

Women's Diets, Roles in Agriculture, and Nutrition: Findings from Nepal, Uganda and Tanzania

Webinar Transcript

Robin Shrestha

Good morning, afternoon, and evening. Thank you all for joining today's webinar to learn more about Women's Diets, Roles in Agriculture, and Nutrition: Findings from Nepal, Uganda, and Tanzania.

My name is Robin Shrestha and I'm the regional project manager for Asia and Africa at the Friedman School of Nutrition and I will be your MC today. As more attendees are joining the webinar, I will begin by going over some of the housekeeping.

I would like to direct all attendees to a new function on this zoom webinar. At the bottom of your screen, you should see a chat icon and a Q&A icon. Please use the chat feature to engage in relevant conversation with the other attendees. If you have a question for one of the panelists, please use the Q&A feature. Panelists will respond to questions in the Q&A as they are able to.

We have allotted the final 20 minutes of this webinar for Q&A, at which point the panelists will respond to any remaining questions from the audience.

If you are experiencing technical difficulties, send a message in the chat to panelists so that our technical support staff can work with you to help resolve any technical issues.

This webinar is being recorded and will be made available on the [Innovation Lab for Nutrition](#) and the [USAID Advancing Nutrition](#) websites. You can also register for upcoming webinars and view previous recordings and slide decks on our websites.

We will repeat these technical housekeeping items in the chat throughout the webinar as people may be joining in at later times.

So I will begin the webinar today by introducing our moderator, Dr. Eileen Kennedy. Dr. Kennedy is a former dean of the Friedman school and is currently a professor at the school. Dr. Kennedy's research interests include assessing the health, nutrition, diet, and food security impacts of policies and programs, nutrient density and diet diversity, and agriculture-nutrition linkages. She has been a member of the High Level Panel of Experts [HLPE] on food security and nutrition of the UN Committee on World Food Security [CFS], and a member of the UN SCN Advisory Group on Nutrition. She founded and was the first executive director of the USDA Center for Nutrition Policy and Promotion. She created the Healthy Eating Index, which is used as a single summary measure of diet quality.

Dr. Kennedy will give a brief background on the universal law for nutrition, our research, and the webinar series. She will then begin the webinar by introducing our panelists. Dr. Kennedy, pleasure to have you here, and over to you.



Eileen Kennedy

Thank you, Robin. It is my pleasure to welcome everyone to this latest webinar on women's diet: Women's Diets, Roles in Agriculture, and Nutrition: Findings (from three countries): Nepal, Uganda and Tanzania. And this the series of this particular webinar is being sponsored by the USAID Feed the Future Nutrition Innovation Lab. Go back to the first slide, please.

And you'll see here that the Nutrition Innovation Lab is working in a wide variety of countries around the world (the next slide) with a very broad range are both global and local partners.

In addition, if we look at the next slide, there are a number of US government partners who have been involved in the Nutrition Innovation Lab.

And finally, in the next slide, we see that there's an enormous amount of collaborators and support in all the countries in which the NIL colleagues work.

Now again, it is my pleasure to introduce the three panelists, the three presenters, and I have to say it is always difficult for me to introduce somebody who I know very well. And in this case, Dr. Keith West. I don't even want to say how many years but Keith and I have known each other many, many, many years. We've worked on projects, initiatives together and this includes the Nutrition Innovation Lab. So let me keep the introduction brief. Keith is a professor at the Johns Hopkins Bloomberg School of Public Health. He has published widely in nutrition. And I always like to remind people that Keith's friends, colleagues, and students affectionately refer to him as Dr. Vitamin A.

Our next presenter is Alexandra Bellows, who's a PhD student, again at the Johns Hopkins Bloomberg School of Public Health. Alexandra's research concentrates on the linkages between agriculture, food environment, and diet quality.

And the third presenter is on Nassul Kabunga, recently with the International Food Policy Research Institute. Currently, he is an evaluation research economist with the Friedman School of Nutrition Science and Policy, in addition to being a consultant on the Uganda National Information Platforms for Nutrition. And with that I will hand it over to Keith as our first presenter.

Keith West

Thank you. Eileen and hello to everyone. It's a pleasure to be here and to be able to share with you some of the exciting data that has been collected through the Feed the Future Nutrition Innovation Lab activities in Nepal, with the PoSHAN Community Studies that our Hopkins team has been leading and implementing with partners in Nepal, with our colleagues at Tufts University over the past decade almost. The title of this talk is really also the end message, so if you if you have to tune out, just look at the first slide, and you'll have gotten the primary message of this presentation.

That if it's grown in the household mothers eat more; without necessarily implying a direct causal relationship, the associations you'll find are quite convincing. As a background, women are at high risk in South Asia of an inadequate diet.

They are at high risk of micronutrient deficiencies because of an inadequate diet, poor dietary diversity, and in terms of amounts of nutritious food. A chronic problem that we will see when we put data behind that issue: Nepal is also in the midst of a nutrition transition as modest increases in expendable income become available and the flood of snack foods and markets across low to middle income countries that we're all aware of. Home food production, though, offers a direct pathway for improving the diets of women—and we know that—but it's very nice to have data that can test and reveal the strength and the direction, the robustness, and the potential responsiveness to programs along this pathway. And so that's the focus of this presentation. Next slide.

Just as a regional and global view, a recent paper from Bourassa et al, showing micronutrient deficiencies in different regions of the world and the box indicates the regional pattern of micronutrient deficiencies in Southeast Asian countries, which reflect a poor diet in our own work in southern Nepal. Slide.

We see many micronutrient deficiencies in women who are pregnant, and the message here is the more you look, the more you find, and what you find is not the same. And so, it reflects the composition of diet. It reflects the foods that are being consumed at the time of assessment, but also throughout the year, because these are chronic issues. Slide.

This is a finding from a study that we carried out in the Terai of Nepal several years ago throughout the entire year, doing seven day food frequencies of pregnant women year round, in several thousand women, and showing the monotony of the diet throughout the year. Also that rice is the staple crop and is eaten twice a day, and the pulses might be eaten once to twice a day, potato is popular. And then at the along the bottom, there are a bunch of lines that reflect animal source, fruits and vegetables, and their frequency is low throughout the year, and the continuity of that throughout the year gives you confidence about one time of the year, if you happen to be assessing the diets of such a population. Next slide.

Also, keep in mind there's seasonality in the agricultural calendar. These are different foods shown in the pre-monsoon, monsoon, and post-monsoon season, and we need to be aware, when we ask about dietary intakes, that we need to be aware of the season that we're in. I've noted tomatoes and cauliflower there because the study that I'm going to present, it's been done in the monsoon season. And so, what we see reflects some of that that seasonality. Next slide.

Our conceptual diagram is one that's driving our studies, is going from agriculture to nutrition pathways, that if there are crops and gardens and markets, that can lead to better household food security. When there's some wealth, there are purchases that happen that can affect dietary intake and other aspects of life that can affect nutrition and health of women and children.

