

BARRIERS AND ENABLERS OF AGRICULTURE AND NUTRITION BEHAVIORS IN CHIN STATE, MYANMAR

Formative Research for Productive Agriculture through Community Engagement (PACE)

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To increase the effectiveness of the PACE Project approach which employs Production (farmer) Demonstration groups and adapted Care Group model, the CRS and KMSS team conducted formative research using the barrier analysis methodology in two target townships in Chin State to study the barriers and enablers of two agriculture and two nutrition behaviors. The results of the barrier analyses will be used to inform and strengthen the behavior change strategy of the Production Demonstration Groups and adapted Care Groups. Specifically, the findings will inform the development and adaptation of the agriculture demonstration and Essential Nutrition and Hygiene Action lessons and job-aids to ensure messages that are context specific, culturally appropriate, and effective in eliciting behavior change through addressing localized barriers and enablers.



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List of Abbreviations

BA	Barrier Analysis
CORAD	Chokhlei Organization For Rural and Agricultural Development
CRS	Catholic Relief Services
DBC	Designing for Behavior Change
FA	Field Agent
FH	Food for the Hungry
HKI	Helen Keller International
IEC	Information Education Communication
KMG	Karuna Mother Group
KMSS	Karuna Mission Social Solidarity
LIFT	Livelihood Food Security Trust Fund
MOHS	Ministry of Health and Sports
NW	Neighbor Women
PACE	Productive Agriculture through Community Engagement
PLW	Pregnant Lactating Women
PRA	Participatory Rapid Assessment
SUN	Scaling Up Nutrition
TOPS	Technical and Operational Performance Support program
WHO	World Health Organization

Executive Summary

Background. Catholic Relief Services/Myanmar, in partnership with Karuna Mission Social Solidarity (KMSS), is implementing a three-year (2016-2019) Livelihood Food Security Trust Fund (LIFT) funded project called Productive Agriculture through Community Engagement (PACE). PACE will reach 1477 pregnant and lactating women and 1500 farmers living in 60 villages in Falam, Thantlang, and Rezua townships. Chin State has the highest prevalence of stunting among children under five, respectively 41% (MoHS 2015). Moreover, 73% of the Chin population are estimated to be living below the poverty line—the highest incidence of poverty among all states and regions, much higher than the national average of 26 % (MoHS 2010).

Methodology. The Barrier Analysis (BA) was selected as the formative research tool to inform and fill gaps within the behavior change strategy. The BA was the preferred formative research method for two key reasons: the BA is a rapid form of formative research and the BA can be conducted by national field staff. The BAs aimed to study the following nutrition and agriculture behaviors relevant to messages/practices to be promoted by PACE.

Behaviors Studied and Number of Respondents

Behaviors	Priority Group	Doer	Non-doer	Total
Nutrition				
1. Lactating mothers eat two extra bowls of food each day	Lactating mothers	45	45	90
2. Mothers of children 6-23 months feed her baby two different colorful fruit and vegetables at each meal	Mothers of children 6-23 mos	45	45	90
Agriculture				
3. Maize famers store maize seeds in hermetic containers.	Maize farmers	47	45	92
4. Farmers plant a leguminous crop in the same field as their staple crop during the same season	Maize and legume farmers	45	45	90

Analysis. The data was analyzed using a standard BA tabulation Excel sheet as well as manual tabulation in the field. The significant findings were identified by a 15-percentage point difference in responses between doers and non-doers. To ensure data quality, the digital BA tabulation conducted a more complex statistical analysis determining if the doer/non-doer difference was statistically significant by calculating the risk ratio.

Results. The key results of the BA on lactating women eating two extra bowls of food each day uncovered five significant determinants: self-efficacy, cue for action, access, and social norms. The project will aim to: increase skills to prepare meals mothers would enjoy using nutritious locally available ingredients; reduce the perception that meat is only good or tasty food/meal; increase ability to remember to eat two extra bowls each day while breastfeeding; Increase access of staple and nutritious crops year-round; and increase perception among husbands providing for the family includes supporting lactating wife to eat two extra bowls.

In order to develop a contextualized social behavior change strategy in promoting diet diversity among children under two, the barrier analysis survey aimed to identify barriers and enablers of mothers in feeding her child aged 6-23 months two different types of colorful fruit and/or vegetable each day. The significant determinants include: self-efficacy, positive consequences, susceptibility, severity, and action efficacy. Increase ability to grow nutritious vegetables. The project will aim to: increase perception that people can grow nutritious vegetable in home gardens with little money; increase ability to access at least two nutritious vegetable and fruit year-round; increase the skill to prepare balanced diet with locally available foods; increase perception that feeding baby

Summary of Nutrition BA Finding

Barriers	Enablers
Lactating mothers eating two extra bowls each day	
<ul style="list-style-type: none"> • Self-efficacy: able to eat when there is tasty food (meat/eggs) • Limited Access 	<ul style="list-style-type: none"> • Self-Efficacy: Breastfeeding increases hunger • Social Norm: Husband approves
Mothers of children 6-23 months feed two different types of colorful fruit and vegetable each meal	
<ul style="list-style-type: none"> • Self-efficacy: unable to grow vegetables; no money • Access: Vegetables are not available year-round • Low perceived susceptibility • Low perceived severity • Low action-efficacy 	<ul style="list-style-type: none"> • Self-efficacy: knowing the benefit • Positive consequence: Healthy baby grows strong

two or more colorful fruit and veg helps baby to grow healthy and strong increase perception that malnutrition is likely for baby not eating 2+ fruit/veg each day; increase perception that malnutrition for children under two years old is severe/serious and increase perception when you feed your child 6-23 months at least two types of colorful fruits and vegetable each day it protects against malnutrition.

Key results of the BA for hermetic storage include self-efficacy, access, cues for action, susceptibility, and action efficacy. In order to encourage behavior change and enhance intervention effectiveness, PACE will aim to increase access by improving farmer skills to make hermetic containers; increase the perception that a lot of farmer’s seeds will not be damaged if they store them in air- tight, water proof containers; and increase the perception that it is not difficult at all to remember to store seeds in hermetically sealed containers one month after harvesting. As show in the summary finding table, the key results for the intercropping behavior include self-efficacy, negative consequences, and positive consequences. Two key barriers were identified that PACE will anticipate when promoting the behavior. The PACE project will aim to: 1) increase the perception that there are less weeds when farmers intercrop maize and pulses, 2) increase the perception that intercropping maize and beans saves time and labor when farmers’ compare the total yield, 3) reduce the occurrence of rat/bird damage to intercropped maize and pulses and, reduce the occurrence of pest damage to intercropped maize and pulses.

Summary Agriculture BA Findings

Barriers	Enablers
Maize famers store maize seeds in hermetic containers	
Self-efficacy: <ul style="list-style-type: none"> Misconception and lack of understanding about what is ‘hermetic storage’ 	Self-Efficacy: <ul style="list-style-type: none"> know the benefits of hermetic storage know how to select seeds
Negative Consequence <ul style="list-style-type: none"> Misconception of hermetic storage that ‘seed gets rotten and doesn’t germinate’ 	Positive Consequence <ul style="list-style-type: none"> Hermetic storage seed has ‘no pests and disease’
Farmers plant a leguminous crop in the same field as their staple maize crop during the same season	
Self-efficacy: <ul style="list-style-type: none"> Weeding makes it difficult to intercrop maize and pulse 	Positive Consequence <ul style="list-style-type: none"> Intercropping saves time and labor.
Negative Consequence <ul style="list-style-type: none"> Rats or birds climb up and eat maize 	Action efficacy

Key Activities. For nutrition behaviors, PACE will implement home visits, cooking demonstrations, and kitchen gardens. Home visits with volunteers aim to improve perception through promotion of the ENAs and peer-to-peer support in developing mutual understanding about the issues, identifying and collectively overcoming challenges, and trying new behaviors for short periods of time. The cooking demonstrations are led by volunteers with support by the project staff with PLWs to develop skills to prepare meals for baby including, but not limited to, at least two colorful fruit and vegetables that are locally available. Demonstrations provide an opportunity for practical skill building and coaching as the groups of neighborhood women share challenges and mutually consider ways to assuage barriers.

PACE will promote the entire process of seed selection practice including selection and marking of healthy plant in the field, healthy cob selection, drying to appropriate moisture, dehulling the central part of the cob, and placing the kernels in airtight water proof containers. PACE will conduct community demonstration sessions on intercropping maize with pulses. The community demonstration will aim to improve farmers’ perception of growing maize with pulses which include saved labor, increased total yield and better nutrition and diet diversity for their families. PACE will also provide messages about pest management (e.g., rats and birds). Moreover, PACE will develop IEC materials closely considering and applying the findings from this barrier analysis and significant determinants.

Discussion. Though BA results reveal several significant barriers and enablers, there are a few responses where further inquiry is needed to add depth and understanding of perceptions among the priority group. The non-significant findings require further exploration to contribute to a sound SBCC approach in promoting extra two bowls while breastfeeding. BA results find that among the priority group, limited water during dry season is not identified as a barrier even though the survey was conducted during the dry season. Further investigation is needed to confirm PRA results, which identified water as a barrier for home gardens. Subsequently, money was reported by both doers and non-doers as a challenge, though not significant. As Chin is one of the most impoverished states in Myanmar, it is expected that money is a major challenge. With impending cash transfer programs in Chin, better understanding of these perceptions is needed to inform and ensure responsive programmatic decisions. Mothers also mentioned vitamins as a positive consequence, which indicates that there may be an emic definition of nutrition in Chin that PACE should understand and apply in SBCC promotion.

There is also a need to understand more about what motivates or enables doers to intercrop maize and pulses. Many of the significant determinants represent barriers which have been overcome by doers that is they are doing the behavior despite the barriers, so more investigation of what motivates or encourages doers to do the behavior, despite the barriers they identified, is needed.



Introduction

BACKGROUND

Catholic Relief Services (CRS)/Myanmar is implementing a three-year (2016-2019) LIFT-funded project called Productive Agriculture through Community Engagement (PACE). PACE will reach 1477 pregnant and lactating women and 1500 farmers living in 60 villages in Falam, Thantlang, and Rezia townships. Chin State has the highest prevalence of stunting among children under 5, respectively 41% (MoHS 2015). Moreover, 73% of the Chin population are estimated to be living below the poverty line in Chin State—the highest incidence of poverty among all states and regions, much higher than the national average of 26%(MoHS 2010). The core hunger period ranges from April through August, with over 40% of families experiencing at least some months without sufficient food (CRS and KMSS 2014). Reduced crop yields resulting from poor soil fertility, poor seed quality, and limited use of new practices and inputs undermines food security throughout much of the state.

PACE seeks to contribute to efforts in improving nutritional outcomes, specifically stunting rates of children under five. Within PACE target villages, PACE aims to increase sustainable farm production and improve dietary diversity among smallholder farmers and PLWs and children under 23 months. In order to achieve these objectives, PACE promotes the adoption of nutritious feeding and eating practices among PLWs and children between 6-23 months. In support of these nutrition behaviors, PACE addresses issues of harvest loss and access to nutritious food all year round. In both components, behavior change is fundamental, thus SBCC approaches underpin the mechanisms for promoting behavior change. For the nutrition component, PACE employs an adapted Care Group approach as the platform to promote the Essential Nutrition and Hygiene Actions. Among farmers, PACE employs parallel SBCC principles in production demonstration groups (PDG). Targeting both male and female beneficiaries, the key objective is harmonized behavior change promotion to resonate within the household among both male and female family members.

MALNUTRITION AND FOOD SECURITY IN CHIN



Malnutrition is highly prevalent in Myanmar. With one of the highest rates of stunting in the region: 29% of children under the age of five are stunted, peaking at 41% in Chin State (MoHS 2015). Additionally, 7% are wasted, 19% are underweight, and 1% are overweight (MoHS 2015). WHO recommendations are to reduce the number of children under 5 who are stunted by 40% and to reduce and maintain wasting to less than 5% (WHO 2014). According to the Lancet 2013 Maternal and Child Nutrition Series, suboptimal maternal, infant and young child nutrition practices contribute significantly to stunting and wasting (Lancet 2013). With the recent launch of a national campaign to tackle malnutrition by State Counsellor Aung San Suu Kyi in January 2017, there is high-level commitment by the Republic of the Union of Myanmar to improving nutrition by including

nutrition in national development planning (SUN 2017). Scaling up interventions to address poor maternal, infant and young child nutrition practices is critical to achieving the goal of reducing stunting by 40% by 2025 (SUN 2017).

