



**Gender and Nutrition Measurement Tools: Evaluating Their
Appropriateness in the Context of Zambia**

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Rhoda Mofya-Mukuka and Mulako Kabisa

Working Paper 120

March 2017

Indaba Agricultural Policy Research Institute (IAPRI)

Lusaka, Zambia

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The Indaba Agricultural Policy Research Institute is a non-profit company limited by guarantee and collaboratively works with public and private stakeholders. IAPRI exists to carry out agricultural policy research and outreach, serving the agricultural sector in Zambia, so as to contribute to sustainable pro-poor agricultural development.

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Any views expressed or remaining errors are solely the responsibility of the authors.

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EXECUTIVE SUMMARY

Zambia remains one of the countries with the highest levels of malnutrition on the African continent, despite increasing investment to curb the situation. Similarly, Zambia continues to perform poorly on gender equality. Evidence from the Zambian Demographic Health Survey reveals that in comparison to men, women have less education, lower literacy levels, and less exposure to mass media, which directly affects their position in their households as well as society (CSO 2015).

Prioritizing improvements to nutrition status and gender equity in agricultural extension policy actions and project interventions will largely depend on results on the impact of past or ongoing interventions. Several measurement tools have been developed to monitor the impact of agricultural interventions on gender outcomes and improved nutrition. The Women Empowerment in Agriculture Index (WEAI) is currently widely used to measure the impact of agricultural interventions on gender equity. For impact on food access and nutrition, measurement tools such as Household Dietary Diversity Scores (HDDS), Individual Dietary Diversity Scores, Minimum Dietary Diversity for Women (MDD-W), Children's Dietary Diversity Scores (CDDS), and the Household Hunger Scale (HHS) are widely used.

In this study, we explore the appropriateness of the use of some of these measurement tools in monitoring impact of agricultural interventions on gender and nutrition outcomes in the Zambian context. The measurement tools that were field-tested were the HDDS, MDD-W, CDDS, HHS, and components of the WEAI and Women's Asset Ownership Index. The study examines the case of Programme Against Malnutrition's (PAM) Empowering Women through Agricultural Support (EWAS) project in Senanga District, in the Western Province. The EWAS project focuses on women's empowerment and improving nutrition for the household. Interviews were carried out with 148 households participating in the project using validated measurement tools to collect information on the impact of the project. The respondents were women participating in the project. Out of the 148 interviews, 120 were with women between the ages of 15 to 49. Female-headed households constituted 33.8% of the interviewed households. The mean education level observed among the respondents was grade seven.

Experiences of the enumerators and respondents on the use of measurement tools during the interviews were recorded and analyzed.

Key Findings

1. Feedback from respondents and the enumerators' observations suggest that the most problematic measurement tool was the household hunger scale. The difficulties encountered included the recall period being too long (one month) given recurrent hunger incidences. Another difficulty was understanding the levels of hunger, represented by the follow up questions on the scale, thereby failing to interpret what enough food was.
2. Questions on household dietary diversity were difficult for approximately 7% of the respondents according to the enumerators' observations and 6% according to the respondents' observations. Even when appropriate prompts were provided by enumerators, respondents encountered difficulty remembering every single thing that all household members ate within the 24-hour recall period.
3. For gender equity questions, the study found that the most difficult questions were those relating to decision making in terms of input and extent. Specifically the question, *To what extent does the respondent feel they can make their own personal decisions on agricultural activities?* Approximately 25% of the respondents had difficulty answering this question as observed by the enumerators and 23% as reported by the respondents.

Reasons such as cultural norms and fear of being viewed as too aggressive for a woman were the prominent explanations as to why the question was difficult to answer.

4. In general, socio-cultural norms affected responses during the interviews. When the enumerators were asked if they observed anything regarding the way society is structured which affected the way the respondents answered the questions, enumerators said that this could possibly have affected some responses to the questions asked. Socio-cultural norms mostly influenced responses on decision-making and asset ownership.
5. Combining the three dietary diversity measurement tools in one questionnaire was problematic for some respondents who found the questions repetitive, and in a frustrated manner signaled that they had already responded to the questions. The section on dietary diversity scores took much longer to interview compared to questions on HHS and the gender questions.
6. The interview was conducted in September, a dry season and a time that most households experienced inadequate food provisions. It was noted that some respondents gave skewed responses because they anticipated food aid.
7. Regarding resource requirements, the application of the tools in Zambia is quite costly given the distances between villages, particularly for Western Province, which has very sandy soils. The survey took longer than it would normally take when conducted elsewhere which translated into additional costs because of the terrain and distances.
8. It is important to have high quality training for the enumerators and supervisors, which requires hiring experts.

Conclusion

The field-testing of measurement tools for gender equity and nutrition impacts of agricultural interventions has provided several lessons for future application of the measurement tools in the Zambian context. The relatively low percentages of respondents that had difficulties in answering the questions indicate that the gender equity and nutrition measuring tools tested are applicable to the Zambian context. Most of the challenges faced by respondents in responding to the questions on the tools relate to: a general lack of understanding of the questions (even after translating to local language); respondents' perceptions and expectations from the interview; socio-cultural influences; poor memory for recall questions; and questionnaire length.

The level of education of the respondents, largely, explains the problems the respondents faced with understanding of some of the questions, the quality of responses and recalling of activities and food consumed in the past. In addition to these challenges, the costs of implementing the tools turned out to be higher than expected because of the sandy terrain, poor road infrastructure, and long distances between the villages given that Zambia, and the Western Province in particular, has low population density.

To use the tools more effectively in the future, data collection should not be conducted during the season of lean food supply as respondents' expectations of food aid influenced how certain questions were answered. Additionally, project implementation should prepare the beneficiaries for impact monitoring and evaluation. For example, respondents should be advised to pay attention to what they and their household members consume or what activities they carry out on a daily basis.

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ACRONYMS

CDDS	Children's Dietary Diversity Scores
CSO	Central Statistical Office
EWAS	Empowering Women through Agricultural Support
FANTA	Food and Nutrition Technical Assistance Project
HDDS	Household Dietary Diversity Scores
HHS	Household Hunger Scale
IAPRI	Indaba Agricultural Policy Research Institute
IDDS	Individual Dietary Diversity Scores
INGENAES	Integrating Gender and Nutrition within Agricultural Extension Services
MDDS-C	Minimum Dietary Diversity Score for Children
MDD-W	Minimum Dietary Diversity for Women
PAM	Programme Against Malnutrition
WAOI	Women's Asset Ownership Index
WEAI	The Women Empowerment in Agriculture Index