And when you collect information along those lines, you can inform policies and programs that can affect each of those levels of input and that is where our PoSHAN Community Studies comes into play. This is a study that was aimed to assess the mid-year, the monsoon season mid-June to mid-September, in 2013-2016, in a nationally representative sample of sub-districts in Nepal VDCs. Agricultural practices with respect to what foods are grown, animal foods, and crops in the rainy and the dry season, market availability, household food security, indicators, foods purchased in the past month, dietary intake in the past week with a seven day food frequency, and we also measured nutritional status—all in the effort to construct pathways that can be examined and quantified that can lead from agriculture to nutrition. Next slide.

In this sample, this just a map of Nepal and the sampled sites that we did our studies in over the years. There are seven systematically sampled sites across the mountains, seven across the hills, and seven across the Terai with about 5000 households examined and studied in each year, each mid-month, mid-year, each monsoon season, and that gives us a rather stable number to look at from year to year. These can be found in Klemm RDW et al.

The aims were to summarize, then, a mid-year seven day food frequency pattern of mothers across these regions and nationally, and to estimate the direction and the strength, and the stability of association from year to year of how maternal intakes relate to the growing of staple crops, animal foods, vegetables and fruits, and also expenditures on these foods in local markets that were also assessed each year. And to look at the relative merit of household food production in improving intakes. Next slide.

Our analytic approach is to take the seven day food frequency and summarize it across four years. But there was one year where we could not do the national survey, in 2015, because of a large earthquake

that struck the hills and mountains of Nepal. And so in that year we were only able to do the Terai. So I'm only going to speak about 2013, 2014, and 2016 at this time.

We took the approach of calculating odds ratios to reflect relative frequency of intakes of foods, of women and families who are producing their food, versus not producing their food at home. And looking at animal source foods and crops and also purchases, adjusted for agricultural zone, age, wealth index, and a clustering factor. We also adjusted, when we look at growing, whether we adjusted for purchasing food. And when we look at purchasing we adjust for growing of the food as well. Next slide.

This is just a slide of the numbers of households and women interviewed each of these three years. Next slide.

And this is a compilation—this is two slides—that that summarize several years of work that show the frequencies of consumption per week of women in these years that we carried out the study, rice being consumed twice a day, daal from lentils once a day, vegetable oil gradually increasing from two to three times a day. And then meat and poultry, dairy products, eggs, animal source foods one to two times a week—one to two times a week. And, as well, dark green leafy vegetables, about twice a week.

Other fruits and vegetables one to two times a week, and then non carotenoid, if we want to call them, vegetables almost one time a day, and other fruits twice a week. So, the zeros are intentional there, because those zeros are the median intakes of those other foods per week in women across Nepal for year after year. Notice at the very bottom, there are snacks that are eaten twice a week, and they compete in terms of frequency and in terms of purchases in markets with other nutritious foods. Next slide please.

When we have looked at this in a different way—we also did 24 hour recalls, but we won't go into that right now. But using that data to look at how women meet the minimum dietary diversity index—only about 35 to 40% across the country meet the minimum of consuming five or more nutritious food groups in the FAO list in the previous 24 hours. So, we are looking at a low dietary diversity population nationally. Next slide.

So with that as a background, we're going to look at a couple of foods as illustrative of not only the patterns, but also the role of growing food at home on the odds of women consuming more than those national medians. So the national median from year to year provides a normative metric, not necessarily an ideal one, but a normative metric to compare, in a relative way, the frequency of intakes of women in households that grow or raise those foods versus those households where those foods are not raised. Next slide.

So, so this is an example. This is egg intake relative to the national median in women of reproductive age. These are mothers of children, I should have said, that were assessed. So these are all women in reproductive age. And we're showing here 2013, and the odds ratio of women consuming more than the median, which is zero for eggs, if they have grown chickens that produce eggs. over the course of the year. And that's 1.85, so they're almost two times as likely to consume eggs if they have grown them. And then the orange dot is controlling for adjusting for in the model for whether they purchased eggs in the previous month. And so we see an approximately two to three fold higher odds of consuming eggs in 2013 if women are in households that have grown that food.

The right side is purchase. So if they purchase foods, this is the odds of eating more than the national median. And so people buy food to eat it. They don't always grow food to eat it because it can be sold and so forth. So you would expect, normally, the odds ratio is to be higher for purchasing the food than for growing the food, but we're focusing on growing. That's 2013.

If we go forward to 2016, on the right side, we see basically the same pattern. And I'm not showing 2014, but it mimics what we are seeing here in these two years—that if women grow chickens and produce eggs, they are more likely to eat them, and obviously also to purchase them. Next slide.

If we look at chicken and then consumption of chicken—this, the y axis—the odds ratio is going to change here because of the competence intervals that are different sizes. So, the y axis is not a constant one, and so keep that in mind. But if a household has chickens in the household—if they are growing chickens—there's a one and a half to two times increased odds of women consuming. They may not be consuming the chickens that are that are being produced at a particular time, but they are in the habit of eating chicken. They grow chicken, they eat chicken and they're more likely to have it in their diet. Obviously, that is also true if they are going out to purchase chicken in the previous month. Notice that the median is zero. So this means—growing means—eating any chicken versus, on average, no chicken during the week. And if we look at 2016 we see the exactly same pattern—different year, independent procedures, same sample sites—but a different year altogether. And we see that very same pattern, and it's true for 2014 as well. Next slide please.

We look at meats, and meat food being goat, buffalo, hogs or pork, and we look at 2013. You don't see the confidence intervals there, but they're above one. So there's a 30% to 60% increased chance of women consuming meats, if those animals are grown in the household above the median of one time per week. And if they purchase it, it's seven, eight times more likely that they are consuming above the national median.

If we look at 2016, we see the same pattern: more likely to consume if grown and, of course, purchasing. And controlling per person doesn't change these odds ratios, very much. Next slide.

Except for dairy. We see that if milk is produced, if they have animals that are producing milk, women are going to be consuming more of it above the median of two times per week, but not if they purchase them, and we think that's because they are purchasing probably for their young children, rather than for themselves. And we see that same pattern in 2016, if we go to the right—the pattern hasn't changed. So there's stability and continuity in these relationships. Next slide.

We look at some staples like rice. We see that these now, whether they're grown or purchased, they hover around one for 2013, and 2016 they hover around one as well. If we look at that, please.

There we go. And so, if I can borrow the economist's term, rice consumption is inelastic to the source of rice. The women are going to eat rice whether they grow it or don't grow it, if they don't grow it they'll purchase it. And so we see that continuity in the relationship with respect to staples. Next slide.

We see it with respect to the lentil, the daal that goes with rice, a little bit more a tendency to consume more if it's purchased. But if it's grown, it's right around one next year.