Many children suffer from important micronutrient deficiencies, and lack key vitamins such as A, B, iron and iodine (MoHS 2011). Even though supplementation programs have been in effect for 10 plus years, the coverage in rural and remote areas is scant. For example, in Chin only 40% of pregnant mothers receive iron supplements and even less women receive B1 and Vitamin A supplements, 29.3% and 34.5 respectively (MoHS 2012). Often irreversible, the impact of poor nutrition can make children more vulnerable to infection, compromise physical growth, impair cognitive development, and reduce lifetime earnings.

In Chin, the food insecurity situation contributes to the appalling nutritional condition. A food security report by Solidarities International found in a township in Chin more than 60% of the surveyed households have a poor Food Consumption Score, against only 7 to 8% having an acceptable one (Solidarities 2011). Poor soil fertility, a result of shorter fallow periods and limited use of inputs such as fertilizer, contributes to dramatic yield reduction. Moreover, seeds and grain are stored in open air rather than in hermetically sealed containers such that, a majority of maize seed and grain are damaged by pest and disease. The result is losses in food grain and poor quality seed resulting in further low yield in successive planting seasons. Vegetables currently grown are generally of limited nutrition value, with many gardens used for production of vegetable such as garlic, onions and cabbage. The vegetable production is also mostly restricted to the summer due to lack of water.

Dietary diversity is poor among children under 2 years and pregnant and lactating women. The PACE baseline found that children 6-23 months consume an average of 2.3 of 7 food groups and only 20% meet the minimum diet diversity (CRS 2017). PRAs have also uncovered that diet restrictions and taboos compel many lactating women to limit consumption of micro-nutrient rich foods at a time when they are most needed (LEARN 2016). These practices may contribute to low birth weights for 9% of newborns in the country (MoH 2011). During periods of food insecurity, women further reduce the quantity and quality of food they eat as a coping mechanism (LIFT 2012).

Methodology

BARRIER ANALYSIS AND DESIGNING FOR BEHAVIOR CHANGE FRAMEWORK

The Barrier Analysis was selected as the formative research tool to inform and fill gaps within the behavior change strategy. The BA was the preferred formative research method for two key reasons, the BA is a rapid form of formative research and the BA can be conducted by national field staff. The rapid nature of the BA allowed for staff to learn and augment the program as needed prior to the finalization of PACE learning materials and training. Secondly, the methodology is designed for field staff, which critical for Chin as field staff have limited capacity in research. Therefore, using the Designing for Behavior Change (DBC) Framework, PACE had identified and detailed the behaviors and priority group and influencing group. The DBC framework is a behavior change planning tool that helps identify and articulate crucial components of behavior change design. The key components include: Behavior Statement; description of the Priority Group; and selection of Determinants, Bridges to Activities, and Activities. Thus, PACE undertook the BA to study behaviors identified from the baseline among target population and programmatically timely in promotion in the coming year.

In order to review and augment the behavior change strategy for promoting ENA practices, the DBC framework tool helped to answer these following questions:

- What is the specific, feasible and effective Behavior to promote?
- Who are the Priority Groups and Influencing Groups?
- What are the most important Determinants affecting this Behavior with this group?
- Which Bridges to Activities need to be promoted?
- Which Activities will be implemented to address the Bridge to Activities?

OBJECTIVE

To strengthening the impact of the project activities in promoting and achieving behavior change, the Barrier Analysis was conducted for the following objectives:

- To identify the enablers and barriers to adoption of key agriculture and nutrition behaviors promoted by the PACE project
- To identify the influencing groups in the community who encourage/discourage adoption of these behaviors

BEHAVIORS STUDIED

Baseline findings identified behaviors that required further exploration to understand key barriers and enablers for adoption. These included the following:

Nutrition

1. Consumption of protein-rich foods (pulses and/or animal source foods) amongst women and children aged 6-23 months
2. Pregnant and lactating women consumed extra meals every day
3. Handwashing with soap/ash at five critical times
4. Cooking different enriched porridges every day

Agriculture

1. Hermetic storage of maize and pulse grain
2. Selecting healthy plants from the center of the field to be used for seed production
3. Fertilizer use (including natural fertilizers such as ash) by farmers in year 2 of the shifting cultivation cycle and those that are not engaged in shifting cultivation
4. Thinning maize plants when they are 2.5 inches high
5. Pulse cultivation (diversification of pulse crop)

Although all behaviors were found to be in low practice, two behaviors for each sector were prioritized based on implementation plans while the remaining behaviors are scheduled to be studied at a later date. The BAs aimed to study for agriculture: storage of maize seeds in hermetic container and planting a leguminous crop with maize in the same field; and for nutrition: maternal nutrition and IYCF practices as promoted by the ENA, PLWs consuming 1-2 extra meals every day and feeding children 2-3 different colorful foods. In the baseline, hermetic grain storage was very low in practice and during the development of BA study, the team decided to study seed storage rather than grain storage practice because grain storage is too low to find enough doers. Seed storage practice is still sufficiently low but also had enough doers to properly analyze the impact of barriers on doers and non-doers.

BEHAVIORS STUDIED

1. Mothers of children 6-23 months feed children two different colorful fruit/vegetable at each meal
 2. Lactating women eat two extra bowls of food each day
 3. Maize farmers store maize seeds in hermetic (air-tight, water-proof) containers.
 4. Farmers plant a leguminous crop in the same field as their staple maize crop during the same season
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BARRIER ANALYSIS QUESTIONNAIRES

Questionnaires were developed as a product of a DBC Framework and Barrier Analysis Training hosted by HKI/Vietnam and supported by Food for the Hungry/TOPS. Questionnaires were developed by the CRS Livelihood Program Manager and Health Program Manager. An important step in the development was selecting the determinant that influence behavior that would be included in the questionnaires, as some are not relevant to the project. Determinants represent a person's feelings, beliefs or other elements within his or her environment that can support him or her to do a behavior or prevent him or her from doing a behavior. Although there are 12 determinants in total, the following are more commonly found to be the most powerful for health and nutrition behaviors:

1. **Perceived self-efficacy/skills:** An individual's belief that he or she can do a particular behavior given his or her current knowledge and skills. The set of knowledge, skills, abilities and confidence necessary to perform a particular Behavior
2. **Perceived social norms:** The perception that people important to an individual think that he or she should do the Behavior. There are two parts: who matters most to the person on a particular issue, and what he or she perceives those people think he or she should do
3. **Perceived positive consequences:** What positive things a person thinks will happen as a result of performing a Behavior
4. **Perceived negative consequences:** What negative things a person thinks will happen as a result of performing a Behavior

In developing the questionnaires, the team decided to include relevant determinants among the 12 determinants and excluded such determinants as policy because influencing policy is beyond the scope of the project. See Annex A for complete list of determinants.

The locations of the BA data collection required translation in three languages, Burmese, Lautu and Zotung, because local dialects are frequently used in villages with limited literacy in Burmese. It is estimated that there are 50 plus dialects within Chin. All three translations were completed by the KMSS Nutrition Officer and KMSS Agriculture Officer with support from the CRS Program Managers. During the training, the field staff reviewed the translation for full comprehensive and edits aloud with team members that spoke the same language. Each team aloud read the questions and translations for coherency, which was challenging because some staff had limited capacity in the written local dialects. Staff were more comfortable reading the English and Burmese and then translating into the local dialects verbally to check the quality and consistency of the translations. This required a half day where same-language teams reviewed the tools and practiced the interviews. The tools also had three languages listed for ease of comprehension, English, Burmese, and one local dialect. See Annex 4 for questionnaires.



SAMPLING

According to the BA guidelines, 45 doers and 45 non-doers are required at minimum for each behavior studied. Since there were 4 behaviors of interest, the program team was tasked with finding a total of approximately 360 respondents. Given the number of staff to support the BA, the staff were divided into Lautu and Zotung language teams. Villages were selected based on program coverage, language, and distance from Rezia Town. A total of 10 villages were identified for data collection and during data collection 12 villages were visited for data collection. Important note as well, considering the capacity and confidence of the team, the BA questionnaires were also divided among the two teams. One team responsible for one nutrition and one agriculture BAs and the second team responsible for the remaining nutrition and agriculture BAs. Neither team conducted all four BAs. See Annex 3 for the complete list of villages. Once in the villages, respondents were identified through purposeful sampling, teams met with the village leader to share the objective of the BA and ask for help in identifying potential homes with individuals meeting the priority group definition. From there, the staff went door to door completing the screening questions to classify if individuals were eligible to be interviewed.

BARRIER ANALYSIS TRAINING

The training of the BA took place over three days with 10 data collectors from the project team, inclusive of field agents, nutrition and agriculture officers, and project coordinator, along with staff from CORAD, a LIFT implementing partner. The CRS Livelihood PM and Health PM facilitated the training building from the Training of Trainers with HKI and FH/TOPS. See Annex 2 for list of participants. The training consisted of the following key components of the DBC/BA training:

Table 1. Barrier Analysis Training Topics

Item	Lesson Name	Duration
1	Introductions	1 hour
2	PACE Overview: SO2	1 hour
3	Overview of the Designing for Behavior Change Framework	1.5 hour
4	Identifying Determinants that Influence Behavior	2 hours
5	Barrier Analysis and Doer/Non-Doer Surveys	1.5 hours
6	Introduction to the Questionnaire	1.5 hours
7	Learning to Interview the Doer/Non-Doer Way	1.5 hours
8	Conducting the Survey	2 hours
9	Organizing the Field Work	2 hours
10	Closing Session	1 hour

FIELD WORK/DATA COLLECTION

Field work and data collection was completed over four days in 12 villages in Rezua and Thantlang Townships in February-March 2017. Rezua town was the central point of training and analysis. Staff were divided into two teams based on language, one team conducted surveys in Lautu language in Thantlang villages and the other conducted surveys in Zotung language in Rezua villages. Each team was led by a supervisor who managed the field work and communicated challenges with the facilitator to identify solutions and maintain consistency between the two teams. The supervisors recorded the number of interviewed conducted to ensure teams met the 45-45 doer/non-doer requirement as well as supporting the staff with challenging in data collection i.e. finding respondents, asking questions, probing. Additionally, the teams conducted one agriculture BA and one nutrition BA each for ease of translation and mutual understanding of the questionnaires.

Table 2. Behaviors Studied and Number of Respondents

Behaviors	Doer	Non-doer	Total
Nutrition			
5. Lactating mothers eat two extra bowls of food each day	45	45	90
6. Mothers of children 6-23 months feed her baby two different colorful fruit and vegetables per day	45	45	90
Agriculture			
7. Maize famers store maize seeds in hermetic (air-tight, water-proof) containers	47	45	92
8. Farmers plant a leguminous crop in the same field as their staple crop during the same season	45	45	90

CODING, TABULATION, AND ANALYSIS

Facilitated by CRS Program Managers, manual coding, tabulation, and analysis was conducted immediately after data collection over three days in Rezia Town to ensure the timely recollection of interviews by the PACE data collectors. In addition to the manual data analysis, results were entered into a Barrier Analysis Tabulation Sheet, a Microsoft Excel table specially created for finding differences between Doers and Non-Doers. The spreadsheet calculates the percentages of Doers and Non-Doers that gave each response and identifies differences that are statistically significant. Using the spreadsheet, program staff were more likely to find more statistically significant differences between Doers and Non-Doers (as compared with just looking for 15-point differences between Doers and Non-Doers). It also shows the magnitude of each Determinant (e.g., “Doers were seven times more likely than Non-Doers to say that their husbands approved of the Behavior”). The data was then reviewed by CRS technical advisors for cogency in interpretation. Then, the results of finalized by the CRS program managers.