1. BACKGROUND

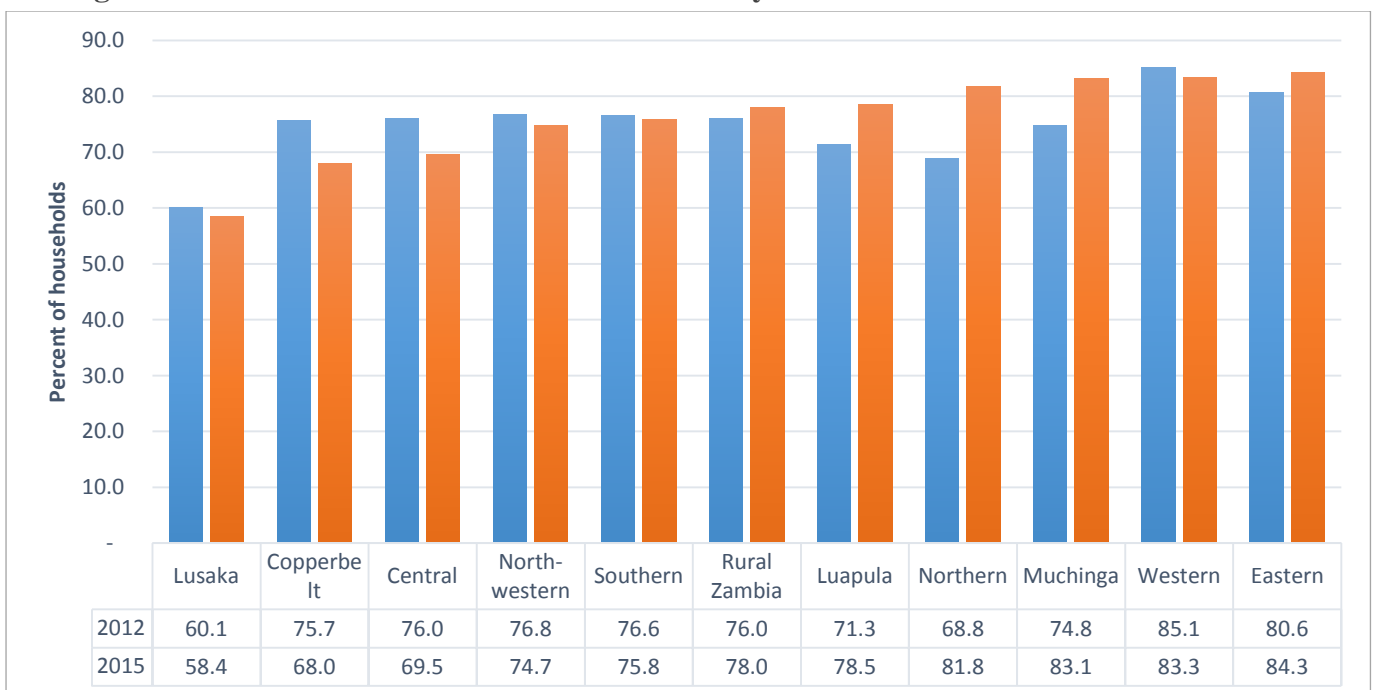
1.1. Introduction

The Zambian Living Conditions Monitoring Survey of 2015 shows that about 54.4% of Zambians are living in poverty with 76.6% being from the rural areas (CSO 2015). The Global Hunger Index shows that 47.8% of the Zambian population is undernourished (von Grebmer et al. 2016). Such startling statistics have led to numerous efforts to improve agricultural productivity in Zambia, but poor nutrition continues to plague the country, particularly in the rural households (Benhammouche and Odenigbo 2015). The Global Nutrition Report shows that Zambia is not on track to reach its World Health Assembly target for stunting, wasting, and overweight for under-five children (Longley and Thilsted 2015) in spite of recurrent bumper harvests of staple foods (Chapoto et al. 2015).

The Rural Agricultural Livelihood Survey 2015 results show that Western Province has about 83.3% of its rural agricultural households living in poverty (CSO/MAL/IAPRI 2015). The province is also characterized by having high food insecurity (Chapoto and Zulu-Mbata 2015). This is because the households in the Barotse floodplain face difficulties in agricultural productivity stemming from climate variability that affects crop yields as well as livestock diseases (Longley and Thilsted 2015). Figure 1 shows levels of poverty across the provinces in Zambia.

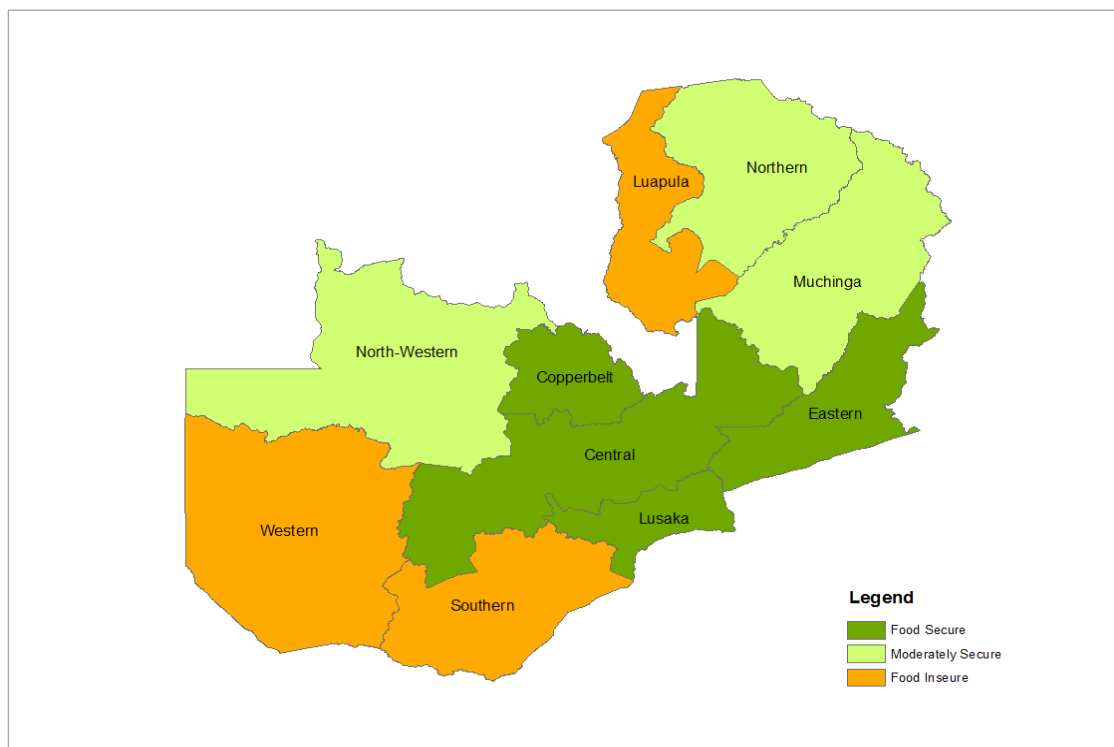
In addition, Zambia’s regional food security map shows that most of the Western Province is rated as food insecure (Figure 2).

Figure 1. Distribution of Poor Rural Households by Province



Source: CSO/MAL/IAPRI 2015.

Figure 2. Provincial Level Food Security Status



Source: Authors computation from CSO/MAL/IAPRI 2015.

Gender inequality is an issue Zambia continues to perform poorly in. Evidence from the Zambian Demographic Health Survey reveals that in comparison to men, women have less education, lower literacy levels and less exposure to mass media, all of which have implications for their position in their households as well as society (CSO 2015). Similarly, Zambia is ranked 29th in Africa when it comes to gender equality and women continue to face inequalities that limit their access and control of productive assets, resulting in them disproportionately bearing the brunt of poverty (Zambia Country Analysis 2015). This inequality and poverty link has a direct effect on the nutritional status of households in that high levels of gender inequality are associated with higher levels of both acute and chronic undernutrition in agricultural households as well as their communities (Herforth et al. 2016; FAO 2012). The link between agriculture, gender equity, and nutrition is well documented (Malapit et al. 2015; Malapit and Quisumbing 2016).

Several measurement tools and indicators have been developed and validated for measuring nutrition outcomes (FANTA 2008; FAO and FHI 360 2016) and gender equity (Quisumbing et al. 2013; Alkire et al. 2013).