And that's true for 2016 as well. If we move on to another food—dark green leafy vegetables—we see that if the foods are grown in the household they're going more likely to be consumed by women. And that's true for growing and adjusting for purchasing—it becomes more important when you adjust that for purchasing. And if they buy, it's the same relationship. For 2016 we see expectedly, the same pattern, but the location of those odds ratios are a little bit different for purchasing—that may relate to market conditions in the year 2016 during the time when we were doing the study. Next slide.

Here's cauliflower. If it's grown up during the year, there's no increase. If you take it going back to that seasonality graph, we were in a season when cauliflower was not grown, so if they do grow during the year, it's a different time of the year and it's not affecting, necessarily, their intake right now. They want to eat cauliflower, they have to go to the markets, which are at times profuse with some of these foods, and buy it. And if they buy it, they'll consume. Next slide.

And finally example of fruit. This is papaya. Notice that the X and the Y axis is compressed here, but it's three to four times five times more likely to consume papaya, if that tree is sitting in the backyard. If they're growing papaya, in 2013, and even more so in 2016, but the pattern is stable. Next slide.

So maternal diets in Nepal, on average, are meager from year to year. There's some, if you study those 75th percentile range there's some evidence of movement forward with time. Those who are better off are going to eat more as income goes up, but basically it's two rice meals and with one with daal and one with the vegetables. With some green leafy vegetables from time to time, one animal source food every other day, fruit every other day, and oil intake is going up. 40% are chronically not—only 40% are meeting their minimum dietary diversity. So it's a meager diet across Nepal, year to year. Next slide.

But home food production is associated with a better diet. So the relative odds of mothers eating foods, more often than the national median is increased if they are from households that produce these foods, year after year, if they are growing chickens, goats, buffalo, hogs, growing vegetables, fruit, it's roughly one and a half to four times more likely that women are consuming those foods in the previous week than the national median for that year. There's my timer.

And when you adjust these odds ratios for purchasing, they shift—depending on the market, depending on the food, depending on the year—but it remains a constant relationship. And staples are eaten whether it's grown or purchased. Next slide.

This assessment approach allowed us to look at a constant season pattern of intake from year to year. So we're controlling for season—midpoint months and it's not the best season, not the worst season, it's an average of the year, so to speak, and it allows, from year to year, these patterns to be assessed for their stability and change. It does not address seasonality, one has to go... one has to do these assessments during different seasons in order to look at the seasonality of intakes, which we have done in PoSHAN, but it's not being presented today.

By assessing the same sites in a random sample nationally representative, we were able to limit the extraneous variability due to geographic location, and also using the same protocol we limit the variation due to methodological differences. The odds ratio approach, with a national median threshold, which should not be taken as a desirable equilibrium, it's just the normative for that year. It does provide an interpretable metric to evaluate the relative merits of growing foods at home in terms of how it relates to women's diets. But you could use other thresholds as well. Next slide.

So, in this talk, we've talked about crops and gardens and markets in this model, some indication of wealth with respect to the ability to purchase foods and how that relates to their frequency of intake and how that relates, then, to diet. We've kept it in that band of this model for today's presentation. It's data that encourages programs and policies that can continue to increase local food production, in the home, across the country. Next slide.

I would like to acknowledge many of the agencies, institutions, our colleagues at USAID in Washington and in Nepal, and our colleagues at Tufts University, government of Nepal, and agencies that we work with, New ERA and NTAG in Katmandu who did the field work—lots of contributors to this effort. Next slide.

Including individuals, I'd like to call out Binod Shrestha who did the analyses for this presentation and is writing a paper on these data, our advisors, the team at Hopkins and here at NTAG. Next slide. I think the next slide is the next speaker. Thank you very much, it's been a real pleasure to be with you.

Alexandra Bellows

Hi everyone, so I'm Alexandra Bellows, and I would like to thank you for the opportunity to share some of my research on the relationship between dietary diversity and agricultural diversity in a rural district in Tanzania.

I'm currently a doctoral student at the Johns Hopkins Bloomberg School of Public Health. But today I'll be presenting work that I did as a student and researcher at Harvard under the mentorship with Dr. Wafae Fawzi, who kindly gave me the opportunity to present research from our team today.

This research was done in collaboration with colleagues at the Harvard T.H. Chan School of Public Health, Ifakara Health Institute, Sokoine University of agriculture, with support from the IZUMI Foundation and Nutrition Innovation Lab. Next slide please.

The Tanzanian government has prioritized growth in agriculture to reduce poverty and improve food security, and agriculture consists of 30% of Tanzanian GDP. In addition, agriculture industry is one of the largest employers in Tanzania with 65% of adults being employed in agriculture. Most of the agriculture in Tanzania is dominated by smallholder farmers, with evidence of home consumption, since on average about 35% of crops are sold at the market from the small holder farmers. Most common crops grown by smallholder farmers are maize, cassava patties, sorghum and bananas. Next slide.

So with this evidence of home consumption, myself and colleagues from Harvard, Ifakara Health, Sokoine University, and Tufts decided to explore the relationship between agriculture diversity and dietary diversity for women of reproductive age in Rufiji Tanzania. The results I'm sharing with you today are from an analysis that was recently published in the Food and Nutrition Bulletin journal earlier this year.

This was a cross sectional analysis from a baseline survey of a cluster randomized control trial which we refer to as HANU for Homestead Agriculture and Nutrition Initiative. The aim of the trial was to assess the efficacy of the homestead gardening intervention on dietary diversity.

This analysis looks at the relationship between agriculture diversity and dietary diversity prior to the start of the homestead gardening intervention. We enrolled approximately 1000 women from 10 villages and the Rufiji District, which is located about 180 kilometers south of Dar es Salaam along the coast. Villages were purposely selected from an ongoing DSS surveillance, which is highlighted in dark red region on the map.

Eligibility Criteria included households with a woman of reproductive age, at least one child less than 36 months of age, and access to land for agricultural use. Next slide.

Baseline data collection took place from August to October in 2016—which is considered to be in the harvest season for this area. After consenting to participate in the study, participants answered questions regarding household demographics, women's health, agricultural production, physical activity, women's empowerment, food security, and dietary intake.

We calculate a dietary diversity scores from a 30 day food frequency questionnaire, and foods are categorized into 10 food groups using FAO guidance for minimum dietary diversity for women. Since we're using a food frequency questionnaire and not 24 hour recall we use this questionnaire to estimate on average daily consumption.

For agricultural diversity scores, we calculated scores using two different methods that have been used in the previous literature. The data came from asking participants to list crops grown by household within the last year across all growing seasons.

First we used the crop nutritional functional richness score, which categorizes crops into seven food groups consistent with the agricultural food groups and the dietary diversity scores, and, secondly, crop species richness scores, which count the number of crops species grown by a household.

On average, households had approximately seven individuals per household. 33% of women reported no formal education, while 58% of women reported some primary education. This is an area of high food insecurity as 51% of households reported experiencing some form of food insecurity in the last month. The majority of households participating, in agriculture and average land size, was slightly less than one hectare, which is a bit smaller than the national average for smallholder farmers—farms—in Tanzania.