Limitations and Challenges

As this barrier analysis was the first experience for CRS Myanmar and KMSS, there were limitations and challenges to consider and the implications on findings. Limitations include the following: translation, relaxing the behavior, finding respondents, and quality of interviews.

Translation

As the BA is a qualitative tool crucially dependent on asking, phrasing, and probing of questions in various tenses, language was a major challenge in conducting the questionnaires. Language difficulties may have diminished the data quality as linguistic diversity and level of comprehension of each language written and oral varied from staff to staff. Questionnaires were translated into five languages, Burmese, Hakha, Falam, Lautu, and Zotung, to cover the three townships the project supports. However, in the field, the BAs were conducted across two townships requiring only two languages, Lautu and Zotung. Particularly, during the questionnaire development phase, the translation of the conditional tense was difficult in all three languages. Similarly, ensuring the same meaning across the four languages proved challenging. The English questionnaires were translated first to Burmese, but field staff preferred to translate from English to local dialect. Also, the field staff shared the literacy difficulties in the local dialects. Although there are written forms of the dialects, literacy in the local dialects is quite low. Therefore, some preferred to read written Burmese and translate into local dialect verbally. In order to ensure consistency of the questions, the team did their best to translate questions into Lautu and Zotung using English and Burmese combined. To ensure mutual understanding, meaning, and phrasing of the questions, the team read and practiced aloud reach question to agree on similar translation and meaning. Further BAs will need to allocate sufficient time and review to come to consensus on the translations across the multiple language used within PACE.

- *Recommendation: In future BAs, a full day is recommended dedicated to review, practice, and coach through the questionnaires not only for translations, but to strengthen interviewing skills and ensure data quality among all interviewers and languages.*

Relaxing the behavior

The original BAs were developed with evidence-based ideal behaviors for nutrition, using the ENAs as the key reference. Therefore, the nutrition behaviors were as follows based on specific ENA messages: lactating mothers eat two extra bowls each day and mothers of children 6-11 months feed three different colorful foods at each meal. During the training, the staff raised serious concerns about the feasibility of finding enough doers using these behavior statements. The three colorful foods included animal source protein, legumes, and vegetables/fruit. However, animal-source protein is very rare in Chin, especially during the dry season and among the very poor. Thus, the behavior was relaxed to mothers of children 6-23 months feed two different types of colorful types of vegetable and fruit at each meal. Staff asked to relax the behavior statement further to each day, but after lengthy discussion the team decided against it as it increased the risk of diluting the group of doers. For future BAs, the team needs additional support and advice from technical experts on fine tuning the balance between the ideal behavior statement, relaxed behavior statement, screening questions, and finding adequate number of doers.

- *Recommendation: Thorough discussion and decision on the ideal and relaxed behavior statements should be in full agreement with the staff conducting the BA and working in the area as the adjustments during the training and in the field may deteriorate the data quality and consistency.*

Finding Respondents

All four BAs had severe difficulties finding adequate doers and non-doers. The team had anticipated this hurdle due to the low population density, far distances between villages, and the dry season resulting in limited vegetation. The nutrition BAs, firstly, faced challenges in locating children 6-23 months even to conduct the screening questions. Also, lactating mothers practicing the behavior were rare. However, in the field locating individuals to interview that fit the criteria for doer and non-doer remained onerous. The teams needed to locate mothers that were lactating and mothers with children 6-11 months. Teams were not able to find mothers with children within that age range. Therefore, the teams broadened the desired population to mothers with children 6-23 months. Although, these challenges were anticipated the decision based on language capacity exacerbated the populations in which the team had access. The teams were divided into Lautu speaking and Zotung speaking. Original plans entailed that both Lautu and Zotung teams conduct all four BAs. However due to challenges in comprehending the surveys, the facilitators decided to reduce the BAs that each team was responsible for to two BAs per team. Each team conducted one agriculture BA and one nutrition BA with questionnaires corresponding to language needs. Unfortunately, the number of individuals available to screen was greatly reduced by this language division. Zotung area had small villages with less than 100 HH, whereas the Lautu area had villages with 300 plus HHs. This limited the coverage area in which the teams could screen for doers and non-doers.

- *Recommendation: To ensure adequate number of potential respondents to screen and interview, interviewers should conduct the questionnaires for all behaviors studied to increase the likelihood of finding eligible respondents.*

Quality of Interviews

Staff were experienced in collecting data, although their experience was mainly focused around closed-ended surveys. During the analysis, facilitators found codes and responses to be limited with staff unable to recall richer responses. Staff also shared challenges in probing adequately for rich responses within the recommended 20-30 minute interview period and lack of engagement by respondent. Staff required more probing practice and therefore during the BA, struggled to draw out responses especially regarding disadvantages and negative consequences. Staff reported that respondents were simply timid and reticent to respond. The impact on the results may be significant in that the BAs

did not capture the full range of perceptions with needed richness. Training, practice, and coaching on qualitative interviewing skills is a principal focus for future BAs.

The coding and tabulation of the questionnaires revealed a major gap in the interviews. Staff were unable to effectively draw out rich responses for some of the questions. They reported that probes were not as effective when interviewees were reticent, providing only one answer without further thought or consideration for other responses. Also, when responses related to a question later in the survey, staff found it challenging to connect the responses to the corresponding question. More training is needed on probing for rich responses and develop different techniques through practice and coaching.

Questionnaires for Agriculture Behaviors

The agriculture behavior questionnaire studying intercropping, specifically “farmers plant a leguminous crop in the same field as their staple crop during the same season,” inquired about susceptibility incorrectly. The question was posed as “how likely is it that a lot of maize and pulses you intercrop will be damaged by pests?” However, that question was not effective in inquiring about the susceptibility of the key issue or problem that farmers could face if they did not practice the behavior. The issue here is that the “susceptibility” question is intended to identify respondents’ perceived risk that they will face the problem that the behavior is trying to address, independent of the behavior itself. The way that the question was asked in this BA is an action efficacy question, as it is getting at how effective intercropping would be at preventing the problem of pest damage (i.e. asking about the problem (pest damage) if the behavior (intercropping) is used). In addition to the susceptibility question, the access determinant was also not correctly articulated. Access questions were “how difficult is to get/access the materials needed to do the behavior”? Hermetic storage questionnaire asked: “How difficult is it to make containers?” Intercropping questionnaire asked: “How difficult is it to intercrop pulses with maize?” The limitation is, therefore, that no reliable data was collected on the access determinant for either agriculture behavior.

Results

NUTRITION: LACTATING WOMEN EAT TWO EXTRA BOWLS OF FOOD EACH DAY

The key results of the BA on lactating women eating two extra bowls of food each day uncovered five significant determinants. Among the women interviewed, the key significant determinants include: self-efficacy, cue for action, access, and social norms.

Self-efficacy

In exploring the barriers and enablers of the behavior, the survey sought to better understand what skills and perceptions contribute or hinder lactating women to practice the behavior. Doers were 15 times more likely to state that breastfeeding increases her hunger compared to non-doers. Non-doers were three times more likely than doers to respond she would be able to eat extra bowls if “tasty food” were available. The findings identified promoting breastfeeding as a potential motivator and the tasty

Summary of Nutrition BA Finding

Barriers	Enablers
Lactating mothers eating two extra bowls each day	
<ul style="list-style-type: none"> • Self-efficacy: able to eat when there is tasty food (meat/eggs) • Limited Access 	<ul style="list-style-type: none"> • Self-Efficacy: Breastfeeding increases hunger • Social Norm: Husband approves
Mothers of children 6-23 months feed two different types of colorful fruit and vegetable each meal	
<ul style="list-style-type: none"> • Self-efficacy: unable to grow vegetables; no money • Access: Vegetables are not available all year • Low perceived susceptibility • Low perceived severity • Low action-efficacy 	<ul style="list-style-type: none"> • Self-efficacy: knowing the benefit • Positive consequence: Healthy baby grows strong

food, perceived as only meat, may be an important barrier to overcome. Additionally, there were insignificant results mentioned, including “no appetite” as a potential barrier, and respondents mentioned vitamins increasing appetite which would encourage eating more.

Cue for Action

Among lactating mothers, non-doers were 5.6 times more likely to report that remembering to eat extra bowls each day is somewhat difficult. Whereas, doers were three times more likely to report not difficult to remember. Cue to action may be a barrier to address in promoting increased consumption among lactating mothers. However, it may be a misperception among non-doers because they may not be aware of the promoted behavior. This implies a need for further investigation with mothers around their ability to remember to eat extra food each day.

Access

When inquiring about access, doers reported very difficult to access the materials needed to eat two extra bowls of food each day, five times more than non-doers. Doers are consuming extra bowls of food each day, despite the access barrier. This implies that access may be an unanticipated barrier among non-doers, which must be addressed in order for them to elicit the behavior.

Social Norms

Lactating mothers were asked who approves or disapproves of the behavior, and doers were two times more likely than non-doers to name husbands as approving of the behavior. Husbands are potential motivators of enabling and encouraging lactating mothers to eat two extra bowls each day.

NUTRITION: MOTHERS OF CHILDREN 6-23 MONTHS FEED HER BABY TWO DIFFERENT TYPES OF COLORFUL FRUIT/VEGETABLE AT EACH MEAL

In order to develop a contextualized social behavior change strategy in promoting diet diversity among children under two, the barrier analysis survey aimed to identify barriers and enablers of mothers in feeding her child aged 6-23 months two different types of colorful fruit and/or vegetable at each meal. The significant determinants include: self-efficacy, access, perceived positive consequences, perceived susceptibility, perceived severity, and perceived action efficacy.

Self-efficacy

Mothers practicing the behavior were 12 times more likely to respond that knowing the benefit made it easier to practice the behavior. Non-doers were five times more likely to report that the inability to grow vegetables hindered the practice of the behavior. However, although statistically insignificant, it is important to note that 69% of doers and 82% non-doers believed that having a home garden does and/or would make it easier to practice the behavior. This will reinforce the idea that access (through own production) is the key determinant of behavior, much more so that knowledge or attitudes as non-doers tend to already hold the ‘correct’ knowledge/belief. Lastly, doers were three times more likely to state unavailability of vegetables year-round as a barrier. This may be an anticipated barrier for non-doers as doers encounter this barrier, but are overcoming it. Additionally, among respondents, 29% of non-doers stated that lack of money made it difficult to practice the behavior. However, it is important to note this finding may be highlighting misconception on the part of non-doers. Non-doers may be perceiving “money” as purchasing vegetables and fruits or investing in materials for a home garden. Also, those not practicing the behavior may not understand fully what resources are needed to practice behavior.

Access

Under the self-efficacy determinant, responses linked to access were mentioned highlighting the importance of this determinant. Findings under the access determinant were as follows: non-doers were 4.2 times more likely to perceive access to materials to practice the behavior to be “very difficult” and doers were 3.2 times more likely to perceive it be “somewhat difficult.” These findings underlie the influence of access for both doers and non-doers in practicing the behavior.

Positive Consequences

Compared to mothers identified as doers, non-doers were 2.5 more likely to state that practicing the behavior contributes to a healthy baby growing up strong. Confirming that knowledge only is not enough, this finding is interesting, in that, even though non-doers are aware of the positive consequences, they still are not practicing the behavior. When considering this finding with the self-efficacy finding, doers were more likely to practice the behavior if they know the benefit, there arises some inconsistency among doer and non-doer responses in knowing the benefits enabling the behavior change.

Susceptibility and Severity

Non-doers were twice as likely compared to doers to report that the risk of malnutrition is not at all likely for her baby. Mothers not practicing the behavior do not perceive the risk of malnutrition to be high. Similarly, doers perceived severity or seriousness of malnutrition to be low or not serious compared to non-doers. However, doers are practicing the behavior despite thinking that malnutrition is not a serious problem. This finding demonstrates that both doers and non-doers perceive malnutrition to be of low risk and low seriousness, which brings to light two potential barriers to practicing the behavior. However, since doers also have the same belief as non-doers, the barriers may not be highly influential in eliciting behavior change.