Since February 2016, IAPRI, in collaboration with University of California at Davis (UC Davis), has been implementing the Integrating Gender and Nutrition within Agricultural Extension Services (INGENAES) Project. IAPRI's primary role is to contribute to a better understanding of how to measure the impacts of agricultural extension services on nutrition and gender outcomes within the Zambian context. The first activity of the project was to explore the measurement tools and indicators used to monitor and evaluate the impact of agricultural extension interventions on gender equity and nutrition outcomes in Zambia. The study found that the most common tools used to measure economic food access and nutrition outcomes in Zambia were Household Dietary Diversity Score (HDDS), Household Hunger

Scale (HHS), Individual Dietary Diversity Score (IDDS), Minimum Dietary Diversity for Women (MDD-W), and the Children's Dietary Diversity Score CDDS. It was also found that the most common measurement tools in assessing gender equity were components of The Women Empowerment in Agriculture Index (WEAI) and the Women's Asset Ownership Index (WAOI).

Inasmuch as these measurement tools and indicators are already validated and internationally accepted to collect information on gender equity and nutrition outcomes, literature on the appropriateness of use of these measurement tools in the Zambian context is scant. Hence, this study is aimed at evaluating the appropriateness of use of the measurement tools in the Zambian context to assess the impact of agricultural interventions on gender equity and nutrition outcomes.

The study examines the case of the Programme Against Malnutrition's (PAM) Empowering Women through Agricultural Support (EWAS) project in Senanga District, Western Province. The overall objective of the study is to examine the application of selected impact measurement tools of agricultural extension interventions on nutrition and gender equity. The study has two specific objectives:

- i. Analyze the challenges faced by the enumerators in data collection and the respondents in data provision using these tools; and
- ii. Examine the cost and time implications of the application of the measurement tools.

2. METHODOLOGY

The study applied both qualitative and quantitative research methods. Three questionnaires were developed for data collection in Senanga District. The first questionnaire was administered by the enumerators to the households. In this report, this questionnaire is referred to as the *main questionnaire*. The second questionnaire was self administered by the enumerators. This was to collect information on the enumerator's observations of how the interview went; specifically which questions the respondent had difficulty answering. For this study, the second questionnaire is referred to as the *enumerators' after-interview questionnaire*. The third questionnaire was administered to the respondent by the supervisors after the main interview. This questionnaire captured information on which areas the respondents felt they had difficulty in answering. This questionnaire is referred to as the *respondents' after-interview questionnaire*.

2.1. Background on the EWAS Project

IAPRI partnered with PAM's EWAS project to field test commonly used measurement tools and indicators to assess gender equity and nutrition outcomes in the Zambian context. The project is implemented in two districts in Western (Senanga) and Southern (Gwembe) Provinces. The aim of the EWAS project is to improve female farmers' livelihoods through increased incomes and resilience to the effects of climate change. The project has three intervention areas:

- i. Climate-Smart Agriculture and Food Security: the Climate-Smart Agriculture program promotes cultivation of drought resistant and nutritious crop varieties such as orange maize, which has comparatively higher nutritional value than white maize. The project promotes horticulture production and innovations such as the construction of clay stoves for household food preparation;
- ii. Gender and Nutrition: The EWAS project in collaboration with Non-Governmental Organizations Coordinating Council and Zambia Land Alliance helps to facilitate land ownership titles by enabling women to have offer letters from chiefs; and
- iii. Incomes and Livelihoods by Scaling Home Gardens. This component is meant to enhance women's economic empowerment by targeting rural women to help them produce crops for sale and home consumption.

The project collaborates with Community Markets for Conservation, local districts, and the Conservation Farming Unit to build capacity on processing crops to enable value addition through use of equipment such as solar dryers for fruits and vegetables and hammer mills.

The project area that was visited was Senanga District. Forty-one villages, representing all the parts of the district, were visited. Table 1 shows the number of households interviewed and the list of villages.

2.2. Data Collection

The *main questionnaire* was divided into three sections. The first section captured information on household composition. The second section was on nutrition and food access, which collected data for calculating HDDS, MDD-W, CDDS, and HHS. The last section focused on gender equity and was composed of subsections for each of the five domains of the WEAI.

Table 1. List of Villages and Number of Households Interviewed

Village	No. of Households Interviewed	Village	No. of Households Interviewed	Village	No. of Households Interviewed
Liyambo	14	Maongo	1	Lichecha	2
Sangungu	1	Juma	2	Nanduso	11
Liyendela	20	Mpanda	1	Nanjeko	4
Situnga	1	Luleta	1	Ngandalo	4
Kande	2	Ikulaa	5	Munguli	10
Mau	5	Panda	1	Mupweta	1
N'oka	1	Naloyela	1	Kobia	3
Lutala	4	Libumbu	1	Katuya	1
Sitemwe	3	Kandiana	2	Liyendela Subulwa	2
Mangambwa	1	Nakatoya	2	Ng'uma	1
Namutondo	2	Namaenya	11	Sipumo	1
Namalya	1	Kambole	3	Situnga Lyamba	3
Mboma	1	Sibumbu	5	Mbwatama	4
Kabobo	4	Lilume	5		

Source: Authors.

The enumerator's after-interview questionnaire and the respondent's after-interview questionnaire were administered after each interview and were divided into two sections: nutrition and food access, and gender equity.

A total of 148 interviews were held with households where at least one woman was benefiting from EWAS interventions through the women's clubs. The total number of women targeted by the EWAS project in Senanga District is 1,050 (PAM 2012). The sampled number of women interviewed represents 14% of the total number of targeted women. The interviewed households were selected on the basis of membership to EWAS women's clubs and the respondent was the club member. Of the 148 interviews, 120 were with women between the ages of 15 and 49 years old. Where the women members of the EWAS clubs were outside the 15 to 49 age group, interviews were done for HDDS, CDDS and the gender related questions but data for MDD-W was not collected for them as they do not satisfy the criteria of being women of reproductive age. Data for 45 children was collected from the same households to calculate CDDS.

For the 148 respondents, the mean year of education was Grade 7 (Standard 6). None of the respondents had attained education levels higher than Grade 12. About 34.5% of the respondents were from female-headed households. The sex composition of the household members was 49.9% male and 50.1% female. Education levels among the household members of the interviewed households are generally low such that the mean years of education is Grade 7 (Standard 6). About 16% of the household members have had no formal education while only 0.5% had attained education higher than Grade 12. Among the respondents, 12.8% have no formal education and none of the respondents has attained tertiary education. Table 2 summarizes the demographic characteristics of the respondents.

Table 2. Demographic Characteristics of Respondents

Marital status	(%)	Education	(%)
Single	6.8	No education	12.8
Monogamously married	57.4	Primary (1-7 years)	52.7
Polygamously married	8.8	Secondary school (8-12 years)	34.5
Widowed/divorced/separated	27.0	Tertiary education (> 13 years)	0

Source: Authors.

2.3. Research Team Composition and Enumerator Training

The research team was composed of nine members (three from IAPRI, two from PAM, and four research assistants from the IAPRI database of part time research assistants). The nine were divided into three enumeration teams composed of a supervisor and two enumerators. Each team had one male and one female enumerator. Each enumerator interviewed an average of 30 (about five per day) households over a period of five days.¹

Training of enumerators was conducted for a period of three days. The first day of training was focused on the gender component of the questionnaire. The last two days were dedicated to the nutrition component of the questionnaire as well as field-testing of the entire questionnaire. A half-day pre-test of the questionnaire was conducted in Rufunsa District, which is 162 kilometers from Lusaka. Each enumerator conducted two interviews of the main questionnaire.