One third of households reported ownership of livestock with the majority of livestock owning households owning chickens.

On average, households grew three crops throughout the year from an average of 1.5 food groups. The five most common crops grown were maize, rice, sesame, cassava, and cashews, which is also consistent with the most common crops grown at the national level as well. In addition, it is not surprising that most of the crops grown could be considered a cash crop as these villages are located on a major highway, a few hours south of Dar es Salaam.

The majority of households in all villages are reported growing starchy staples, with the second highest food group ground being nuts and seeds. And as you can see from the graph below, there's a lot of heterogeneity and agriculture diversity between villages, with the two villages in the middle reporting growing the most food groups, and this will be important to note for the next slide when I talk about dietary diversity.

On average women consumed about three food groups per day with the five most common foods consumed being ugali, fried fish, okra, fresh fish, and rice. The high consumption of fish may be unique to this region of Tanzania, which is located near the Rufiji River Delta where fish is easily accessible in the market for a relatively low price.

You can see that few households across all villages reported consuming nuts and seeds, even though that was the second most reported crop food grown. There's also a lot of heterogeneity between communities, and what is potentially most surprising is the low dietary diversity in the two villages with the highest agricultural diversity. And then information from our study team and project coordinator indicate that these two villages may have been experiencing a drought at the time of baseline data collection. Therefore, there's a potential for significant crop loss or household selling of crops for monetary purposes, instead of consumption. Next slide.

We conducted a risk factor analysis, looking at agricultural factors associated with dietary diversity among women of reproductive age. Multivariate analysis, which also controlled for socio economic status, education and village, found that agriculture diversity scores that categorize crops based on food groups, ownership of livestock, participation in cash crop production, growing of pulses, and growing vegetables such as okra and tomatoes, was associated with increased dietary diversity.

Interestingly, in a separate analysis, we assess that ownership of livestock and growing of pulses, and other vegetables was associated with the consumption of the equivalent food group. We found no association existed between the ownership of livestock and meat consumption, and the growing of pulses was not associated with the consumption of pulses.

Certain pulses, such as peas, have high market value in these communities. We therefore hypothesized that these factors are influencing diet through the income pathway instead of the home consumption pathway.

On the other hand, growing vegetables in the other vegetable category, which includes okra and tomatoes, was associated with increased consumption of those vegetables. Therefore, suggesting that promotion of certain crops could increase dietary diversity through the home consumption pathway. Next slide.

Overall, we did find agricultural production diversity was associated with dietary diversity among women in this study. It should be noted that agriculture diversity, measured as number of food groups, was not the number of crops grown, was associated with higher dietary diversity. In addition, higher dietary diversity was associated with ownership of livestock, participation in cash crop agriculture, and growing of pulses, all of which suggests the income pathway may be very important to improve dietary diversity.

It also should be noted that potential gains in dietary diversity from increased agriculture diversity were small, and this is consistent with the literature and other studies that have explored the relationship between dietary diversity and agriculture diversity in East Africa. This may suggest that the promotion of agriculture diversity should be in coordination with other interventions that promote dietary diversity

and not a standalone policy. The results of this study highlight the relationship between market access and dietary diversity, which should be further explored in this context. Next slide.

Looking forward after analysis of baseline results, we decided to add a market assessment in our midline data collection. My colleague Dr Madzorera is leading this analysis and the paper is currently under review, which is very exciting. In addition, the three year trial collected end line data in August of 2019; results from midline are also under review, and end line results are currently being analyzed by our team. Next slide.

Finally, I'd like to take this opportunity to thank my colleagues at the Ifakara Health Institute, Sokoine University, and Harvard Chan School of Public Health for their help and mentorship on this analysis. In addition, I would like to thank the women who agreed to participate in this trial, and finally the Nutrition Innovation Lab and Izumi Foundation for agreeing to fund this project. I would now like to introduce Dr. Kabunga, the final speaker of this series. Thank you.

Nassul Kabunga

Okay. Thank you so much, Alexandra. My name is Nassul Kabunga. I am going to be talking about women's empowerment, cash crops, and change growth in Uganda. This is work that is being built from the analysis that we have been doing on a lot of data, really—panel data that were collected from Uganda since 2012 and we have the site so... My name is Nassul Kabunga once again and I have been working with Innovation Lab since 2012. So please, next slide.

So we know from the setup of rural systems that cash income is very important for live foods. Because cash can increase the household's capacity to purchase improves diets, which essentially improves data quality and diversity. But also cash facilitates households to be able to buy and balance essential and food items, for instance, with health, transport and housing. And for many rural agro-based households any type of their own farm produce serves as an important source of cash.

So cash, cash crops in specific towns, but also agricultural commercialization has been like promoted as a way to generate cash for broader implications and has brought up implications for welfare and nutrition. Next slide please.

Apparently the evidence on the linkages between agricultural commercialization and nutrition is sparse, mixed, and inconclusive in some studies. You find that agricultural commercialization is claimed to make smallholder farmers worse-off in terms of food security and nutritional outcomes, but the burden of these effects of commercialization are most felt by some vulnerable groups within the households, but also in the communities and specific examples of these are women and children.

So the available evidence is insufficient, but there are, for all the studies that are available... they also calling for more robust analysis that is based on sound research designed to be able to unpack any underlying associations.

They are also some other studies among the framework of literature on agricultural commercialization and nutrition that emphasize the fact that welfare and nutritional benefits of agriculture commercialization can only be leveraged through the gender lens. In other words, if you get women to work together with the men and they have the ownership and possibly also the decision making of these cash enterprises, then you likely will get benefits out of these enterprises. Next slide please.

And we also know from some other literature that increased human autonomy and empowerment is beneficial to household welfare, but it also has substantial contributions to the reduction of undernutrition for both women and children.

The reason, specifically for a student, is the fact that empowered women would put data quality and improvement feeding practices for children into consideration. But women are also being perceived women also perceive to be vital in safeguarding children's interests. Yet we know from so many other

studies, but also from the physical presence and observation, in communities in rural-based households that the decision making an ownership of resources, including cash crops in most of these societies is constrained. And so specifically for cash crops men are either the main asset owners and also the decision makers of how the cash or the revenues generated can be allocated to different members of the household. Next slide.

So our objective in this study is to try to bring all the aspects together, and rigorous is the assumption that when women are given the opportunity to own, and then make decisions in relation to cash crops, they will put children's interest at the front, and use the cash income raised to improve the children's nutrition status. We find these gaps really interesting, but we also I think contribute to the literature that is quite limited using a large panel dataset that covers most of Uganda for a long period of time, so we take advantage of that data. Second one is that we try to improve the analytical methods by accounting for quite a lot of heterogeneity both observed and unobserved at the household level, in individual child level, but also at the contextual level.

Another contribution in this sort of, like, remark of analysis is that we want to test the robustness of our results to see how stable they are, and examine if the effects of commercialization actually cutting across different children categories based on gender and age. Next slide.