Action Efficacy

In order to understand perceived efficacy of the behavior protecting against malnutrition, the survey found that doers were three times more likely to report that malnutrition is still somewhat likely even if they feed their baby two different types of vegetable or fruit each meal. Non-doers were 3.5 times more likely than doers to report that malnutrition is not likely at all if they were to practice the behavior, representing a positive attitude. Findings here are perplexing in that non-doers positive perceive the action efficacy of the behavior, but do not practicing the behavior despite the positive perception. Interestingly, those practicing the behavior still believe that malnutrition is likely despite practicing the behavior. Important to note is that the translation and multi-lingual understanding of malnutrition is to be considered closely when interpreting these findings. The results are mixed in that action efficacy, although significant, may not be effective in eliciting behavior change.

AGRICULTURE: MAIZE FARMERS STORE MAIZE SEEDS IN HERMETIC (AIR-TIGHT, WATER-PROOF) CONTAINERS

Self-Efficacy

Doers are 4.5 times more likely than non-doers to state that it is easy to use hermetic storage because they 'understand the benefits of hermetic storage' which implies that understanding the benefits of hermetic storage motivates farmer to use the behavior. Therefore, if other farmers know the benefits then they would be more likely to engage in the behavior. In addition, doers are 7.2 times more likely than non-doers to state that it is easy to use hermetic storage because they 'know how to select seeds' which implies that understanding seed



selection practices enables doers to practice hermetic storage. It may be that this is because, traditionally, seed is stored on-cob hanging at the various part of the house, but use of hermetic storage requires that kernels for seed are removed from cobs before storage. This is unexpected finding that the seed selection practices are enablers of hermetic storage. Therefore, HH are more likely to use hermetic storage if they understand the associated seed selection practices. There was misconception and lack of understanding among non-doers about what "hermetic storage" is, in that non-doers are 2.9 times more likely than doers to state that it would be easier to use hermetic storage if they 'had access to ash or other non-hermetic materials.'

Positive Consequences

Doers are 3.7 times more likely than non-doers to state that a positive consequence of hermetic seed storage is 'no pests and disease.' Farmers practicing the behavior, storing hermetically, were 3.7 times more likely than non-doers to understand that storing seeds hermetically protected their seeds from pests and disease. The findings implies that doers recognize one of the primary benefits of hermetic storage (reduced pest & disease damage), and that more farmers would start using hermetic storage if they shared this belief/knowledge.

Negative Consequences

Non-doers are 10.2 times more likely than doers to state that a negative consequence of hermetic seed storage is 'seed gets rotten and doesn't germinate'. This implies a misperception on the part of non-doers, indicating that non-doers do not fully understanding what hermetic storage is nor its benefits. This may also imply, as suggested by the self-efficacy result, above limited understanding about appropriate seed selection and storage practices that help to prevent rot during storage among non-doers.

Cue for Action

Non-doers are 3.1 times more likely than doers to state that it is ‘very difficult to remember to use hermetic storage.’ Similarly, doers are 2 times more likely than non-doers to state that it is ‘not difficult at all to remember to use hermetic storage.’ This highlights ability to remember to use hermetic storage as motivator of behavior among doers, as well as a barrier to behavior among non-doers. However, when interpreted along with other results, suggesting very low levels of understanding about hermetic storage among non-doers, it may be that this is more of an issue of lack of awareness, rather than an inability to remember because one cannot remember to practice a behavior if he or she does not know what the behavior entails.

Susceptibility

Non-doers are 5.7 times more likely than doers to state that it is ‘very likely that stored seed will be damaged by pests or water’ on the other hand doers are 12.5 times more likely than non-doers to state that it is ‘not likely at all that seed will be damaged by pests or water.’ This implies that doers are realizing the benefits of hermetic storage, as they believe that their seed, which is being hermetically stored, is unlikely to be affected by pest or water damage. Non-doers, on the other hand, perceive that pest or water damage to seed is very likely to occur with traditional storage methods.



Severity

Non-doers are 2.8 times more likely than doers to state that it would be ‘somewhat serious if stored seed is damaged by pests or water.’ “Somewhat serious” is difficult to interpret, and the other non-significant response options are also inconclusive: (a) A greater proportion of doers (72%) than non-doers (64%) believed that it would be ‘very serious’, (b) A greater proportion of doers (15%) than non-doers (4%) believed that it would be ‘not serious at all.’ Given these results, it is unclear whether the perceived severity of seed damage is greater among doers or non-doers, and therefore how this perception influences behavior is also unclear.

Action Efficacy

Non-doers are 3.6 times more likely than doers to state that it is ‘somewhat likely that hermetically-stored seed will be damaged by pests or water’ but doers are 4 times more likely than non-doers to state that it is ‘not likely at all that hermetically-stored seed will be damaged by pests or water.’ This indicates that doers have higher awareness about the benefits of hermetic storage than non-doers, and that this awareness determines the behavior.

AGRICULTURE: FARMERS PLANT A LEGUMINOUS CROP IN THE SAME FIELD AS THEIR STAPLE CROP

Barriers	Enablers
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Maize farmers store maize seeds in hermetic containers	
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<p>Self-efficacy:</p> <ul style="list-style-type: none"> Misconception and lack of understanding about what is 'hermetic storage' 	<p>Self-Efficacy:</p> <ul style="list-style-type: none"> know the benefits of hermetic storage know how to select seeds
<p>Negative Consequence</p> <ul style="list-style-type: none"> Misconception of hermetic storage that 'seed gets rotten and doesn't germinate' 	<p>Positive Consequence</p> <ul style="list-style-type: none"> Hermetic storage seed has 'no pests and disease'

Farmers plant a leguminous crop in the same field as their staple maize crop during the same season	
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<p>Self-efficacy:</p> <ul style="list-style-type: none"> Weeding makes it difficult to intercrop maize and pulse 	<p>Positive Consequence</p> <ul style="list-style-type: none"> Intercropping saves time and labor. Produce more on total yield
<p>Negative Consequence</p> <ul style="list-style-type: none"> Rats or birds climb up and eat maize 	<p>Action Efficacy</p>



DURING THE SAME SEASON

Self-Efficacy

Doers are 3.5 times more likely than non-doers to state that 'weeding makes it difficult to intercrop maize and pulses.' This may mean that weeding makes it difficult to produce maize and pulses in the same field, as care must be taken not to damage pulse plants during weeding, which could potentially add to the time and labor requirements of weeding. As difficulties associated with weeding were more frequently mentioned by doers than non-doers, the implication is that weeding is more challenging when pulses and maize are intercropped, but this extra burden has not prevented doers from engaging in the behavior. This implies that the weeding requirements for intercropped maize and pulses may be an unanticipated barrier for non-doers.

Positive Consequences

Doers are 5 times more likely than non-doers to state that a positive consequence of producing maize and pulses in the same field is that it 'saves time and labor.' This implies that farmers are more likely to produce maize and pulses in the same field if they believe that intercropping saves time and labor for production. Somewhat contradictory to the Self Efficacy determinant related to weeding (above), but the interpretation of these results together is that time and labor, including for weeding, is an important determinant of the behavior.

Negative Consequences

Doers are 3.2 times more likely than non-doers to state that a negative consequence of producing maize and pulses in the same field is that 'rats or birds climb up and eat maize.' It implies that farmers perceive greater damage to the maize crop from rats or birds when pulses and maize are intercropped. Assumed that this applies primarily to climbing beans, rather than dwarf or bush beans. This response *may* represent a misconception, as rats may be just as able to climb up a maize plant with a climbing bean as without, and it is unclear how bean plants would facilitate access for

birds (particularly through climbing). However, as this was mentioned more frequently by doers than non-doers, it is likely that doers are 'speaking from experience,' and that there may be some causal mechanism that means greater rat and bird damage during intercropping. Whatever the reason though, rat or bird damage has not prevented doers from engaging in the behavior, but this might represent an unanticipated barrier for non-doers.

Action Efficacy

Doers are 2.2 times more likely than non-doers to state that it is 'somewhat likely that intercropped maize and beans will be damaged by pests.' "Somewhat likely" is difficult to interpret, but, as a greater proportion of non-doers (58%) than doers (44%) believe that it would be not likely at all, the implication is that doers are more likely to perceive that intercropping maize and beans is not effective in preventing the problem of pest damage. This is somewhat counter-intuitive, as intercropping is intended as a mechanism to help reduce pest damage, but this result indicates that the opposite is perceived to be true in Chin, with farmers perceiving a greater risk of pest damage when maize and pulses are intercropped than in pure maize stands. As this perception was more commonly held by doers, the implication is that they are 'speaking from experience,' and that there really is a greater risk of crop damage when maize and pulses are intercropped, but despite this, they are still engaged in the behavior. It also strongly suggests that messaging about the benefits of intercropping include pest control would be highly ineffective in changing behavior. Crop damage is also likely to be an anticipated barrier that could discourage adoption of intercropping among non-doers.

Discussion

NUTRITION: LACTATING WOMEN EAT TWO EXTRA BOWLS OF FOOD EACH DAY

Bridge to Activities. To promote social behavior change among lactating mothers to adopt this behavior, the PACE project will implement key activities that address the barriers and enablers identified. Thus, the bridge to activities are links between the determinant and an activity, as well as a planned change in a determinant. There is usually one bridge to activity for each determinant found to be important to the chosen Behavior. PACE Activities aim to address and achieve the following bridge to activities developed from the significant findings:

- Increase skills to prepare meals mothers would enjoy using nutritious locally available ingredients
- Reduce the perception that meat is only good or tasty food/meal
- Increase ability to remember to eat two extra bowls each day while breastfeeding
- Increase access of staple and nutritious crops year-round
- Increase perception among husbands providing for the family includes supporting lactating wife to eat two extra bowls

Key Activities. The key activities entail 1) home visits by the Lead Mothers of the Karuna Mother Groups (KMG) as known as the adapted Care Groups and 2) cooking demonstrations every quarter. During the home visits and cooking demonstrations, Lead Mothers will promote Essential Nutrition and Hygiene Actions and support meal preparation with pregnant and lactating mothers. Additionally, the nutrition activities focus keenly on engagement of the husband during home visits and other community nutrition events and activities. A key focus is to improve perceptions that meals prepared with locally available foods can be tasty and nutritious, building on current practices and cultural norms. From the agriculture and production perspective, activities to improve year-round access to nutritious food will include hermetic storage to reduce post-harvest losses of maize and pulse grain, improved agronomic practices to increase maize yield, and kitchen gardens that will allow continued production of nutritious vegetables during the dry season.

To support cues to action about extra bowls during lactation, PACE plans to develop and distribute IEC materials, such as feeding wheels with messages and recipes for mother and baby during the different stages of the 1000 days. This feed wheel would be a reminder and guidance on promoted maternal nutrition and IYCF practices to be displayed and utilized in the meal preparation area of the home. Given the varying languages in the target areas, PACE intends gather supplemental data from community members regarding this type of SBCC tool and field test to ensure appropriateness, relevance, and utilization.

Further Exploration Needs. Amid the BA results, there were non-significant findings that may need further exploration to contribute to a sound SBCC approach in promoting consumption of extra two bowls of food every day while breastfeeding. These include difficulties in practicing the behavior, positive and negative consequences, susceptibility, severity, and action efficacy. When inquiring about difficulties that hinder the practice of the behavior, elucidating responses were scant among the 90 respondents. Access to “good food,” as understood by respondents as meat and eggs, is clearly a barrier for both doers and non-doers, however there were other responses about time and labor, vitamin supplements to help appetite, and poor health, which focus groups discussions can help elucidate further. Similarly, consumption of additional food during lactating is linked strongly with breastmilk production among both doers and non-doers. Respondents perceived eating more with benefits to baby’s growth and development and energy for mothers. Though these were non-significant findings, PACE needs to explore them further to inform SBCC material and messaging. Mixed perceptions of susceptibility and severity among both doers and non-doers highlight the need for SBCC approaches and activities to augment access and skills—going beyond awareness and knowledge. Likewise, doers and non-doers perceived eating more would prevent the issue of insufficient breastmilk production. Additional exploration with PLWs is needed to develop a deeper understanding of the perceptions to incorporate them into effective and evoking messages and counseling.