After each household interview, the supervisor administered the respondent's questionnaire to find out what challenges were experienced by the respondent during the interview. The enumerator also filled in an enumerator's questionnaire to understand the enumerator's observations of respondents during the interview as well as their own perspectives of how each interview went.

¹ The total number of interviews was 150 but two were discarded for being incomplete because the respondents had to attend to other assignments before the end of the interview.

3. FINDINGS

3.1. Costs and Resource Requirements

Collecting adequate information to measure intervention impact requires resources such as personnel, stationary, transport, and accommodation. Human and financial resources are critical to conduct a survey, and are required at different stages including planning, coordinating, training, field testing, recruitment, data entry, and cleaning and analysis. The cost of these resources is largely dependent of the type of measurement tool used (which determines period of enumerator training), the survey size, distances, and time required.

The training, field-testing, and fieldwork took a total of 92 hours (see Tables 3 and 4). This was over an eight-day period. This time is inclusive of travel time to and from Senanga. This time does account for the travel time within the district, which varied greatly from day to day depending on the availability of respondents and distances to project villages. However, on average, the enumeration teams spent 10 hours per day conducting the interviews and travelling to the villages.

Two specialists were hired to conduct training on gender and nutrition. The nutrition expert came from the National Food and Nutrition Commission and the gender specialist was a gender consultant from the INGENAES project.

Table 3. Time Requirements

Activity	Time (Hours)
Enumerator Training and Field testing	
Gender Training Day 1	7
Nutrition Training Day 2	7
Nutrition Training and Field Testing Day 3	8
Field Work	
Traveling time to and from Western Province (10 hours a day)	20
Household interviews including travelling time to the villages (10 hours per day)	50
Total Hours	92

Source: Authors.

Table 4. Monetary Requirements

Activity	Cost	
	Zambia Kwacha (ZMW)	U.S. Dollar (USD)
Training	6,500	650
Field Work	88,144	8,814
Total	94, 644	9,464

Source: Authors.

Other costs included allowances for the enumerators and the supervisors during the three-day training. A total of six enumerators and three supervisors were required to carry out the survey for 148 respondents over a five-day period. Two additional field staff from the EWAS project were used to organize project members for interviews and navigation through the district to implementation areas. The total cost of conducting the field survey was USD 9,464. This was for a period of five days for 148 participants, with three days of training. These costs were inclusive of consultancy services of the two trainers, allowances for all participants (IAPRI staff, enumerators, PAM supervisor, and EWAS field staff), stationary, and transport costs.

An additional vehicle was obtained from the EWAS project and fuel was provided by IAPRI to facilitate field work.

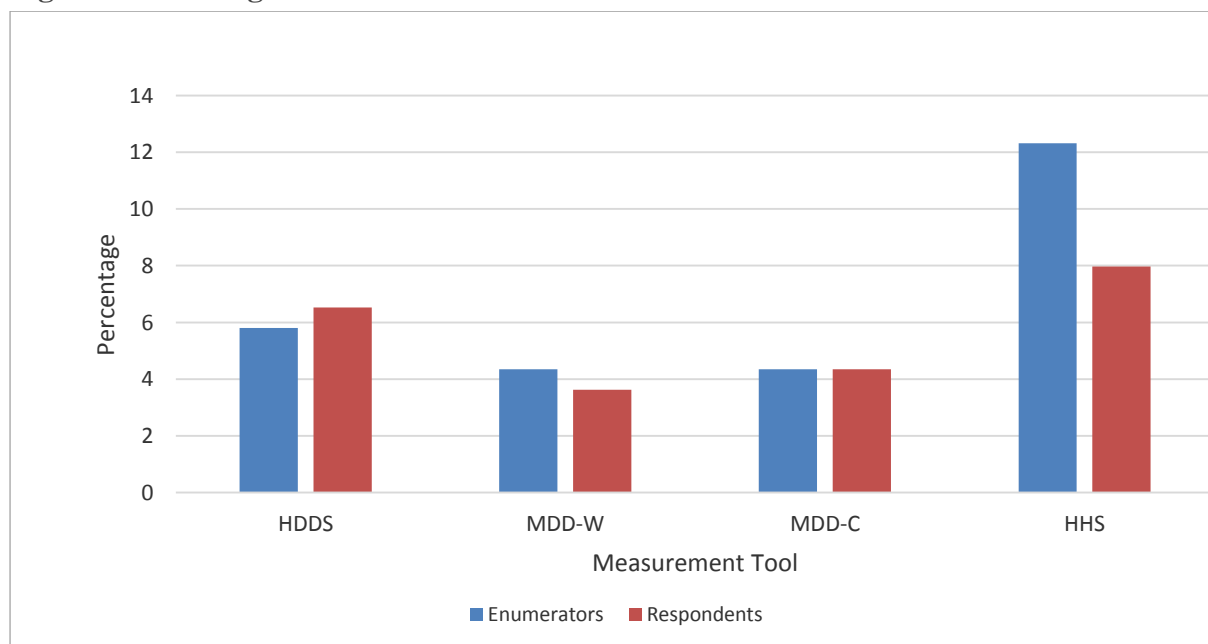
3.2. Challenges with Nutrition and Food Security Measurement Tools

The study found that the most problematic measurement tool to respond to according to the respondents' experience and the enumerators' observations was the household hunger scale as shown in Figure 3. It must be noted that although the percentages were quite low (12.3% for enumerators, 7.97% stated by the respondents), HHS was evidently the most difficult measurement tool to respond to by both the respondents and enumerators.

3.2.1. Household Hunger Score

The enumerators noted that when they asked respondents to recall the hunger situation in their households, 12.3% of the respondents had difficulty recalling incidents of hunger the previous month. They cited the one-month recall period as being too long (see Box 1), and households that had high incidences of hunger found it difficult to recall the number of incidents they had experienced because of how regularly they occurred.

Figure 3. Challenges with Nutrition Measurement Tools



Source: Authors

Box 1. Enumerator's Observations on HHS

“The respondent found it difficult to remember the hunger events as isolated because of regularly having insufficient food in the household.”

“The respondent’s recollection of hunger was difficult and her understanding of hunger was having only vegetables with nshima so she found it difficult to reconcile hunger as having no food completely.”

“Because a month is really a long time to remember, she had problems answering the question.”

“The respondent was not clear with the question of inadequate food or complete hunger.”

The follow up questions on different levels of hunger such as a household member not eating in the evening because food was not sufficient or not eating the whole day because food was insufficient were viewed as repetitive and not necessarily two different questions. The understanding of what hunger meant also seemed to differ from one household to another. In Box 1 are some of the observations from the enumerators on the difficulties faced by respondents on questions for computing the household hunger scale.

When asked to recall the hunger situation in their households the previous month, about 7.97% of the respondents stated they had difficulty answering the question. Interestingly, one respondent stated that it might be difficult to be completely truthful about their household hunger situation. Some of the other respondents felt that remembering hunger incidences from a month ago was difficult as too much time had passed. Another challenge noted by the respondents in giving responses on the HHS was the complexity in answering the follow up questions. Yet another difficulty experienced were instances where hunger was consistently prevalent in the household. One respondent stated that she could not clearly remember the number of times they had hunger incidences because most of the time, they had insufficient food in their household. Box 2 shows some of the responses from the respondents on the HHS.

Box 2. Respondent’s Experience with HHS

“The question is difficult to answer because you anticipate being given food when asked such a question so being truthful can be difficult.”

“The questions are too similar and difficult to answer.”

On the contrary, one respondent commented saying:

“If you have suffered (gone hungry), it is very easy to remember such bad events.”