So the data that we are using, as I say, it comes from six districts of northern Uganda... Yeah, so it comes from six districts of Uganda and the study, the way I thought, supported by the future Innovation Lab for Nutrition. As we can see the purple dots on the map showing essentially where the households are located, and we had about 3200 households at the baseline in 2012. We followed up the same houses in 2014, and the end line in 2016 and for the whole sample, we have about 12,000 children that are aged zero to 5 years. And we collected quite a range of data ranging from agriculture, nutrition and health, and enrollments, but also of course on gender roles and the sex of household heads and all that. And then we also collected child anthropometric data. Next slide.

So we are focusing here on subsample households that are growing cash crops, and that sample definitely then now comes down because we are focusing on households that have a child that is aged 6-59 months and whose anthropometric... the anthropometry of these children were taken. And then for those households that we are growing traditional cash crops and traditional cash crops in Uganda here mean coffee, cotton, sunflower, sugar cane, and sesame in the six months prior to each survey round. So the sample become small because we are focusing on mainly those traditional cash crops, and this diverts a bit from the previous presentation because here we really focus on mainly those crops that cannot, well, be consumed at the household level. Next slide.

So as part of the results the dependent variable for us would be the child nutritional status, which is HAZ scores, and from the graph that is presented on the right hand side of your slides, of your screen, is showing HAZ scores on the Y axis and child age. What is observed here is that in the trends of table growth it's essentially not any different from what we know from the literature. We see that child HAZ scores rapidly decline from birth until the age of about 20 months, which conforms with the fact that child faltering happens in the first 1000 days of life. So our results are not any different from what has been presented before in literature.

But what is also observed is that children from cash cropping households are slightly taller. So, in other words, they should be fairly healthier than from non-cash cropping households. Next slide please.

So our primary exposure variable is women's empowerment, and we measure women's empowerment. We know from literature that women's empowerment is multi-dimensional and context specific even within the same sort of, like, country you could find different environments and indices if you're using the same index. But we get into the main, sort of like, framework of measuring women's employment based on a woman's strategic decisions in life, and also evolve with respect to cash crops, the ability to negotiate increased decision making in their households, and the ability to fully utilize the available

resources, especially when this ability has been limited within the same household, but also relative to the community.

So the evidence between these various indicators of women's empowerment, and your child nutrition outcomes, is often called inconclusive and some studies that we have shown insignificant relationships. And we think that this is due to the limitations in study designs and analytical methods using only descriptive and analytical methods, but also failure to address and endogeneity concerns that potentially undermine the reliability of the actual relationships in play. Next slide.

So in our data collection we included questions that measure women's empowerment, as who actually owns the cash crop, and who makes the decisions on the cash crop, and who actually controls the crop itself, and who makes the decisions on whether to buy back and adjust inputs and serve those the output. So these three were the key questions that we asked for a lot of assets, but also enterprises and one of these enterprises with cash cropping enterprises.

In the analysis, we find that questions two and three—the actual control and the making of decisions and the release of revenues is essentially the same. And so we combine the list from the decision making and this definitely brings in a context specificity that we're talking about. So there are households where, I mentioned, they select the main man as the main decision maker or owner of the cash crop. They could also choose possibly also the main woman, and in some cases, then, you find households that are jointly making decisions or you're claiming to jointly own the resource. Next slide.

So in our analytical approach we give a lot of concentration on trying to account for selectivity bias or "confounding." Because if we did not account for it, then it would be difficult to draw the best conclusions on the relationship between men and women's empowerment regimes in terms of ownership and decision making for cash crops and the key nutrition outcomes. In this case HAZ scores. so we know, I mean, selection bias could stem from the fact that they are not without factors—those factors that could influence women's empowerment and child nutrition simultaneously. But we cannot possibly also be able to observe them well in the field.

The second source of these cofounders would be a potential reverse causality where you could assume that the households that how women who have well-nourished children may earn more respect from their husbands and communities, rendering such women more independent in cash crop ownership and decision making. So when we do not account for this active biases, then we likely will get not very good results have good estimates. Next slide.

So to account for that we use a combination of regression methods, the first one being the multinomial endogenous treatment regression, in which the first stage predict the factors that determine women's empowerment regimes. So, does the household to belong to a sole man, sole man ownership or decision making? Does it belong a sole woman or joint ownership, and if that is the case, what factors really determine that. And then we generate a selectivity correction that we put into the second stage of the estimation. And that's the case study, so essentially estimating the effect of women's empowerment and the child's HAZ scores. We combine this METE model with Correlated Random Effects (CRE) model to control for an observed time-invariant household heterogeneity that will likely be created with observed covariance, or those observed factors that we can see. And then we do this essentially by including the mean of the time-varying household level explanatory variables. Next slide.

So to be able to identify these METE models, it's a commanded to use instrumental variables and our instrumental variables are based within what is termed as the cognitive neighborhoods—so, those factors that essentially make a woman, A) the more important or less important, and that includes the first one as the household's marital status. The second one we look at the proportion of other houses in the community, specifically the parish, where women solely and/or jointly owned cash crops. So, and then the third one is the proportion of the households in the parish where women solely, or jointly

make decisions on the sale and the use of revenues. So there are three instrumental variables which are used to identify our models. Next slide.

So here we go out to the results, the first result is that we find that after accounting for all the observed and unobserved heterogeneity, we see that if we have a household that is led by a sole woman, then cash crops that are owned by sole women in households, then these households tend to increase HAZ scores by 0.59%. I don't show these results here, but that translates into 14% reduction in stunting, which we think is quite huge.

The second result that I have is that we have a negative selectivity bias and indeed, we have confoundedness that would affect the consistency of these estimates if it had not been considered. So what we see here is that they are unobserved characteristics of households or individuals that limit the woman from owning cash crops, which ultimately, then, has an effect on the child's HAZ scores and stunting. Next slide.

Our research theory is also showing that when sole women decision making is at the household level, then, for these cash crops, then child HAZ scores are increased by 0.64 points, and that is translated into the 20% reduction in stunting. So the decision making itself is much more important than ownership. So, if decision of ownership cannot be done, but then the woman is in charge, or can be able to make a decision, then this becomes gives an edge to the ownership in terms of reducing stunting. Here, we also see—which we didn't see in the ownership module—that joint decision making for a woman versus a sole man. So, in reference this a sole man increases his child's HAZ scores by 0.31%, which translates to about a 17% reduction in stunting. Again, we see that the variable for confoundedness here is also significant, but again, negative, which also confirms the selectivity bias that I talked about in the previous slide. Next slide please.