NUTRITION: MOTHERS OF CHILDREN 6-23 MONTHS FEED HER BABY TWO DIFFERENT TYPES OF COLORFUL FRUIT/VEGETABLE AT EACH MEAL

Bridge to Activities. Drawing from results of the BA, bridges to activities are the actionable results considered closely to inform and ensure program activities confront identified barriers and enablers. To ensure the most effective and relevant activities, the bridges to activities developed for mothers of children 6-23 months to feed her baby two difference types of colorful fruit and/or vegetables each day include the following:

- Increase ability to grow nutritious vegetables
- Increase perception that people can grow nutritious vegetable in home gardens with little money
- Increase ability to access at least two nutritious vegetable and fruit year-round
- Increase the skill to prepare balanced diet with locally available foods
- Increase perception that feeding baby two or more colorful fruit and veg helps baby to grow healthy and strong
- Increase perception that malnutrition is likely for baby not eating 2+ fruit/veg each day
- Increase perception that malnutrition for children under two years old is severe/serious
- Increase perception when you feed your child 6-23 months at least two types of colorful fruits and vegetable each day it protects against malnutrition

Key Activities. The aforementioned activities are the central approach PACE will implement in addressing the bridges to activities for this behavior. This includes home visits, cooking demonstrations, and kitchen gardens. Home visits with volunteers and PLWs aim to improve perception through promotion of the ENAs and peer-to-peer support in developing mutual understanding about the issues, identifying and collectively overcoming challenges, and trying new behaviors for short periods of time. The cooking demonstrations are led by volunteers with support by the project staff with PLWs to develop skills to prepare meals for baby including, but not limited to, at least two colorful fruit and

vegetables that are locally available. Demonstrations provide an opportunity for practical skill building and coaching as the groups of neighborhood women share challenges and mutually consider ways to assuage barriers.



Another PACE activity, the kitchen garden support, intends to improve perceptions and increase ability of mothers and family members to access diverse, nutritious crops year round sufficient for mother and baby. As dry season greatly hinders year-round vegetable production, PACE plans to demonstrate grey water drip irrigation, using low-cost, locally available resources, in kitchen gardens to enable vegetable cultivation during the dry season, when lack of access to water prevents many families from growing vegetables. Lastly, to improve the perception that children are at risk of malnutrition and that

malnutrition is serious requires community-wide activities. Therefore, PACE supports community members with agriculture demonstrations where project staff link and harmonize agriculture and nutrition promotion, but as related to and supported by the role of the farmer. Likewise, community-wide activities such as religious leader and health worker engagement and feeding and learning events contribute to building an awareness and importance of undernutrition, as well as develop skills to tackle the issue in current capacities and roles i.e. farmer, husband, mother, grandmother etc.

Further Exploration Needs. Though the BA results reveal several significant barriers and enablers, there are a few responses where further inquiry is needed to add depth and rich understanding of perceptions among the priority group. These include the water needs for home gardens, money to increase access to vegetables, vitamins, negative consequences, and action efficacy. However, the BA results find that among the priority group, limited water during dry season is not identified as a barrier even though the survey was conducted during the dry season. Further investigation is needed to confirm PRA results, which identified water as a barrier for home gardens.



Subsequently, money was reported as a challenge. As Chin is one of the most impoverished states in Myanmar, it is expected that money is a major challenge. However, with impending cash transfer programs in Chin, better understanding these money-related perception is required to inform and ensure responsive programmatic decisions. For example, the project needs to better understand whether community members are referring to lack of money about purchasing vegetables or growing vegetables in a garden. Similarly, it would be beneficial to understand how people spend their money currently as there are communities have limited access to markets.

Mothers also mentioned vitamins as a positive consequence, which indicates that there may be an emic definition of good nutrition specific to Chin that the project should understand and apply in SBCC promotion. Through previous PRAs, mothers named indigestion, time and work load, and a few foods that do not mix well in the body when discussing complementary feeding. However, those were not reflected in the BA findings. PACE should consider more discussions with the priority group, perhaps through the Karuna Mother Groups and neighbor women to ensure a firm understanding of the perception negative consequences of diverse diets for children 6-23 months. The BA also found

that perceived action efficacy is high among the priority group, but not adequate to elicit the behavior change. When practicing the behavior, doers think malnutrition is still somewhat likely, whereas non-doers perceive malnutrition to be not at all likely, which is surprising. Perhaps the malnutrition used in the BA was not specific enough for the population and problematic in translation and understanding. Therefore, more inquiry on a specific malnutrition-related problem among children is needed i.e. diarrhea, colds, respiratory infections. Additionally, the emic definition of malnutrition as well as good nutrition is essential to This will inform the program to ensure messages, counseling, and skills are promoted to tackle perceived disease or problem that is most relatable and context-specific.

AGRICULTURE: MAIZE FARMERS STORE MAIZE SEEDS IN HERMETIC (AIR-TIGHT, WATER-PROOF) CONTAINERS

Bridge to Activities. To promote behavior change among farmers to adopt this behavior, the PACE project will aim to address and achieve the following bridge to activities developed from the significant determinants:

- Improve understanding about the benefits of hermetic seed storage
- Increase the perception that practicing hermetic storage including healthy plant & cob selection improves to know the good seeds
- Increase understanding about low-cost, locally available hermetic seed storage technology options
- Increase the perception that hermetic seed storage can prevent pest or disease damage
- Decrease the perception that hermetically-stored seed will become rotten and fail to germinate
- Reduce the perception that it is very difficult to remember to store on hermetic storage in one month after harvesting
- Increase the perception that it is not difficult at all to remember to store on hermetic storage in one month after harvesting
- Increase the perception that hermetic storage prevents pest or water damage to maize seed
- Increase the perception that pest or water damage to maize seed is a very serious problem
- Increase the perception that hermetic storage prevents pest or water damage to maize seed

Key Activities. PACE will promote the whole process of seed selection practice which includes selection and marking of healthy plant in the field, healthy cob selection, drying to appropriate moisture, dehulling the central part of the cob, and placing in an airtight water proof container. This seed selection process will be done through community demonstration sessions. Importantly, the BA finding confirmed the appropriateness of the PACE strategy and provide guidance on how best to make minor adaptations for improved effectiveness of the strategy. These include sharing success stories, farmer exchanges, comparison of pest/disease and rotting damage between traditional and hermetically stored seed, and germination comparison between traditional and hermetic storage. Comparisons of hermetic and traditional stored seeds will be conducted before the sowing time, and germination comparison between hermetic seeds and traditional storage seeds will do during thinning season. Moreover, PACE will closely consider and apply findings when developing IEC materials, such as job aid and brochures, for community demonstration sessions and reference for farmers.

AGRICULTURE: FARMERS PLANT A LEGUMINOUS CROP IN THE SAME FIELD AS THEIR STAPLE CROP DURING THE SAME SEASON

Bridge to Activities. To promote behavior change among farmers to adopt this behavior, the PACE project will aim to address and achieve the following bridge to activities developed from the significant findings:

- Increase the perception that there is less weed when we do intercropping maize and pulses
- Increase the perception that intercropping maize and beans saves time and labor when we compare the total yield

- Reduce the occurrence of rat/bird damage to intercropped maize and pulses
- Reduce the occurrence of pest damage to intercropped maize and pulses

Key Activities. PACE will conduct community demonstration session on intercropping maize with pulses. The community demonstration is aim to improve their perception of growing maize with pulses which include save labor, increase the total yield as well as provide better nutrition and diversity for their family. PACE will also provide message about management of rat and bird (e.g. feeding the mixture of sticky rice with cement to rat therefore, they can't defecate well and biting each other). Moreover, PACE will develop IEC materials closely considering and applying the findings from this barrier analysis and significant determinants.

Further Exploration Needs. There is a need to understand more about what motivates or enables doers to intercrop maize and pulses. Many of the significant determinants represent barriers which have been overcome by doers (that is they are doing the behavior despite the barriers), so more investigation of what motivates or encourages doers to do the behavior despite the barriers identified is needed. The project also needs to better understand about weeding, specifically what is it about weeding that makes intercropping difficult; and is time/effort to care for the bean plant a major barrier. With further exploration, this will enable identification of appropriate interventions to address this determinant. Prevalence of rat and bird damage and pest damage when intercropping is another area for further investigation. All these future inquiries are critical to better understand how best and effectively to counsel and encourage farmers to produce multiple varieties to reach the targets.

Table 4. Significant Determinants and Findings

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
NUTRITION				
1. Lactating mothers eat two extra meal each day				
Self-Efficacy	<ul style="list-style-type: none"> • Breastfeeding increases hunger (Motivator) • Able to eat when there is tasty food (Barrier) 	<ul style="list-style-type: none"> • Doers are 15 times more likely state hungry while breastfeeding compared to non-doers • Non-doers are 3 times more likely to state able to eat when there is tasty food compared to doers 	<ul style="list-style-type: none"> • Increase skills to prepare meals mothers would enjoy eating using nutritious locally available ingredients • Reduce the perception that meat is only good food/meal 	<ul style="list-style-type: none"> • Promote continued breastfeeding during IYCF in KMGs and home visits • Conduct cooking clubs with PLWs to demonstrate and taste different nutrient dense recipes using locally and seasonally available foods for mom and baby
Cues for Action	<ul style="list-style-type: none"> • Somewhat difficult (Barrier) • Not difficult (Motivator) 	<ul style="list-style-type: none"> • Non-doers were 5.6 time more likely to state somewhat difficult • Doers were 3 times more likely to state not difficult 	<ul style="list-style-type: none"> • Increase ability to remember to eat two extra bowls each day while breastfeeding 	<ul style="list-style-type: none"> • Develop reminder IEC materials (recipes wheels) with diet diversity recommendations for mom and baby at different stages of the 1000 days.

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Access	<ul style="list-style-type: none"> Very difficult (Anticipated barrier) 	<ul style="list-style-type: none"> Doers are 5 times more likely to state very difficult access compared to non-doers 	<ul style="list-style-type: none"> Increase access to staple and nutritious crops year-round 	<ul style="list-style-type: none"> Conduct and support home garden demonstrations with PLWs that enable year-round cultivation of nutritious vegetables Agronomic and seed selection/storage practices to increase maize yield & hermetic grain storage to reduce post-harvest losses of maize & pulses
Social Norms	<ul style="list-style-type: none"> Husband (Motivator) 	<ul style="list-style-type: none"> Doers 2 times more likely to state that husbands approve compared to non-doers 	<ul style="list-style-type: none"> Increase perception among husbands providing for the family includes supporting lactating wife to eat two extra bowls 	<ul style="list-style-type: none"> Invite husbands to KMG meetings, once every 6 months Conduct community wide events to promote ENA with husbands LMs conducts a meeting with husbands and moms to promote monthly message and counseling

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
2. Mothers of children 6-23 months feed her baby two different types of colorful vegetables and fruits at each meal				
Self-efficacy	<ul style="list-style-type: none"> • Know the benefit (Motivator) • Unable to grow vegetables (Barrier) • Vegetables are not available year round (Anticipated barrier) • No money (barrier) 	<ul style="list-style-type: none"> • Doers are 12 times more likely to state know the benefit compared to non-doers • Non-doers are 5 times more likely to state unable to grow veg compared to doers • Doers are 3 times more likely to state veg are not available year round compared to non-doers • 29% of non-doers stated that lack of money was a barrier 	<ul style="list-style-type: none"> • Increase ability to grow nutritious vegetables • Increase perception that people can grow nutritious vegetable in their home garden with little money • Increase ability to access at least two nutritious vegetable and fruit year-round • Increase the skill to prepare balanced diet with locally available and harvested foods requiring little to no additional financial investment 	<ul style="list-style-type: none"> • Conduct home garden demonstrations with PLWs using low-tech, low-cost techniques and varieties that enable year-round cultivation
Access	<ul style="list-style-type: none"> • Very difficult to somewhat difficult to access materials needed to practice the behavior 	<ul style="list-style-type: none"> • Non-doers were 4.2 times more likely to perceive access to be “very difficult” • Doers were 3.2 times more likely to perceive it be “somewhat difficult.” 	<ul style="list-style-type: none"> • See above self-efficacy 	<ul style="list-style-type: none"> • See above self-efficacy