3.2.2. Household Dietary Diversity Score

When asked whether the respondents found it easy or difficult to recall what their households had eaten the previous 24 hours, the enumerator’s observations showed that only 5.8% of the respondents had difficulty recalling what their households had consumed the previous 24 hours. The main reasons cited included absence from home during recall period as well as disregarding/forgetting foods eaten by children within the household (see Box 3).

Box 3. Experiences with HDDS

Enumerator's Observations

"She did not consider what the younger children ate as food, later on after probing, she mentioned the foods."

"The woman spent most of her day in the field so she did not know for sure what the other members ate but the child she lived with helped."

Respondents Experience

"Why would someone be asking such a question? If you say you did not eat certain food, will they help you?"

"When children eat foods within the household that they are not permitted, they hide e.g. green mangoes."

"It is not easy to remember every food eaten by everyone in the household."

Feedback from the respondents showed that about 6.5% of the respondents had difficulty answering this question. They mainly attributed this difficulty to not remembering every single thing that was eaten in the household, particularly the men and children and suspicions as to what the intentions of being asked such a question were. Box 3 shows the direct quotes from the enumerators and the respondents.

3.2.3. Minimum Dietary Diversity for Women

When asked if the respondents found it easy or difficult to recall what they ate the previous 24 hours, only 4.3% of the respondents were reported to have had difficulty recalling what they ate. The reasons cited by the enumerators for this were the women forgetting what they ate while others found it difficult to be truthful about what they ate. One enumerator noted that: *"She tended to forget what she ate together with everyone. It is as if she felt guilty that she ate more types of food than the rest of the family."*

Another comment that was noted was the difficulty in the respondents acknowledging the differences in the questions on household consumption and that consumed by the woman only. A comment on the same was that: *"It was confusing for her to answer because she felt that the question was not very different from the previous one on household dietary diversity."*

An estimated 3.6% of the respondents indicated having difficulty responding to the question on what they ate the previous 24 hours. The main reason cited was simply difficulty in remembering every single item of food eaten.

3.2.4. Minimum Dietary Diversity for Children

When asked whether the respondents found it easy or difficult to recall what their child ate the previous 24 hours, the enumerators reported that only 4.3% of the respondents had difficulty recalling what the child ate the previous 24 hours. The reasons were mostly around the women forgetting foods they considered as *small quantities* eaten outside of the main meals, being away from the child the previous day and possibly shame of being unable to provide food to the child in instances where the child hardly ate or did not eat anything at all.

“She showed a lot of resistance giving a response. Perhaps she was ashamed to state that the child had not eaten any solid food the whole day the previous day.”
“She could only remember what the child ate when recording how the food was prepared.”

Similarly, 4.3% of the respondents stated that they had difficulty answering the question on what the child had eaten the previous 24 hours. One respondent felt that the question was long and confusing (because of being asked about the household and herself previously).

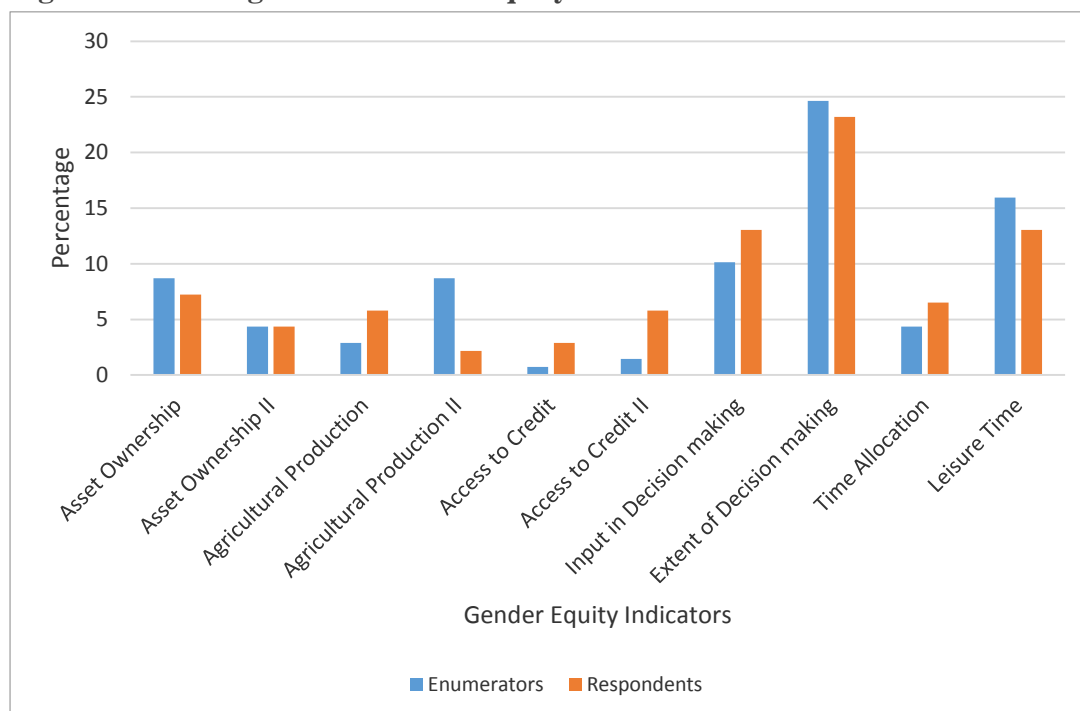
3.3. Challenges with Gender Equity Indicators

Questions on gender equity were designed to capture information on all the five domains of the WEAI. The questions included:

- Decision making
- Leadership
- Women’s asset ownership/Access
- Time allocation
- Agricultural production and control of income

The study found that the most difficult questions as observed by the enumerators as well as reported by the respondents were those relating to decision-making and leadership. Specifically, the questions of “How much input does the respondent have in decision making on agricultural income?” and “To what extent does the respondent feel they can make their own personal decisions on agricultural activities?” The other difficult question was the question of whether the respondent was satisfied with the amount of leisure time they had. As shown in Figure 4, the respondents’ self-assessment of difficulty of responding to the questions and the enumerators’ observations of the difficulties showed a similar trend for all the questions.

Figure 4. Challenges with Gender Equity Indicators



Source: Authors.

3.3.1. Decision Making Questions

The questions on decision-making were the most difficult to answer by the respondents. The challenge observed was mainly inability to understand what *extent* meant in the context of decision-making. Estimating *extent of decision-making* was especially seen to be problematic where decisions were made jointly. In addition, the enumerators noted that the dynamics of the household played a role in the respondents' ability to accurately tell the extent of their decision-making.

For female-headed households, the enumerators found that it was much easier for the respondents to explain the extent of their decision making because they practically made all the decisions in the household.

When the enumerators asked the respondents if they thought other women would find it difficult to answer the questions on who made the decisions and the extent of their participation in decision making in agricultural production, they observed that 24.6% of the respondents thought they would find it difficult answering these questions. Reasons such as cultural norms and fear of being viewed as too aggressive were the prominent explanations as to why they would have difficulty with this question. Box 4 shows some of the observations by the enumerators on the respondents' experience with questions relating to decision making.

Similar to observations made by the enumerators, the respondents also found the question on how much input in decision making the respondent had to be problematic. The reason that was commonly given for why the questions were difficult to answer was that it was not very obvious who made decisions about what to grow because a lot of the time, decisions were made jointly between husband and wife. Another respondent stated that since she was a member of EWAS and received seed from the project, she made the decisions.

"I decide on crop processing and sale of these products as well as what to do with the income."