So the question would be here—now how are these effects felt across the different child sub samples? We see that the reason for that we have here is that women's empowerment, both in terms of ownership for Panel A but also decision making for panel B, is that women's empowerment is beneficial for all child groups. But another result—and those results are shown here is that the stunting effects were much more precisely estimated for sole woman ownership in all children going above two years. And for male children. And these results are not any different from what has been presented, not necessarily in empirical studies, but what has always been presented in others, but specifically in West Africa where your male children are favored by their mothers, and I think for the older children, it's much more to do with the biologics. Next slide.

So I won't come to conclusion here. And yeah, women in Uganda and other countries in similar contexts own less or no assets and play constrained roles in decision making of income generating activities, including, of course, cash crops. That variable literature shows that women's autonomy and empowerment can be been beneficial to household welfare with implications for improved child nutrition outcomes, but we also have other literature that shows mixed relationships between agricultural commercialization and child nutrition, and that nutritional benefits may be leveraged through a gendered lens. However, we don't have a lot of evidence to support this and also support policy decisions.

So in our study, we tried to contribute to this limited literature, and we empirically tried to analyze the relationships between women's empowerment in cash crops in Uganda and child growth outcomes. We used a relatively lean but relevant indicator for women's empowerment that is essentially looking at who owns and who makes decisions. Is it by the man alone? Is it by a woman alone? Is it both and how does that affect nutrition outcomes for children? Next slide.

So we employ the mixed multinomial methods with instrumentation and we take advantage of our panel dataset to address any form of confounding issues that we often associated with women's empowerment, and we find large and consistent association between women's empowerment regimes

and child HAZ scores. In particular, we find that women's empowerment in the cash crops reduces stunting by at least 14%, which is rarely achieved by many standalone interventions in developing countries.

So our results are much more convincing than previously appreciated, and because these potential confounders were accounted for. When we look at the identity of the households and the children based on age and sex, we find that women's empowerment actually benefits all children categories. Next slide.

So our study shows that intra-household dynamics and bargaining power in relation to agriculture-mediated cash plays an important role in child nutrition. The consequences of less empowered women in cash-cropping communities, we see, are clearly negative because then if you don't have a positive, then you definitely have a negative. But they can only be well-revealed when you know advanced analytical frameworks are employed as we are doing with this.

So for policy implications, but also for programmatic advice, I think our results underscore the importance of ensuring that agricultural development efforts—particularly the promotion of agricultural market access and web businesses—but not necessarily leaving out the issues to do with interventions in cash crops, and should not be blind to women's empowerment. If we want to improve household welfare, reduce poverty, we also must pay attention to childhood nutrition outcomes.

There is still work to be done, but from what we have done here—or what we have so far done—we still have not gone an extra mile to understand. But, more importantly, how men do things that are different from those that do not have that sort of empowerment, and how is the cash that is generated from, for instance, cash crops is used—and how is it to be used for better nutrition outcomes.

So I want to stop here, but I want to thank all the people that were involved in this research, particularly Patrick Webb and Shibani Ghosh, who are going to be involved, of course, in answering some of the questions because they know this paper. And, I want to thank all the participants of this webinar. I look forward to the discussion. Thank you.

Eileen Kennedy

Thank you for three terrific presentation. Lots of questions, some of which we have tried to answer online but a number of them we have not yet.

So let me start with—I'm trying to nest questions together.

The first set of questions, Nassul, if you don't mind, I'll direct to you because they revolve around this whole issue of commercialization of agriculture, which most people call cash cropping. I find it intriguing that these questions keep coming up, because as you as you know, Nassul when you and I were working at different points in time and, if free, Patrick Webb was also there. It was a very polarized view on cash cropping--cash probing good, cash dropping bad—and so the first question that's coming up, and I think it related to what you had in one of your slides where you talked about either mixed results of cash cropping or insufficient data or insufficient results. And what is problematic is many countries in real time, meaning in 2020, are having to make decisions on their agricultural strategies. And a lot of countries as part of a broader agricultural strategy are emphasizing cash crop production. And so I would ask you, from the point of view of evidence you have, not just Uganda, but evidence, you know of, what would you suggest to country policymakers as far as the emphasis on cash cropping as part of an agricultural strategy? What would you suggest, evidence-based, be the position of governments in emphasizing cash crop production? That's one—there'll be sub questions, but let's tackle that one first. That's a biggie.

Nassul Kabunga

So thank you so much. Eileen. And I think that's a very interesting question. And essentially, my advice is cash crops are good because they help countries and, for an exchange, they also help households help themselves out of poverty. But I think I mentioned—in one of my slides, especially in the conclusions—that if we promote cash crops, as a mere cash crop... I know very many parts of eastern Uganda where households produce a lot of sugar cane, for instance, but then they are suffering a lot from food insecurity. The mere fact is, when you get to those communities, is that the income that is generated on the revenues that are generated are owned by men, and men decide they do not really be give a lot of attention to the household welfare. They essentially go on buying bicycles, motorcycles, and possibly also cars. Then, of course, they really leave the issue of security and nutrition to the women who are left with a very small piece of land to deal with.

So my advice to government would be, yes. We need the cash crops. Yes, like we need any other enterprises, but then we need to give the gender aspect—and the women's empowerment aspect—a very crucial intervention.

Eileen Kennedy

Nassul, that's an interesting example you bring up because as you remember on the sugarcane issue, I worked for about 10 years on sugar cane production in South Western Kenya. And you're absolutely right that sugar cane tends to be a male dominated cash crop—decisions on that are dominated by males. Yet there, we saw some positive effects because even if it was a male crop, on average incomes of the household who were sugar cane producers increased. Some of that income translated to improve caloric intake at the household level, and some of that in turn resulted in increased caloric intake in preschoolers, and a lesser amount led to increases in child nutrition, as mentioned in anthropometry.

So, a related question—again, getting back to this—what do we suggest to governments? You can't control issues like a sole ownership of a crop. And so, again, from a broad-based perspective, you start to say, I think your first answer was cash cropping is good, on average. So how do you provide advice when the crops differ and control of the crops differ, sometimes solely women controlled, sometimes not. Would your across—I don't want to pressure too much on this—but would your across the board answer be, yes cash crop and commercialization should be part of an overall agricultural strategy for countries, but taking into account some context specific issues.

Nassul Kabunga

Eileen, you're absolutely right. That what we see in several countries is that agricultural policy itself is looking at production, it does not really look at the benefits of this production—who they accrue to if it is cash that is being generated from cash crops, for instance, but also even those food crops that have been turned into, you know, cash crops. Where does that income go? So you really need to look—you don't need to look at agriculture as a sole enterprise. It's all sort of like sector without looking at the other sectors. I would imagine that if you had the community development aspects included in giving land ownership and also enterprise ownership, but also decision making to women, and that would pull in several other ministries, for instance, ministry of gender and agricultural development, for instance. Then you'd have to make sort of like—you know, I would not really want to push for agricultural strategy as the agricultural ministry would want it, but I would want to see, that multi-sectoral sort of engagement, what happens from the production, but also from also from the disposition point of view.