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Positive Consequences	<ul style="list-style-type: none"> Healthy baby grows strong (Motivator) 	<ul style="list-style-type: none"> Non-doers are 2.5 times more likely to state healthy baby grows strong compared to doers 	<ul style="list-style-type: none"> Increase perception that for a baby to grow healthy and strong, baby needs 2+ colorful fruit and veg at each meal 	<ul style="list-style-type: none"> Conduct KMG meetings and home visits to share the benefits of diverse diets for baby Hold community wide events to sensitize and raise support for diet diversity for mom and baby
Susceptibility	<ul style="list-style-type: none"> Not likely at all (Barrier) 	<ul style="list-style-type: none"> Non-doers are 2 times more likely to report malnutrition somewhat likely compared to doers 	<ul style="list-style-type: none"> Increase perception that malnutrition is likely for baby not eating 2+ fruit/veg at each meal 	<ul style="list-style-type: none"> Include problem identification and discussions in monthly lessons activities to raise awareness and local understanding of malnutrition as it impacts Chin i.e. demonstration of which children in the village are stunted or undernourished using MUAC
Severity	<ul style="list-style-type: none"> Not serious at all (Barrier) 	<ul style="list-style-type: none"> Doers are 2.5 times more likely to state not serious at all compared to non-doers 	<ul style="list-style-type: none"> Increase perception that malnutrition for children under two years old is severe/serious 	<ul style="list-style-type: none"> Include in monthly lessons activities to raise awareness and local understanding of malnutrition as it impacts Chin, educational attention, economic future, etc.
Action Efficacy	<ul style="list-style-type: none"> Somewhat likely (Barrier) Not likely at all (Motivator) 	<ul style="list-style-type: none"> Doers are 3 times more likely compared to non-doers Non-doers are 3.5 times more likely compared to doers 	<ul style="list-style-type: none"> Increase perception when you feed your child 6-23 months at least two types of colorful fruits and vegetable each day it does effectively protects against malnutrition 	<ul style="list-style-type: none"> Include in KMG lessons and activities the effectiveness of diet diversity among children 6-23 months from neighboring countries.

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
AGRICULTURE				
1. Maize famers store maize seeds in hermetic (air-tight, water-proof) containers				
Self-Efficacy	<ul style="list-style-type: none"> Know the benefits of hermetic storage (motivator) 	<ul style="list-style-type: none"> Doers are 4.5 times more likely to state 'know the benefits of hermetic storage' compared to non-doers 	<ul style="list-style-type: none"> Improve understanding about the benefits of hermetic seed storage 	<ul style="list-style-type: none"> Development of IEC materials. Sharing success story about hermetic storage Farmer exchanges on their learning Production demonstration groups
	<ul style="list-style-type: none"> Know how to select seeds (motivator) 	<ul style="list-style-type: none"> Doers are 7.2 times more likely to state 'know how to select seeds' compared to non-doers 	<ul style="list-style-type: none"> Increase knowledge about seed selection 	<ul style="list-style-type: none"> Production demonstration groups seed selection such as healthy plant & cob selection, and dehulling mid-section of the cob for seed
	<ul style="list-style-type: none"> Have access to non-hermetic materials (motivator) 	<ul style="list-style-type: none"> Non-doers are 2.9 times more likely to state 'have access to non-hermetic materials' compared to doers 	<ul style="list-style-type: none"> Increase understanding about low-cost, locally available hermetic seed storage technology options 	<ul style="list-style-type: none"> Facilitate hermetic seed storage learning session & demonstration
Positive Consequences	<ul style="list-style-type: none"> No pests and disease (motivator) 	<ul style="list-style-type: none"> Doers are 3.7 times more likely to state 'no pests and disease' compared to non-doers 	<ul style="list-style-type: none"> Increase the perception that hermetic seed storage can prevent pest or disease damage 	<ul style="list-style-type: none"> Facilitate hermetic seed storage demonstration Facilitate comparison of pest/disease damage between hermetic- and traditionally-stored seed

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Negative Consequences	<ul style="list-style-type: none"> Rotten seed that doesn't germinate (barrier) 	<ul style="list-style-type: none"> Non-doers are 10.2 times more likely to state 'seed gets rotten and doesn't germinate' compared to doers 	<ul style="list-style-type: none"> Decrease the perception that hermetically-stored seed will become rotten and fail to germinate 	<ul style="list-style-type: none"> Facilitate hermetic seed storage demonstration Facilitate comparison of rot between hermetic- and traditionally-stored seed Plant hermetically stored-seed in maize/bean demo plots (and incorporate germination comparison session into learning curriculum)
Cue for Action	<ul style="list-style-type: none"> Very difficult to remember to use hermetic seed storage (barrier) Not difficult at all to remember to use hermetic seed storage (motivator) 	<ul style="list-style-type: none"> Non-doers are 3.1 times more likely to state 'very difficult to remember' compared to doers Doers are 2 times more likely to state 'not difficult at all to remember' compared to non-doers 	<ul style="list-style-type: none"> Increase the ability to remember to store on hermetic storage in one month after harvesting 	<ul style="list-style-type: none"> Community Demonstration session on hermetic seed storage in one month after harvesting IEC materials and promotion activities i.e. calendar, community event

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Susceptibility	<ul style="list-style-type: none"> • Very likely that stored maize seeds will be damaged by pests or water (motivator) • Not likely at all that stored maize seeds will be damaged by pests or water (motivator) 	<ul style="list-style-type: none"> • Non-doers are 5.7 times more likely to state 'very likely that seed will be damaged' compared to doers • Doers are 12.5 times more likely to state 'not likely at all that seed will be damaged' compared to non-doers 	<ul style="list-style-type: none"> • Increase the perception that hermetic storage prevents pest or water damage to maize seed 	<ul style="list-style-type: none"> • Facilitate hermetic seed storage demonstration • Facilitate comparison of pest/water damage between hermetic- and traditionally-stored seed
Severity	<ul style="list-style-type: none"> • Somewhat serious if stored maize seeds damaged by pests or water (motivator/barrier) 	<ul style="list-style-type: none"> • Non-doers are 2.8 times more likely to state 'somewhat serious if seed is damaged' compared to doers 	<ul style="list-style-type: none"> • Increase the perception that pest or water damage to maize seed is a very serious problem 	<ul style="list-style-type: none"> • Community Demonstration session on hermetic storage seeds and traditional storage seeds, germination, and yield comparison

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Action Efficacy	<ul style="list-style-type: none"> • Somewhat likely that hermetically-stored seed will be damaged by pests or water (motivator/barrier) • Not likely at all that hermetically-stored seed will be damaged by pests or water (motivator) 	<ul style="list-style-type: none"> • Non-doers are 3.6 times more likely to state 'somewhat likely that hermetically-stored seed will be damaged' compared to doers • Doers are 4 times more likely to state 'not likely at all that hermetically-stored seed will be damaged' compared to non-doers 	<ul style="list-style-type: none"> • Increase the perception that hermetic storage prevents pest or water damage to maize seed 	<ul style="list-style-type: none"> • Facilitate hermetic seed storage demonstration • Facilitate comparison of pest/water damage between hermetic- and traditionally-stored seed

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
2. Farmers plant a leguminous crop in the same field as their staple crop during the same season				
Self-Efficacy	<ul style="list-style-type: none"> Weeding makes it difficult to grow pulses in the same field as maize (barrier) 	<ul style="list-style-type: none"> Doers are 3.5 times more likely to state that 'weeding makes it difficult' compared to non-doers 	<ul style="list-style-type: none"> Increase the ability to weed in an efficient manner that reduces time/labor when intercropping. 	<ul style="list-style-type: none"> Intercropping maize and leguminous crop in the demo plot. With spacing or seeding together in the same hole, it is easier to identify pulse crops as they germinate and grow. Farmers will also be taught to wait to weed (a couple weeks) until they can identify the pulse plants easily.
Positive Consequences	<ul style="list-style-type: none"> Growing pulses in the same field as maize saves time and labor (enabler) 	<ul style="list-style-type: none"> Doers are 5 times more likely to state 'saves time and labor' compared to non-doers 	<ul style="list-style-type: none"> Increase the perception that intercropping maize and beans saves time and labor when we compare the total yield 	<ul style="list-style-type: none"> Sharing from farmers that intercrop and believe that it saves time and labor Compare total yield between demo plot where maize & pulses are intercropping and traditional plot (including reflection session on amount of time/labor required compared to amount of food produced)

DETERMINANT	SIGNIFICANT RESPONSE/CODE	DOERS VS. NON-DOERS	BRIDGE TO ACTIVITY	ACTIVITY
Negative Consequences	<ul style="list-style-type: none"> It's easy for birds or rats to climb up and eat maize cobs if pulses are grown in the same field (barrier) 	<ul style="list-style-type: none"> Doers are 3.2 times more likely to state that 'rats or birds climb up and eat maize' compared to non-doers 	<ul style="list-style-type: none"> Decrease the perception that intercropping leads to increased rat/bird damage 	<ul style="list-style-type: none"> Find out how much is the problem on rate and bird and provide message to farmer about management of rate and bird if necessary i.e. feeding the mixture of sticky rice with cement to rat therefore, they can't defecate well and biting each other
Action Efficacy	<ul style="list-style-type: none"> Somewhat likely that intercropped maize and beans will be damaged by pests (barrier) 	<ul style="list-style-type: none"> Doers are 2.2 times more likely to state 'somewhat likely' compared to non-doers 	<ul style="list-style-type: none"> Reduce the occurrence of pest damage to intercropped maize and pulses 	<ul style="list-style-type: none"> Find out the source of pest and conduct PDGs to counsel on possible solution message to farmer

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Annexes

- Annex 1 - Description for DBC framework and Barrier Analysis study
- Annex 2 - Data Collectors, Data Collection Teams and Team supervisors
- Annex 3 - Data Collection Schedule, Communities Visited each day by teams
- Annex 4 - DBC frameworks for agriculture and nutrition
- Annex 5 - Questionnaires used during BA

Designing for Behavior Change and BA study

Term Definitions

Determinant of Behavior:

A category of factors shown to motivate a given group of people to practice a behavior.

Definition of Bridges to Activities:

Based on the answers given by the priority group during the formative research, Bridge the Activities are more precise descriptions of what to do to address the barrier revealed by research. A Bridge to the Activity usually begins with a directional verb (increase, decrease, improve, strengthen) and often refers to changing the perception of the priority group. It is not expressed in percentages. It always refers to the priority group.

Important Determinants that Influence Behavior

The Three Most Powerful Determinants listed below should always be explored in formative research on determinants (e.g., Barrier Analysis or Doer-Non Doer Studies). These three are more commonly found to be the most powerful for health/nutrition behaviors:

- 1. Perceived Self-efficacy/Skills** - an individual's belief that he or she can do a particular behavior given their current knowledge and skills; the set of knowledge, skills or abilities necessary to perform a particular behavior.
- 2. Perceived Social Norms:** perception that people important to an individual think that s/he should do the behavior; norms have two parts: who matters most to the person on a particular issue, and what s/he perceives those people think s/he should do.
- 3. Perceived Positive or Negative Consequences:** what a person thinks will happen, either positive or negative, as a result of performing a behavior. Responses to questions related to positive/negative consequences may reveal advantages (benefits)/disadvantages of the behavior, attitudes about the behavior, and perceived positive and negative attributes of the action.

Other Key Determinants:

4. Access: The degree of availability (to a particular audience) of the needed products (e.g., fertilizer, ITNs, condoms) or services (e.g., veterinary services, immunization posts) required to adopt a given behavior. This also includes an audience's comfort in accessing desired types of products or using a service.

5. Cues for Action / Reminders: The presence of reminders which help a person to remember to do a particular behavior or remember the steps involved in doing the behavior. This also includes key powerful events that triggered a behavior change in a person (e.g., "my brother-in-law got AIDS"; "the drought happened"). Examples of reminders are radio announcements reminding people of the date and location of a seedling distribution post and a sticker with the steps on how to plant a particular type of seed. Please remember that people are sometimes unaware of these cues for action.