They also mentioned that asking questions about household dynamics was intrusive. The respondents were then asked questions about whether they thought it would be easy or difficult for other women to answer the questions on who made the decisions and the extent of their participation in decision making in agricultural production. About 23.2% of the respondents thought that other women would find it difficult to answer these questions.

Box 4. Enumerator Observations on Decision-Making

"She found it difficult to answer this question because she knew that her husband was in the house nearby and may have been listening."

"The question on extent of decision making was difficult to answer because maybe the respondent saw it as a challenge to her husband's authority."

"Cultural norms mean that women would think they will be looked at as disrespectful to their husbands if they said they took a bigger part in decision making."

"Most of the women regard their husbands as the head, and automatically the decision maker."

"The question on who made primary decisions on production was difficult for the respondent to answer. She was not free to say that she made all the decisions and the husband follows."

"Primary decision maker questions were hard for the respondent to answer because she thought she might be disrespecting her husband."

The respondents overwhelmingly stated that household dynamics would play a crucial role as to whether or not the person being interviewed told the truth. The respondents thought that issues of gender dynamics in the home were sensitive and could potentially bring about conflict.

One respondent who was able to speak English stated that it was much easier to understand what ‘extent’ meant in English in comparison to its interpretation in local language. This in itself would be an obstacle to getting accurate responses from the respondents.

Interestingly, one respondent noted that as a member of EWAS, she had been trained in gender relations within the home and this allowed her to be able to freely make decisions in her household. Box 5 summarizes the direct quotes of the respondents on decision-making.

Box 5. Respondents Experience with Decision-Making Questions

“It makes someone wonder why someone would want to know your household dynamics. What are their intentions?”

“I was not comfortable with the way the question was coming out. Wife and husband make decisions together which makes it difficult to answer the question.”

“There is intimidation in telling the truth because they may think they would be judged that the woman runs the home or only the man runs the home.”

“I let him make the decisions because I fear him. If I protest, it can bring verbal conflict in the household.”

3.3.2. Time-Related Questions

As observed by the enumerators, the most common difficulty was with regards to the question on satisfaction with the amount of leisure time the enumerators had was failing to understand what the term leisure meant (even after translating the word), which was commonly mistaken for resting (see Box 6). Another difficulty was in the rating of the amount of time. About 15.9% of the respondents had difficulty answering the question.

The respondents were also asked if it was easy or difficult to answer the question on their level of satisfaction with available time for leisure activities. Responses indicated that the question was difficult to understand and that it needed to be revised. A total of 13% of the respondents stated that they had difficulties answering the question on satisfaction with leisure time.

Box 6. Experiences with Leisure Time Questions

Enumerators’ Experience

“The respondent talked about cycles of having a lot of work to do and then very little through the agricultural season, so stating whether they found time for leisure activities was difficult.”

Respondents’ Experience

“It is difficult to assess the amount of resting time because the afternoons are usually free because it is so hot. You have no choice but to rest meaning leisure time is actually there even if we have a lot of work to do.”

“Time for friends or leisure is relative so it is hard to tell what leisure time really is.”

“It is difficult to explain if leisure time is adequate.”

3.3.3. Questions on Asset Ownership

A recurrent concern noted by the respondents was that being asked questions about land access was perceived as a land ownership issue, which they were not comfortable disclosing. Other respondents were not aware that there were other types of land outside of customary land, so asking about the type of land they had was difficult for them to understand. The enumerators also observed that some of the respondents were uncomfortable, particularly on the question about where they acquired the land from.

When asked whether the respondents found it easy or difficult to state the type of assets that they owned, for the most part, the answering was easy and straightforward.

From the respondent's perspective, it was culturally inappropriate to be asked about land type and access. There was also general suspicion on why someone would be making enquiries on land types. Box 7 gives some of the responses from the enumerators and the respondents. Some respondents mentioned that full disclosure of assets could potentially lead to land grabbing. Questions on access to land/equipment were also problematic for some respondents especially for group owned assets where the respondent rarely had access to, even when according to the group rules, all group assets should be accessed by all members.

Box 7. Experiences with Asset Ownership Questions

Enumerators' Experience

"The respondent inherited land from her late husband and found it difficult to disclose because she feared the land would be grabbed from her."

"The question on land type was hard for her to understand. She also stated that she was only aware of one type of land, customary land."

Respondents' Experience

"Our fields are inherited so it is shocking to be asked a question about where you acquired the land you use to farm because that is our culture."

"The one where you ask where one got their land is difficult to answer. Because it is strange to ask where it is from."

"Questions on the types of assets were difficult because the land is inherited hence it is difficult to say it is owned because the land can be grabbed."

"I didn't know if something nice would be given to us depending on our answers."

"Some of the assets are for the community so I cannot really say that they belong to me, making this question difficult."

3.3.4. Questions on Women's Access to Credit

The question on whether the respondents had taken any loans from several sources in the 2015/16 agricultural season was particularly difficult to capture. Almost all the respondents indicated that they did not borrow any money from any of the listed sources in the question. There was a common perception by respondents that if they stated that they had borrowed some money, they would not have access to any other loans or they would be punished for defaulting in case they did that. Even with enumerators clarifying this aspect, only about 1% of the respondents indicated that they had borrowed any money. Other responses included:

"Because we don't know if you are giving us loans or not, it is difficult to answer the question. If we say we borrowed, you may not lend us money."

A further question was asked on whether the question on credit was embarrassing. The enumerators observed that only 1.4% of the respondents thought it was. One enumerator observed that:

“Upon hearing the question, the respondent laughed (feeling embarrassed) while answering this question.”

Another enumerator observed that:

“The respondent looked uncomfortable responding and she did not do so with confidence.”

According to the respondents, questions on credit were embarrassing. One respondent said that:

“It is very embarrassing because you think that the interviewer will know about your credit.”

3.3.5. Questions on Time Allocation

When asked how the women allocated time to activities they did during the previous 24 hours, some had difficulty recalling all the events they were engaged in. One enumerator reported that:

“The exact timings of the activities were difficult for the respondent to recall but not the activities themselves.”

3.4. General Observations

3.4.1. Socio-Cultural Norms

Socio-cultural norms did influence responses especially those relating to decision making because culturally, the husband is the head of a home in the Zambian setting and is assumed to make all major decisions within the household. Because of this, even though that is not true for some households with the woman taking the lead in decision-making, women tend to be reluctant to tell the true situation fearing that they will be looked at as being too aggressive/not loyal to her husband. Also, anything that would be perceived as talking negatively about the husband would not be easily vocalized. Additionally, disclosing assets, especially land, is seen to be culturally inappropriate for some respondents.

Another problem was the distractions by other family members or visitors during the interview. Culturally, it is impolite to ask a visitor or a family member who just walks in to stay away from the conversation. There was general distraction by the presence/absence of family members during the course of some interviews despite the enumerator’s efforts to send them away. One respondent dramatically became less detailed in answering the questions when the husband appeared during the course of the interview and he started responding on her behalf even when he was told that the focus of the study was women. Another respondent insisted that she needed her husband to be there in order for any questions to be answered.

It was, however, observed that the interviews were not affected by whether the enumerator was male or female.

3.4.2. Length of the Interview

Some respondents were seen to have given hasty answers in some instances because they were time constrained during the interview. These time constraints included household chores like cooking and cleaning as well as personal hygiene (bathing) and being found in their work environment. One enumerator noted that:

“The interview was conducted at her office so we had to rush through the interview; perhaps it would have hindered detailed explanations of her thoughts on some of the questions.”

