue community-led action over the long term, or by connecting community members with other stakeholders who can play this role (e.g., community-based organizations).

V. Reflexivity: Participation and co-production

The utilization of both participatory and non-participatory processes stems from experiences that some participatory approaches place an unrealistic burden of time requirements and unfair responsibility upon community members (see Cooke and Kothari, 2001). Participation is essential in order to understand the dynamics of specific contexts and to develop approaches suitable to the needs of the community in question, which can highlight unknown, unseen or undervalued aspects of local agricultural settings and facilitate the greater inclusion of unobserved diversity, complexity and microenvironments (Chambers, 2008). In other instances, such as the creation of a national highway system or national regulatory and monitoring framework for water quality, diverse and representative participation may have limited practical benefit (Hurlbert and Gupta, 2015). In this regard, Duflo (2012) makes a strong case that non-participatory planning has a role and that not all development activity should include broad participation. Without feedback mechanisms in place, however, which can take the form of participatory citizen engagement, planning in this form can result in enhanced inequality and entrenched marginalization (Green, 2012; Kabeer, 2010). The challenge, therefore, is determining when, where and how participation is appropriate and effective.

The stages of food security methodology includes both participatory and non-participatory processes. The focus groups utilize participatory, co-production approaches, the findings of which determine the content of the survey and the selection of additional interviews. The surveying process, however, is not participatory in the sense that community members do not conduct the survey. The survey and mapping activities are conducted by the researcher, and research assistants if required. In the stages of food security methodology, participation is essential for understanding the localized strengths, opportunities, challenges and barriers, and thus utilized. However, participation in conducting the household survey poses a burdensome level of time, with limited benefit of doing so, and thus implemented in a non-participatory fashion.

Co-production, as a research approach, was purposefully selected. Based on past experiences, focus group discussions that are entirely community-led and community-driven, may not tease out the nuance sought after. Some topics might be avoided, such as those that are politically or socio-culturally sensitive, whereas others may not be critically reflected about. The example of enset mentioned above is demonstrative of this; a crop that is crucial for food security in the community was entirely absent from the discussion. Likewise, those who have had irrigation for long periods of time, and for whom it had become normalized, neglected to critically assess the impact of this infrastructure. Similarly, the researcher has limited knowledge, wherein biases, emphases and normalizations push research and priorities into specific directions. The co-production approach enables respective strengths to be utilized and limitations addressed. As a result, the stages of food security methodology adopts a co-production approach, wherein both the researcher and the participating community members contribute. The result are more dynamic discussions, although are also the ones that place a greater burden of responsibility upon the researcher to be an informed and adept facilitator.

VI. Discussion and conclusion

The stages of food security methodology is broken down into six steps in this article, providing an outline of the key activities, objectives and reasoning behind them. The methodology is based upon years of experience collecting data, largely of qualitative nature and working with communities. Researchers drawing upon this methodology should not feel obligated to ensure each and every task is included, and are encouraged to add steps that enhance the process. The inspiration for the stages of food security methodology came from Krishna's stages of progress, and further iterations will enrich our understanding the dynamics of food security, which enhances our collective ability to (re)design policies, programmes and services to strengthen food security. The results that emerge from the stages of food security approach provide different insights, often focusing upon localized challenges, barriers and exclusion. This methodology did not set about to redefine or reassess food security, but to co-produce data collection tools that support the development of better informed policies, programmes and services. An example of this from the pilot was the identification of problematic components of the implementation of the safety net programme, which helped to explain why the programme was not having the impact that was intended and expected (Cochrane and Tamiru, 2016). An insufficient amount of time has passed to assess the impact of the pilot, but the potential for significant shifts in policies, programmes and services exists. Additional implementations of the stages of food security methodology will allow for a broader set of evaluations and impact assessments to be analyzed in order to understand the extent to which the methodology advances knowledge about the complex challenges related to strengthening food security.

The methodology outlined in this article is not the most appropriate approach in all settings, nor does it answer all questions about food security. The methodology complements existing data by providing new insight,

it bridges the knowledge gaps between the qualitative and quantitative data, and opens avenues to support the improvement of policies and programmes with contextualized, relevant and specific in-depth data. The stages of food security methodology also shifts the focus from analyzing the extent, challenges and trends of food security to that of informing policies and programmes. There are, however, limitations. The approach is time and resource intensive, and the findings will have a limited ability to provide generalizable results. The quantitative data provide representative and statistically significant results for the communities studied, which supports and amplifies the concerns, priorities, ideas and experiences of community members. While being able to inform local policies and programmes, scalability is a limitation. This methodology, therefore, should be understood as a being complementary to other necessary methodologies collecting data on food security, each of which contribute to an improved understanding of the complex, interrelated challenges that intersect with food security.

Note

1. *Ensete ventricosum* is a large non-wood flowering plant that can grow up to 6 metres in height.

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