6. Perceived Susceptibility/Risk: a person's perception of how vulnerable they feel to the problem. For example, do they feel that it's possible that their crops could have cassava wilt? Is it possible for them to become HIV+?

7. Perceived Severity: Belief that the problem (which the behavior can prevent) is serious. A farmer may be more likely to take steps to prevent aflatoxin infection of stored harvest if he perceives it to be a serious problem that could cause harm. A mother may be more likely to take her child for immunizations if she believes that measles is a serious disease. (This is related to perceived consequences.)

Note: Both perceived susceptibility and perceived severity relate to the problem NOT to the behavior.

8. Perceived Action Efficacy –The belief that by practicing the behavior one will avoid the problem, that the behavior is effective in avoiding the problem. Example: If I sleep under a mosquito net, I won't get malaria. (This determinant is sometimes just talked about as part of "perceived consequences.")

9. Perception of Divine Will: a person's belief that it is God's will (or the gods' will) for her/him to have the problem; and /or to overcome it. Numerous unpublished BA studies have found this determinant to be important for many behaviors (particularly for health and nutrition behaviors).

10. Policy: laws and regulations that affect behaviors and access to products and services. For example, the presence of good land title laws (and clear title) may make it more likely for a person to take steps to improve their farm land. A policy of automatic HIV testing during antenatal visits may make it more likely for women to have HIV testing. Policy often affects "enablers and barriers," things that make it easier or more difficult to do a behavior.

11. Culture: the set of history, customs, lifestyles, values and practices within a self- defined group. May be associated with ethnicity or with lifestyle, such as "gay" or "youth" culture. Culture often influences perceived social norms.

What is a Doer/Non-doer/Barrier Analysis Study?

- a. **How is Doer / Non-Doer Survey different from Barrier Analysis?** Doer/Non-Doer Analysis is very similar to Barrier Analysis, as they both focus on comparing Doers and Non-Doers. The Doer/Non-Doer Survey focuses on 5 (4 – if you don't split Positive and Negative Consequences) determinants, and six questions: Perceived Positive and Negative Consequences (what are the advantages and disadvantages of the behavior), Perceived Social Norms (who approves and disapproves of the behavior), and Perceived Barriers and Enablers (what makes it easier and harder). The original Doer/Non-Doer Analysis methodology recommended a smaller sample size and different form of analysis, but we recommend using the same sample size and type of analysis as used with Barrier Analysis if you choose to do Doer/Non-Doer Analysis. Doer/Non-Doer Analysis can take a bit less time given that it involves fewer questions, but it is important to ensure that you are not leaving out potentially important determinants of the behavior under study. When in doubt, use Barrier Analysis and explore the full set of determinants that you think may influence the behavior you are studying.
- b. **How many determinants are explored in Barrier Analysis?** Barrier Analysis examines the three most important determinants and up to eight other behavioral determinants. It is best to measure as many of the determinants as possible so as not to miss important determinants that may be driving the behavior. It is difficult to know ahead of time which determinants will turn out to be important ones.
- c. **Who is interviewed?** In Doer/Non-doer and BA, the questions are asked of individuals from the

Priority Group; their responses are compared based on whether they are Doers or Non-Doers. (If they practice the behavior, they are considered “Doers”).

- d. **Who interviews Doers? Non-Doers?** All interviewers should be trained in the doer/non-doer methodology. It is best to have all interviewers interview some Doers and some Non-Doers (rather than having a given interviewer interview only Doers or only Non-Doers). This helps to avoid finding trends that are purely a result of how a particular interviewer asked the question or recorded the responses. If you have one person interviewing and one person recording the responses, be sure to have the two swap roles during the survey.
- e. **Can the same person be interviewed concerning more than one behavior?** If you are conducting more than one Doer/non-doer/ Barrier Analysis at the same time, it is best to avoid asking the same person about multiple behaviors. Doing so can lead to over-taxing the respondent, and lead to their providing incomplete or not well thought out responses as they grow weary of being interviewed.
- f. **What sample size should be used?** A sample size of 45 or more individual interviews of Doers, and 45 or more individual interviews with Non-Doers usually gives the best results in Barrier Analysis.
- g. **What type of sampling should be used?** This study is similar to a case-control study, so it is not necessary to have as rigorous a sampling method or to use population-based sampling like you would for other types of surveys (e.g., KPC surveys). However, in order for your results to be representative of most of the people in the area, it is good to draw your respondents from different communities. For example, in order to obtain 45 Doers and 45 Non-Doers, it would be good to interview 5 Doers and 5 Non-Doers from each of nine different communities rather than selecting them all from the same community.
- h. **How long does it take to conduct a Doer/Non-doer/Barrier Analysis Study?** Based on experience from several NGOs that have conducted these studies, a group of about 15 – 20 interviewers can interview the 90 interviewees in a morning (slightly more than 4 interviews per person). This assumes that ways to more easily locate ‘doers’ have been identified and that the community is not more than 1- 2 hours away.
- i. **When in the project life cycle should Barrier Analysis be used?** Barrier Analysis can be used at project start-up (for example prior to detailed implementation planning) which is the ideal time to plan a behavior change strategy, or at midterm or final evaluation for a project which will have a follow-on if a BC strategy is needed or needs adjustment at that time. In addition, some organizations conduct a BA periodically in order to research many behaviors during a longer project. (For example, Food for the Hungry sometimes conducts a BA on one key behavior they intend to promote through Care Groups [e.g., exclusive breastfeeding] before each four-month behavior promotion module.)
- j. **How reliable are the findings?** Because BA identifies statistically-significant differences between Doers and Non-Doers, it is very probable that the determinants found to be different between the two groups are true differences (not just due to chance). The determinants identified have less than a 5% probability of being due to chance (i.e., $p < 0.05$).

- k. **How are results analyzed?** A questionnaire is developed and administered to Doers and Non-Doers (usually equal numbers of both). The results are tabulated manually on newsprint using a coding guide and the percentage calculated using a simple calculator. Those responses with a 15 point difference or higher indicate the most significant Determinants and Bridges to Activities. It is important to note that the percentages of Doers or percentages of Non-Doers giving a particular response alone (or even the total combined) are NOT meaningful – it’s the difference between the two groups that matters. Also, sometimes a minority of both Doers and Non-Doers will give a particular response – but the difference between them is large enough to indicate an important determinant.

The results can also be entered into an Excel spread sheet specially created for finding differences between the two groups (Doers and Non-Doers). The Excel spreadsheet calculates the percentages of Doers and Non-Doers who gave each response, and identifies differences that are statistically-significant. By using the spreadsheet, you are *more likely* to find more statistically-significant differences between Doers and Non-Doers (as compared with just looking for 15-point differences between Doers and Non-Doers). It also shows the magnitude of each determinant (e.g. “Doers were 7 times more likely to say that their husband approved of the behavior than Non-Doers.”) The Excel spreadsheet can be downloaded (as of March 2012) from:

http://www.caregroupinfo.org/BA_Tab_Table_Eng_9_30_10.xls

A document explaining how to use the BA tabulation sheet can be found here:

http://www.caregroupinfo.org/BA_Analysis_Excel_Sheet_Tab_Sheet_Explanation_Sept_2010.doc

Future updates to the BA Tabulation Table and instructions will be posted on the Food Security and Nutrition Network website (www.foodsecuritynetwork.org), and on this page:

<http://www.caregroupinfo.org/blog/narrated-presentations-on-care-groups-and-care-group-tools/planning-m-e-tools>

- l. **Are qualitative methods sometimes used after a BA study?** Yes, qualitative methods can be necessary to follow-up after a Doer/Non-doer/BA study. For example, if we learn from a question about Social Norms that women think their husbands don’t approve of family planning, then we need to do follow- up with another qualitative method, to verify if the husband actually feel this way (or if this is just a false perception) (*How* and *why* questions are often best explored using qualitative rather than quantitative methods.) Similarly, if many people answer that it's more difficult to eat protein-rich foods because of the cost, then we need to learn what the actual cost is and what they are willing to pay, what else they are spending money on that could be foregone to buy the protein-rich food, whether the Doers are more affluent, etc.

While BA should help you identify the most important barriers and enablers, it may not be enough to find what truly motivates people, including the “Big Benefits.” Therefore, it can be useful to follow-up this approach with in-depth group discussions.

- m. **Is Barrier Analysis a quantitative method, qualitative method, or both?** Barrier Analysis is both qualitative and quantitative. It has open-ended elements that help us to explore and describe how the two groups think (which makes them qualitative in nature), but it also has quantitative elements (e.g. the statistical comparison of Doers and Non-Doers) which allow us to say which differences are important. Since Barrier Analysis does not measure prevalence of a particular belief, most people do not think of it as quantitative; however, quantitative information is being collected and analyzed (e.g., which group gave a particular response more often).

ANNEX 2. DATA COLLECTORS, DATA COLLECTION TEAMS AND TEAM SUPERVISORS

Sr.	Name	Organization	Group	Task
1	Julia Weatherson	Catholic Relief Services	Zotung	Group Supervisor
2	Nay Myo Linn	Catholic Relief Services	Zotung	Data collector
3	Francis Thang Cin Lian	KMSS or Caritas Hakha	Zotung	Data collector
4	Za Peng	KMSS or Caritas Hakha	Zotung	Data collector
5	Helly	KMSS or Caritas Hakha	Zotung	Data collector
6	Nyian Ling	KMSS or Caritas Hakha	Zotung	Data collector
7	Bawi Thein San	KMSS or Caritas Hakha	Zotung	Data collector
8	Thang Za Lian	Catholic Relief Services	Luatu	Group Supervisor
9	Dominic Thlaceu	KMSS or Caritas Hakha	Luatu	Data collector
10	Exodus	KMSS or Caritas Hakha	Luatu	Data collector
11	Sang Hlei	KMSS or Caritas Hakha	Luatu	Data collector
12	Rung Thang	KMSS or Caritas Hakha	Luatu	Data collector
13	Pa Rone Lian	KMSS or Caritas Hakha	Luatu	Data collector

ANNEX 3 - DATA COLLECTION SCHEDULE, COMMUNITIES VISITED EACH DAY BY TEAMS

Date	Community or village	Group/Team
1 March 2017	Rezua A	Zongtung
2 March 2017	Calthawng B	Zongtung
2 March 2017	Hrinthang	Zongtung
3 March 2017	Sawti	Zongtung
3 March 2017	Ruava B	Zongtung
4 March 2017	Ruava A	Zongtung
6 March 2017	Hriangpi A	Zongtung
1 March 2017	Sate	Luatu
2 March 2017	Fanthen	Luatu
3 March 2017	Hnaring A	Luatu
3 March 2017	Hnaring B	Luatu
4 March 2017	Hriangpi B	Luatu
4 March 2017	Leikang	Luatu

ANNEX 4. DBC FRAMEWORKS FOR AGRICULTURE AND NUTRITION

Behavior	Priority Group or Influencing	Determinants	Bridges to Activities	Activities
Targeted maize farmers store maize seeds in hermetic (air-tight, water-proof) containers	Mother/in law, father/in law, Spouse	Self-efficacy Access Cue for Action Susceptibility Action efficacy	<ul style="list-style-type: none"> • Increase access by improving the skills to make hermetic container locally. • Increase the perception that a lot of your seeds will not be damaged if you store them in air-tight, water proof container. • Increase the perception that it is not difficult at all to remember to store on hermetic storage in one month after harvesting. • Reduce the risk of maize seeds through hermetic storage. • Increase the perception that it would be very serious if a lot of your maize seeds had pest or water damaged. • Increase the perception that hermetic storage protects maize seed from damage by pest or diseases 	<ul style="list-style-type: none"> • Seeds and Grain hermetically storage demonstration learning session • Harvesting and preparation for hermetically storage demonstration learning activity • Development of IEC materials
Targeted farmers plant a leguminous crop in the same field as their staple crop during the same season	Mother, father, Spouse	Self-efficacy Access Positive consequences Negative consequences Action efficacy	<ul style="list-style-type: none"> • Increase the perception that pulses can grow in the same plot of maize • Increase the perception that pulses seeds are available in the local/communities. • Increase the perception that intercropping pulses with maize can increase yield therefore increase income and nutrition security. • Increase the perception that intercropping can save time, labor, as well as areas of plot. • Decrease the perception that intercropping pulses with maize do not create for rats and bird to eat maize. • Decrease the perception that rats and pests can damage intercropping pulses and maize • Increase the knowledge of farmer to control pests and rats by using locally available material and method. • Reduce the perception that intercropping pulses with maize do not lead to damage. 	<ul style="list-style-type: none"> • Seeds and Grain hermetically storage demonstration learning session • Harvesting and preparation for hermetically storage demonstration learning activity • Demonstration learning Session on quality seeds, spacing, intercropping, ash or fertilizer usage, soil management • Demonstration learning Session on integrated pest management including rat control • Development IEC materials