3.4.3. Seasonal Timing of the Interview

The interview was conducted in September, a dry season and a time that most agricultural households experience inadequate food provisions (CSO/MAL/IAPRI 2012 and 2015). It was noted that about 3.6% of the respondents could have given skewed responses because they anticipated food aid. One enumerator noted that:

“Even after explaining the purpose of the interview, the respondent seemed expectant that we should be distributing food.”

This mind-set could possibly have affected responses, especially hunger and agricultural productivity questions, in that they would have under reported any gains, and over-reported hunger incidents in the hope of garnering pity to be helped.

3.4.4. Challenges Combining HDDS, MDD-W and CDDS

It was observed that during administration of the questionnaire, some of the respondents had challenges answering the three sections on dietary diversity one after the other. Some thought that the questions were repetitive and on occasion, were visibly irritated and signaled that they had already responded to the questions. Some would say what the household ate is what everyone ate that day (women and children as well) and they required gentle probing to get them to recall the foods they ate and what the child ate as well.

4. CHALLENGES WITH THE WHOLE STUDY

4.1. Enumerators' Training

The training session took three days to complete, in which two days were dedicated to training on nutrition data collection and one day for gender training. The main challenge experienced during the course of the training was translation of text to Lozi during the role-playing sessions. It was quickly established that local language dialogue is very multifaceted in comparison to English so there are many ways of expressing one idea. This in itself is not a bad thing but when put in conversation, it may slightly alter the meaning of questions that are asked. This challenge was dealt with by trying to explain, as much as possible, the different ways in which the questions in the questionnaire could possibly be phrased to avoid confusion during questionnaire administration.

Another challenge that was observed during the training was that the gender consultant was very knowledgeable on gender issues but not necessarily the WEAI. This is not unique to that particular consultant, but more an issue of the need for capacity to train on the use of the WEAI, which currently requires the use of literature as there are few WEAI specialists in the country.

4.2. Distance and Terrain

Senanga is 700km from Lusaka and it takes about nine hours to get there by road. The area is dominated by sandy soil. The sandy terrain can be particularly treacherous to travel when the driver of the vehicle is unfamiliar with sandy terrain. The EWAS project areas were on average over 50km away from the town of Senanga making travel time a serious consideration to factor in.

5. CONCLUSION AND RECOMMENDATIONS

Several lessons have been learned from the field-testing of measurement tools for gender equity and nutrition impacts of agricultural interventions in the Zambian context. It is clear from the relatively low percentages of respondents who had difficulties in answering the questions that the gender equity and nutrition measuring tools tested are applicable without much difficulty in the Zambian context. Mostly, the challenges faced by some respondents in responding to the questions on the tools relate to: general lack of understanding of the questions; in the case of the extent of decision making, understanding what “extent” meant (even after translating to local language); respondents’ perceptions and expectations from the interview; socio-cultural influence; poor memory for recall questions; and questionnaire length. Considering that none of the respondents had gone beyond the twelfth grade, and that the mean level of education was grade seven, to a large extent, the low levels of education affected the level of understanding of some questions, the quality of responses and recalling food consumption and time use in the past (inability to tell time). In addition to these challenges, the cost of implementing the tools turned out to be higher than expected because of the sandy terrain, bad road infrastructure, and long distances between the villages given that Zambia, and the Western Province in particular, has low population density. Along with this conclusion, we recommend that future use of the tools should take into account the following to measure impact more effectively:

1. Collecting data on different dietary diversity indicators in one questionnaire should be avoided as this confuses the respondents to think they are repeating the same responses.
2. Modifying the questions on the extent of decision making to include specific indicators that measure the extent of input in decision making by a household member, given that estimating extent of decision-making was one of the most difficult questions as observed by the respondents.
3. Timing of data collection. It should not be conducted during the season of lean food supply as expectation of food aid by the respondents from the interview was evident. This influenced how certain questions were answered. Additionally, project interventions should include training on food consumption and time recall to make it easier for the respondents to answer questions with recall periods.
4. Project implementation should prepare the beneficiaries for impact monitoring and evaluation. For example, respondents should be advised to pay attention to what they and their household members consume or what activities they carry out on a daily basis.

ANNEX

ANNEX 1. ENUMERATORS' AFTER-INTERVIEW QUESTIONNAIRE

Code	Question	Response
N01	Did the respondent find it easy or difficult to recall what their household had eaten the previous 24 hours?	Easy (Skip to N03) Difficult
N02	Why was it difficult? (Write response down)	
N03	Did the respondents find it easy or difficult to recall what they ate the previous 24 hours?	Easy (Skip to N05) Difficult
N04	Why was this difficult for them? (Write response down)	
N05	Did the respondents find it easy or difficult to recall what their child ate the previous 24 hours?	Easy (Skip to N07) Difficult
N06	Why was it difficult? (Write response down)	
N07	Did the respondents find it easy or difficult to recall the hunger situation in their household the previous month/ 4 weeks?	Remembered well (Do not ask N08) Remembered poorly
N08	Why was it difficult to remember? (Write response down)	

Code	Question	Response
WOMEN'S ASSET OWNERSHIP		
AO01	Did the respondents find it easy or difficult to state how they acquired the land and what type it was?	Easy (Skip to AO03) Difficult
AO02	Which question was most difficult and why? (Write response down)	
AO03	Did the respondents find it easy or difficult to state the types of assets that they owned?	Easy (End Questioning) Difficult
AO04	Why was it difficult?	
AGRICULTURAL PRODUCTION		
AP01	Did the respondents find it easy or difficult to state crop, vegetable, and fruit they produced in the 2015/2016 agricultural season? How well did they remember which agricultural activities they participated in in the last 12 months? (Record and write response down)	Remembered well.... Remembered poorly...
AP02	Were there any questions you asked the respondents about production that were difficult for them to answer?	Yes No(Skip to AP05)
AP03	What question(s) were these and why were they difficult? (Write response down)	
WOMEN'S ACCESS TO CREDIT		
AC01	You asked the respondents whether they had taken any loans or borrowed cash/in-kind from several sources in the 2015/2016 agricultural season. How was this question for them? Was this question easy or difficult?	Easy (Skip to AC03) Difficult
AC02	Why was it difficult to answer this question?	
AC03	Do they think being asked about their borrowing activities was embarrassing?	Yes No (End questioning on credit)
AC04	Why do you think it was embarrassing?	

Code	Question	Response
	(Write response down)	
WOMEN'S DECISION MAKING AND LEADERSHIP		
DM01	Did the respondents find it easy or difficult to state who made the decisions on what they grew and how much input they had in that decision?	Easy (Skip to DM03) Difficult
DM02	Which question was difficult and why? (Write down response)	
DM03	Do you think other women would find it difficult to answer the questions on who made the decisions and the extent of their participation in decision making in agricultural production?	Yes No (Skip to next section)
DM04	Why do you think there would be difficulty?	
WOMEN'S TIME ALLOCATION		
TA01	Many people find it difficult to recall every activity done in a day. How well were the women able to remember which specific activities they were doing at every time in the previous 24 hours? (Record and write response down)	Remembered well Remembered poorly
TA02	Did the respondents find it easy or difficult to state whether they found time for leisure activities?	Easy (End interview) Difficult
TA03	Why was it difficult for them to answer? (Write response down)	
SOCIAL-CULTURAL ASPECTS		
Did you observe any issues regarding the way the society is structured which affected the way the respondents answered the questions?		Yes No
If yes, what issues did you observe? Explain why.		
SC01a	My dress	
SC01b	My age	
SC01c	My gender/sex	
SC01d	My approach to the village	
SC01e	The time of the interview	
SC01f	The season of the year	
SC01g	Age of the of the respondent	