So, I think it's a mixed thing and it might be a bit difficult discuss and have a concrete answer for each and everything. But my understanding is—and that's what we're trying to do here—that we need not necessarily say that we push for cash crops and forget these other several sectors that would be important for the welfare of households and communities.

Eileen Kennedy

Thank you. Alexandra, there was a question that I think specifically you could answer from what you presented, and the question was how much of the agricultural diversification that you talked about was related to men for commercial agriculture? And again, in your data, who made the decision on whether to produce these commercial crops—even though it was agricultural diversification that produced the crops—and who made the decisions to market? So let's start with agriculture diversification, how much of that was related to the decision on cash cropping, to sell the crop?

Alexandra Bellows

So from the data that we have, it appears that most of the crops being grown by households in this region were what our colleagues in Tanzania would consider a cash crop, and most of these seem to be sold in the market, because these were maize and nuts and seeds.

I would say that we don't know exactly. We don't have data on the crops being sold and how much of it was sold at the market. We just know what was grown and it appears that most of this would be typically considered a cash crop. Does that answer the question?

Eileen Kennedy

Thank you. Keith, I don't want you to think we're ignoring you. So let's get back to some of the data you presented where you're talking about—where the question came up, and there's several of them—but let me start with the first one. Income and household uses for purchases of foods to improve diet—how much of that related to the distance to markets?

Keith West

So we did not... Thank you for that question. We did not measure income very well. It's a tough measure to get at one time a year. And so we concentrated on expenditures on food in the previous month as our indicator. So I don't know. Is there a way to translate that into an expenditure question? Related question?

Eileen Kennedy

Well, why you know, Keith. I'll just interject my own bias. You know, in the work I've done. I mean, total expenditures is usually a good proxy for income. So let's put it that way.

Keith West

So what's the question again in relation to the purchases?

Eileen Kennedy

Yeah, the expenditures to improve diet. How much of that related to what I call market access or distance to market?

Keith West

Yeah, so we assessed 37 markets each survey year that were proximal to the sampled sites. And so distance was, in a way, controlled for because it was the closest markets that we had. But we have GIS data, we have not evaluated the distance of the homes to those markets. But all the markets that we assessed in these surveys were local and they are probably 40 to 50 foods that we evaluated prices for and are relating those two expenditure patterns reported by the households, but I don't have that data.

Eileen Kennedy

Okay, now, a lot of a lot of questions, not just for Keith, but I'll start with Keith because these are such complex issues. But a number of questions, Keith, revolving around were you able to look at what is being called social and cultural determinants to analyze effects on food security and nutrition? And let me give you an example—you don't have to respond directly on this—but when I traveled to the far western region of Nepal, one of one of the taboos related to when a woman had menses and they were

banished from the house out to, you know, what we would call shacks or whatever, which was not very positive. So were you able and analyzing effects on food security nutrition to look at taboos like menstruation, things related to pregnancy, birth? How did that over cloud—or how did that affect some of your results you're reporting.

Keith West

So, a lot of that, we didn't assess, but we do have data, for example, from the Terai, which is culturally very distinct from the hills and mountains, as we know. And the relationship between food production and availability and consumption is more complex. In the Terai, the entire household food consumption patterns are different and the roles and perceptions of women and gender equity issues are different in the in the Terai. We know that, and so there are taboos. We also know that how food is consumed in the household depends on who is consuming the food with you. That's especially related to young, young children.

And so those need to be untangled because they are going to affect the—they're going to mediate the relationship between what's grown and available in the household and what is consumed. I think one of the messages—women are, we know—mothers are often the last to consume meals and one of the messages I think here is, very simply, that if the food is available there is an increased tendency for women to eat more. What we haven't got is the gender gap because, historically, we don't ask about what men eat, but that needs to be done more and more in order to identify that gap, which can be related to taboos. And so that is missing in these data and is a need for the future.

Eileen Kennedy

Thank you. Now, this next question will be for all three of the panelists. [A webinar attendee] has a great question about what does COVID tell us about cash crops and the effects on foreign exchange and any of the issues where we're looking at related to food security and nutrition. I mean, that's such a new issue, COVID-19, but do we have any indication in any of the datasets in any of the three countries of the effects of COVID-19? Foreign exchange was brought up, but basically a larger issue on our current COVID-19 on food security and nutrition. Let's start with Alexandra.

Alexandra Bellows

Sure, so our data collection actually ended in August of 2019, so we don't have data after COVID, but it is a big issue that I know that the food security world has been talking about for the last six months. Of this reliance on cash crop and when trade potentially diminishes between countries and countries rely on that for income or growth—what happens? And a focus on maybe a more localized food system and the benefits or the negatives also with a localized food system as well... I'm sorry, we don't have a lot of data.

Eileen Kennedy

No, I mean this is a very recent phenomena. Nassul, any more recent data on that?

Nassul Kabunga

Yeah, thanks. So we don't have data on COVID in relation to what we've been doing, but I can only mention that in lieu of the fact that there is no tourism for a country like Uganda, I think the only source of foreign exchange—well, not the only one, but a major source foreign exchange for Uganda has been coffee. Essentially, coffee exports increased over the last, I don't know, six, five months? And I remember the politics and all the talk about it as one of the key things that concern us running down. So, yeah.

Eileen Kennedy

Thanks, and Keith?

Keith West

Yeah, I can't talk to the foreign exchange issue, but this is a new phenomenon. It's not going to go away, obviously, for a couple of years at least. We do know that as food insecurity becomes worse, diversity goes down, the quality of diet goes down whether it's Nepal or India or Bangladesh or anywhere. And as the stresses increase, we can expect these crops to become more palpable than before and probably lose some ground in the COVID pandemic.

So, I don't have an answer other than we are all aware of the problems of socialization and the problems of gathering in crowds and the problems that the poor have in complying with these basic procedures of social distancing and so forth. I think we all have antennas up right now. And it behooves every field activity and study to be looking at how this pandemic unfolds, not only with respect to the cases of disease, but the stresses that are occurring in communities as a result of the disruption. We have a lot to learn. And along the way, right now, very quickly.

Eileen Kennedy

The only thing I'll add there is a thank you for those answers and that the World Food Program, with the data they're presenting suggesting what's happening to decrease livelihoods for whole series of reasons, is undoubtedly going to lead to increased food insecurity and increase hunger globally. But those are those are global data. Interesting set of questions. And this is going to be for all three of the panelists related to empowerment of women, which is clearly critical when we look at control of income, food security, diets, nutrition.

I'll just put this out. And we will go in this order—Nassul, Alexandra, and Keith—there is the perception that women are more empowered in African households than they are, in this case, Nepali households. And so, let me ask are different measures of empowerment—I think, Nassul, you use women's decision making. But let's comment on the issue. Do you—you were asking for cross country comparison. Do you think women, whether it's in Uganda or Sub Saharan Africa, do you think women are more empowered in Uganda, or in Sub Saharan Africa, than in Asia, and what is the basis of your saying that?

Nassul Kabunga

I don't agree with that. Thanks again. I mean, for the question. That's a very interesting one and intriguing. I don't agree with that, but I want to bring forth the fact that when you look at all the literature talking about women's empowerment. To be honest, this is a context specific issue. You cannot design a program—you will, you can design programs that are cutting across—but in terms of whether in agriculture, where in non-agriculture enterprises, the different forms of empowerment really matter and they are specific given the context.

For instance, in Karamoja, we all have known for a very long time. I'm using the example of Uganda here, but Karamoja is one of those places where, you know, women's empowerment seems to be low. And as researchers, we designed methodologies, indices to measure woman's empowerment. But actually when you go to Karamoja you will be very surprised that woman there simply make all the decisions for the household. And they don't own land, but they have a big sale on livestock, which is like the major source of income and food. So my thinking is that we need to take each of these women's empowerment issues, take them in a specific context and then design programs to address them there. Maybe also, as well as interventions.

Eileen Kennedy

Thank you. Alexandra?

Alexandra Bellows

Hi, I've done actually very little work in Southeast Asia or South Asia and so I don't know if I can speak to the differences in women's empowerment between the two settings. But I do know from our work in

Tanzania that women's empowerment does vary as I think Nassul was saying, between households considerably as well. And that we have seen that women who appear to have more empowerment in their households have higher dietary diversity. But I think it might be very hard to compare, across countries, women's empowerment—and the effects that it might have on diet quality.

Eileen Kennedy

And Keith?

Keith West

I'm not the expert to be asking this question, too, but one cannot help but notice where education of women has been improved, that the status nutritional well-being of women increases as well, and I cite the huge education advances that have been made in Bangladesh where I've been working for a number of decades, where the program to improve women's education has led, just in the past few years, what we've noticed is more rural women have achieved a class 10 education than men in rural Bangladesh. And that's because of government programs to continue to educate women.

On the other hand, early marriage, disempowers women in rural South Asia. Getting married at 16 and 17 and having, having a child at 17 and 18, turns what we've seen is a healthy bounding young adolescent to a burdened young woman in her married life, and those social norms, you know, are being addressed in South Asia, and that will lead to greater decision making capabilities and these elements of empowerment that we all seek to address. So, compared to Africa, my experiences in Africa are limited to Malawi and Zambia and I don't think I could give you an authoritative answer on that contrast. But certainly, it's a driving agenda in South Asia undo these constraints on the ability of women to make decisions and to be more empowered.

Eileen Kennedy

Thanks, Keith. Now I'm going to have to do a rapid fire round because we will run out of time. And by that I mean questions specific to each presentation and let me start with Nassul. One question was, your percent improvement on stunting, you seem quite high. Are there other factors that didn't present in the data that you think are accounting for this above and beyond the agricultural perspective?

Nassul Kabunga

Yes, a very quick answer to that is that we're looking at the sub-sample of households that have cash crops and these are not the typical households you'll find in Uganda. But essentially what we want to see is when we compare those households with cash crops—and cash crops, then of course there's women's empowerment in these cash cropping households. Then what happens to stunting? So, like, levels and essentially we accounted for all households, individual child characteristics, and contextual characteristics and these are the results that we get. And they seem to be stable when we employ different analytical methods.

Eileen Kennedy

Yeah, interesting, thank you. Keith, two specific questions. What was the plot size for agriculture in your households and do you have any data on nutrition education?

Keith West

So, plot size. I know someone wrote in a question on that. I don't have that committed to memory right now, what the plot size is—under a half a hectare is very, very common and amongst poor rural families. Under half a hectare to one hectare—there's an obvious skew with wealth, but the plot sizes are not typically large and they get divided with each generation. And the second one?

Eileen Kennedy

Nutrition Education.

Keith West

We did not do nutrition education in this assessment. So I can't, I can't respond to that question other than it was a survey and there was no nutrition education offer.

Eileen Kennedy

Okay, thanks, Keith. A very specific question, Alexandra. Did you do you have any data on wild foods?

Alexandra Bellows

So this also kind of relates to the question that someone asked about ultra-processed foods as well. And we use a food frequency questionnaire, where we only looked at the specific foods we asked about. While we had over 100 foods that are commonly consumed by women in this community, I do not think we included any wild foods or even ultra-processed foods, and that is something that, unfortunately, you don't capture when you're using an FFQ because you're limited to the foods that you thought about a priori.

Eileen Kennedy

Yeah, yeah. Good. All right. All we have just enough time for about 30 seconds for each of the panelists to provide if they want any, any final comments and I'll go in the order of presentation. Keith, 30 seconds on top line issues for you.

Keith West

Top line issues is related to the multi- you know multifactorial approach that many who are sitting around this virtual table right now are pursuing, whether it's through dietary counseling nutrition education, education of women, examining what is possible to produce in the home, how to reduce food wastage that is going on in our broad community that can translate into increased amounts of food locally, just by reducing waste. There are many different facets that can be pursued to increase the food availability year round, and from year to year—I think we have a long way to go. The diet the data that we show and that others have shown and various reports from Nepal are that the diet continues to be low in diversity and low in nutritional content for women, not adequate, leading to micronutrient deficiencies, with very, very real health consequences, and I would just encourage us all to keep plowing along in this direction.

Eileen Kennedy

Great. Alexandra?

Alexandra Bellows

I am again really thankful for this opportunity to share my research and just very thankful for the opportunity to participate in this research. This study really sparked my interest in the linkages between agriculture and nutrition, but also the in-between as well—the entire food system and the food environment and how that might link to diet quality. And, I'm really excited to continue working on these issues. Thank you.

Eileen Kennedy

Thank you, and Nassul.

Nassul Kabunga

Yeah, thank you. Eileen, and thanks everyone. Thanks, most especially to our participants of this webinar. I'm really glad that we could share the results and thanks for giving me this opportunity. I would want to emphasize the fact that we are still working on cash crops, but we're also working on livestock, so much importance in livestock. We have some results that we perhaps will talk about some other time. But essentially, they're all focusing, you know, looking at you know, pointing in the same

direction. So I'm sure that when we have the data that we have, and the kinds of data that we have, then we can be able to analyze several other things and then we can give sort of a broad spectrum recommendation. So thanks once again for the opportunity. And I'm glad that we can have this kind of platform and discuss, even within the midst of COVID, and I look for another opportunity to exchange through email or through whatever other form. Thanks again.

Eileen Kennedy

My parting comment, as I thought of these presentations—terrific presentations and data. I have a paper coming out with colleagues from FAL and part of it is the question, “Does gender talk bring us anywhere?” You have to read the paper to get to the answer, but as much as we know it uncovers more questions that we have, but we're making progress, and obviously the gender dimension of agriculture, diet quality, and nutrition is critical. And I would say, “Hold on to be continued...” as we explore this issue further in forthcoming webinars as part of the series. Thank you to the presenters. Thank you to all the participants and enjoy the rest of your day. Bye bye.



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