Code	Question	Response
SC01h	My language/accent	
SC01i	Location of the interview	
SC01j	Whether or not interview appointment was made	
SC01k	Presence or absence of other family members in the interview	
SC01l	Cultural or religious sensitivity	
SC01m	Corruption related matters	
SC01n	Other (explain)	

ANNEX 2. RESPONDENTS' AFTER-INTERVIEW QUESTIONNAIRE

Code	Question	Response
N01	Earlier, you were asked to recall what your household had eaten the previous 24 hours. How was this question for you? Was it easy or difficult to answer?	Easy (Skip to N03) Difficult
N02	Why was this difficult? (Write response down)	
N03	Earlier, you were asked to recall what you ate the previous 24 hours. How was this question for you? Was it easy or difficult to answer?	Easy (Skip to N05) Difficult
N04	Why was this difficult? (Write response down)	
N05	Earlier, you were asked to recall what your child ate the previous 24 hours. How was this question for you? Was it easy or difficult to answer?	Easy (Skip to N07)
N06	Why was it difficult? (Write response down)	
N07	Earlier, you were asked to recall the hunger situation in your household the previous month/ 4 weeks. Was it easy for you to remember whether your household had gone hungry or not?	Remembered well (Do not ask N08) Remembered poorly
N08	Why do you think it was so difficult to remember? (Write response down)	

Code	Question	Response
WOMEN'S ASSET OWNERSHIP		
AO01	Earlier, you were asked about land, how you acquired it, and what type it was. How were these questions for you? Were they easy or difficult to answer?	Easy (Skip to AO03) Difficult
AO02	Which question was most difficult and why? (Write response down)	
AO03	Earlier, you were asked about the types of assets that you owned. How were these questions for you? Where they easy or difficult to answer?	Easy (End Questioning) Difficult
AO04	Why was it difficult?	
AGRICULTURAL PRODUCTION		
AP01	Earlier you were asked about crop, vegetable, and fruit production in the 2015/2016 agricultural season. Many people find it difficult to recall activities done a long time ago. How well did you remember which agricultural activities you have participated in in the last 12 months? (Record and write response down)	Remembered well.... Remembered poorly...
AP02	Were there any questions you were asked about production that were difficult for you to answer?	Yes No(Skip to AP05)
AP03	What question(s) were these and why were they difficult? (Write response down)	
WOMEN'S ACCESS TO CREDIT		
AC01	Earlier you were asked if you had taken any loans or borrowed cash/in- kind from several sources in the 2015/2016 agricultural season. How was this question for you? Was this question easy or difficult?	Easy (Skip to AC03) Difficult
AC02	Why was it difficult to answer this question?	
AC03	Do you think being asked about your borrowing activities is embarrassing?	Yes No (End questioning on credit)
AC04	Why do you think it is embarrassing? (Write response down)	
WOMEN'S DECISION MAKING AND LEADERSHIP		
DM01	Earlier, you were asked who makes the decisions	Easy (Skip to DM03)

Code	Question	Response
	on what you grow, how much input you have in that decision. Was it easy or difficult for you to answer these questions?	Difficult
DM02	Which question was difficult and why? (Write down response)	
DM03	Do you think other women would find it difficult to answer the questions on who makes the decisions and the extent of their participation in decision making in agricultural production?	Yes No(Skip to next section)
DM04	Why do you think there would be difficulty?	
WOMEN'S TIME ALLOCATION		
TA01	Many people find it difficult to recall every activity done in a day. How well were you able to remember which specific activities you were doing at every time in the last 24 hours? (Record and write response down)	Remembered well Remembered poorly
TA02	Earlier you were asked how satisfied you were with available time for leisure activities like visiting neighbors, listening to the radio etc. How was this question for you? Was this question easy or difficult to answer?	Easy (End interview) Difficult
TA03	Why was it difficult for you to answer? (Write response down)	

REFERENCES

- Alkire S., R. Meinzen-Dick, A. Peterman, R. A. Quisumbing, G. Seymour, and A. Vaz. 2013. *The Women's Empowerment in Agriculture Index*. Oxford Poverty and Human Development Initiative Working Paper No. 58. Oxford, UK: University of Oxford.
- Benhammouche, Z.A. and A.M. Odenigbo. 2015. *Mainstreaming Nutrition in IFAD-Supported Programmes in Zambia*. Policy Brief. Rome: International Fund for Agricultural Development.
- Chapoto, A., B. Chisanga, A. Kuteya, and S. Kabwe. 2015. *Bumper Harvests a Curse or Blessing for Zambia: Lessons from the 2014/15 Maize Marketing Season*. IAPRI Working Paper No. 93. Lusaka, Zambia: Indaba Agricultural Policy Research Institute.
- CSO (Central Statistical Office). 2015. *Zambia Demographic and Health Survey 2013-14*. Lusaka, Zambia: Central Statistical Office.
- CSO/MAL/IAPRI. 2015. *2012 and 2015 Rural Agricultural Livelihood Surveys*. Lusaka, Zambia: CSO/MAL/IAPRI.
- FAO. 2012. *Gender and Nutrition, Issue Paper-Draft*. Rome: FAO.
- FAO and FHI 360. 2016. *Minimum Dietary Diversity for Women: A Guide for Measurement*. Rome: FAO.
- Food and Nutrition Technical Assistance Project (FANTA). 2008. *Guidelines for Measuring Household and Individual Dietary Diversity, Version 4*, FAO Nutrition and Consumer Protection Division, EC/FAO Food Security Information for Action Programme and the Project. Rome, Italy: FANTA.
- Herforth, A., F.G. Nicolo, B. Veillera, and C. Dufour. 2016. *Compendium of Indicators for Nutrition-Sensitive Agriculture-Final Draft June 2016*. Rome, Italy: Food and Agriculture Organization of the United Nations.
- Longley, K. and S. H. Thilsted. 2015. *Food Nutrition Security in the Barotse Floodplain System, Draft Report*. Penang, Malaysia: CGIAR Research Program on Aquatic Agricultural Systems.
- Malapit, H.J.L. and A.R. Quisumbing. 2016. *What Dimensions of Women's Empowerment in Agriculture Matter for Nutrition? Food Policy* 52. April: 54-63.
- Malapit, H.J.L., S. Kadiyala, A.R. Quisumbing, K. Cunningham, and P. Tyagi. 2015. *Women's Empowerment Mitigates the Negative Effects of Low Production Diversity on Maternal and Child Nutrition in Nepal. The Journal of Development Studies* 51.8: 1097-1123. Accessible at: <http://dx.doi.org/10.1080/00220388.2015.1018904>.
- Programme Against Malnutrition (PAM). 2012. *Empowering Women in Senanga and Gwembe Districts through Agricultural Support Project Proposal: 2012-2015*, Project Document. Lusaka, Zambia: PAM.

- Quisumbing, A., R. Meinzen-Dick, J. Njuki, and N. Johnson. 2013. *Gender, Agriculture and Assets: Learning from Eight Agricultural Development Interventions in Africa and Asia*. Washington, DC: IFPRI.
- von Grebmer, K., J. Bernstein, D. Nabarro, N. Prasai, S. Amin, Y. Yohannes, A. Sonntag, F. Patterson, O. Towey, and J. Thompson. 2016. *2016 Global Hunger Index: Getting to Zero Hunger*. Bonn, Washington DC and Dublin: Welthungerhilfe, International Food Policy Research Institute, and Concern Worldwide.
- Zambia Country Analysis. 2015. *Zambia Country Analysis Summary*. Lusaka: United Nations Country Team in Zambia.