Behavior	Priority Group or Influencing	Determinants	Bridges to Activities	Activities
Mothers of children 6-23 months feed children two different colorful fruit/vegetable each day	Mothers with children 6-23 months	Self-efficacy Access Positive Consequences Susceptibility Severity Action-efficacy	<ul style="list-style-type: none"> • Increase ability to grow nutritious vegetables • Increase perception that people can grow nutritious vegetable in their home garden with little money • Increase ability to access at least two nutritious vegetable and fruit year-round • Increase the skill to prepare balanced diet with locally available foods • Increase perception that feeding baby 2+ colorful fruit and veg helps baby grow healthy and strong • Increase perception that malnutrition is likely for baby not eating 2+ fruit/veg each day • Increase perception that malnutrition for children under two years old is severe/serious • Increase perception when you feed your child 6-23 months at least two types of colorful fruits and vegetable each day it protects against malnutrition 	<ul style="list-style-type: none"> • Conduct home garden demonstrations with PLWs using low-tech and water efficient techniques • Conduct cooking clubs with LMs and NWs to demonstrate and try new recipes that are nutrient dense using locally available foods • Conduct KMG meetings and home visits to share the benefits of diverse diets for baby • Hold community wide events to sensitize and raise support for diet diversity for mom and baby • Include problem identify and discussions in monthly lessons activities to raise awareness and local understanding of malnutrition as it impacts Chin • Include in monthly lessons activities to raise awareness and local understanding of malnutrition as it impacts Chin • Include in KMG lessons and activities the effectiveness of diet diversity among children 6-23 months from neighboring countries.
Lactating women eat two extra bowls each day	Women who are breastfeeding their children Influencing group: Husband	Self-efficacy Access Social Norm	<ul style="list-style-type: none"> • Increase perception that breastfeeding increases hunger and improve EBF and continued BF • Increase skills to prepare meals mothers would enjoy eating using nutritious locally available ingredients • Reduce the perception that meat is only good food/meal • Increase ability to remember to eat two extra bowls each day while breastfeeding • Increase access of staple and nutritious crops year-round • Increase perception of husband to support lactating wife to eat two extra bowls 	<ul style="list-style-type: none"> • Promote continued breastfeeding during IYCF in KMGs and home visits • Conduct cooking clubs with PLWs to demonstrate and taste different nutrient dense recipes using locally and seasonally available foods, especially recipes that • Develop reminder recipes wheels with diet diversity recommendations for mom and baby at different stages of the 1000 days. • Conduct and support home garden demonstrations with PLWs that utilize water efficient techniques that allow dry season production • Invite husbands to KMG meetings, once every 6 months • Conduct community wide events to promote ENA with husbands • Include husbands in home visits • LMs conducts a meeting with husbands and moms to promote monthly message

Barrier Analysis Questionnaire :
Complementary Feeding/Food Variety
for use with Mothers of Children 6 – 23 months

Behavior Statement

Mothers of children 6-23 months feed 2 different types of colorful vegetables and fruits at each meal

Demographic Data

Date: ____/____/____

Interviewer's Name: _____

Questionnaire No.: ____

Scripted Introduction:

Niemah tluo ma? Kamah I ming ca: haatiyta sapi tiypi napa hne a se pata biekhierhiy nalie ta ate rapa pakha ta i cuo. Biekhierhiy napa i ma pathu hluo hing ca suokhah cyakhierhiy thiy ang se lah, nasaa ta asyice pahing kungkhazaa ma a ta. (*Haatiyta a kung ca i ma khing pa kung acuo li kie ca, (khiehriynapa 1 kha mang riyipa), alawna bie hluo la a hrangpa nung pakha huv pakha riyipa a cuo'a*). Ata biekhierhiy napa lie hing, haatiyta sapi tiypi nazya hne a se pata ahrue pakhaw napa cuo'a ta, minnih 15 – 20 tana acuo maru'a. Mahne a se pahing ta namah na hmung nazya i ca pachang khing. Suokhat a aw paca, mah biekhierhiy napa lie hing naate nathue hingta, naate li zaw ta, pyanapa haapa, ma capi khupa aw'a vyi. Mataa cata, malie hing ta nari pa meikaa zaw hing, malie luo mari le pa aw vyi. Makie ca, mah biekhierhiy napa lie hing, malie naate pakhu tiy'a ma? [Ate khuli biephung pakie ca, alawna bie chang siy riy'a pa]

Hi, my name is _____; and I am part of a study team looking into child feeding practices. Before I continue I would like to know the age of your youngest child. (If the child is not in the desired age range (see question 1), thank the mother and look for another respondent.) The study includes a discussion of feeding practices and will take about 15 - 20 minutes. I would like to hear your views on this topic. You are not obligated to participate in the study and no services will be withheld if you decide not to. Also, if you decide to participate you will not receive any compensation, gifts or services. Everything we discuss will be held in strict confidence and will not be shared with anyone else. Would you like to participate in the study? [If not, thank them for their time.]

Section A - Doer/Non-doer Screening Questions

1. Nasaata asyicepa hing kungkhazaa ma ata? ____ (← Athla ta cape riyipa)

How old is your youngest child? _____ (← write the age in months here)

- a. 6 months - 23 months
- b. 6 months or younger → *End interview and look for another mother*
- c. Older than 23 months → *End interview and look for another mother*
- d. Don't Know / Won't say → *End interview and look for another mother*

2. Achuocietlipa ninghning chunglie ta, nasaa taping khaapa SA ma na pi? Meme na pazawsa pa kha rili pata, SA luokhah ma na pi?

I would like to you think about all the meals you fed your baby in the last 2 days. How many meals did you feed your baby something other than breast milk? (This question is just to help the mother to remember what the baby ate.)

a. _____

b. Do not know / no response → *End interview and look for another respondent*

3. Achuocietli pa ninghning chunglie kha ta, khaapa uohnaasiyhnaa hne tyityi-uosah pa zaw ma nasaa ta na pi?

Please tell me all the different vegetables and fruits you remember feeding to your baby in the last two days. (If the mother mentions a dish that has several ingredients, ask her to list them all. Check all the boxes of the mother mentions.)

a. Do not know / no response → *End interview and look for another respondent*

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ b. Amaranth ▪ c. Cassava, Kale ▪ d. "Chin" Kale ▪ e. Spinach ▪ f. Broccoli ▪ g. Mustard leave ▪ h. Roselle ▪ i. Pennywort ▪ j. Moringa ▪ k. Morning Glory | <ul style="list-style-type: none"> ▪ l. Pumpkin ▪ m. Carrot ▪ n. Sweet potatoes (orange inside) ▪ o. Red sweet pepper ▪ p. Mango ▪ q. Papaya ▪ r. Peach/Apricot ▪ s. Passion fruit ▪ t. Tree Tomato (Tamarillo) |
|--|--|

DOER /NON-DOER CLASSIFICATION TABLE

DOER (all of the following)	Non-Doer (any ONE of the following)	Do Not Interview (any ONE of the following)
Question 1 = A		Question 1 = B or C or D
Question 3 = two or more boxes checked from B through H	Question 3 = one or less boxes checked from B through H	Question 3 = A

Group: Doer Non-doer

Behavior Explanation

(Show the mother the photo/picture of the colorful vegetables and fruits; place it where she can see it during the entire interview. Briefly explain the picture and make sure she understands the idea of grouping different. She doesn't need to know the names of the groups or their nutritional value, but she does need to recognize the picture.)

In the following questions I am going to be talking about different colorful vegetables and fruits. When I mention the "colorful vegetables and fruits," I am talking about in these photos [Point to the picture of the different colorful vegetables and fruits and keep the picture in view throughout the interview.

Section B – Research Questions

(Perceived Positive Consequences)

1a. Doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung pi pa **athlahnenapa** hing khaapa zaw ma?

*What are the **advantages** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

1b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung pi pa **athlahnenapa** hing khaapa zaw ma acuo thluo'a mang nata ma?
*What would be the **advantages** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "What else?"]

(Perceived Negative Consequences)

2a. Doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosahpa phangthung pipa **achienapa** hing khaapa zaw ma?

*What are the **disadvantages** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

2b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung pipa **achienapa** hing khaapa zaw ma acuo thluo'a mang nata ma?

*What would be the **disadvantages** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "What else?"]

(Perceived Self-efficacy)

3a. Doers: Nasaa ta hing, luokhah SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu pahing khaapa nakaw ma?

*What makes it **easy** for you to feed your baby 2 different types of colorful vegetables and fruits at each meal?*

3b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta khaapa ma a hyi?

*What would make it **easy** for you to feed your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "What else?"]

(Perceived Self-efficacy)

4a. Doers: Nasaa ta hing, luokhah SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, khaa nakhaw ma a ruv?

*What makes it **difficult** for you to feed your baby 2 different types of colorful vegetables and fruits at each meal?*

4b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, khaa nakhaw na a ruv thluo'a mang na ta?

*What would make it **difficult** for you to feed your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "What else?"]

(Perceived Social Norms)

5a. Doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, ahung ma naa caathla khyi?

*Who are the people that **approve** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

5b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, ahung ma naa caathla khyikhu'a?

*Who are the people that **would approve** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "Who else?"]

(Perceived Social Norms)

6a. Doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, ahung ma naa caathla khyili pata a aw?

*Who are the people that **disapprove** of you feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

6b. Non-doers: Nasaa ta hing, luokhah SA napi tiy hing ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung napi khu riy'a pahing ta, ahung ma naa caathla khyili pata a aw'a?

*Who are the people that **would disapprove** of you feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

[Write all responses below. Probe with "Who else?"]

(Perceived Access)

7a. Doers: A lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung ci hmungkhu riypa hing khatluv tama a ruv? Namah cuota a ruv sah nata ma, a chaw ta a ruv nata ma, acuoliekie ca ruv vyih nata ma?

*How **difficult** is it to get 2 different types of colorful vegetables and fruits? Would you say it is Very difficult, somewhat difficult or not difficult at all?*

7b. Non-doers: A lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung ci hmungkhu riypa hing khatluv tama a ruv thluo'a mang nata? Namah cuota a ruv sah nata ma, a chaw ta a ruv nata ma, acuoliekie ca ruv vyih nata ma?

*How **difficult** would it be to get 2 different types of colorful vegetables and fruits? Would you say it is Very difficult, somewhat difficult or not difficult at all?*

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all

(Perceived Cues for Action / Reminders)

8a. Doers: Nasaa ta cuota SA na chang ning ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung ci pate riy'a pa hing khatluv tama a thyi a ruv? A chaw ta a ruv nata ma, acuoliekie ca ruv vyih nata ma?

*When you prepare meals for your baby, how **difficult** is it to remember to include 2 different types of colorful vegetables and fruits? Very difficult, somewhat difficult, or not difficult at all?*

8b. Non-doers: Nasaa ta cuota SA na chang ning ta, a lulipa uohnaasiyhnaa hne tyityi-uosah pa phangthung ci pate riy'a pa hing khatluv tama a thyi a ruv thluo'a mang nata? A ruv sah nata ma, a chaw ta a ruv nata ma, acuoliekie ca ruv vyih nata ma?

*When you prepare meals for your baby, how **difficult** do you think it would be to remember to include 2 different types of colorful vegetables and fruits? Very difficult, somewhat difficult, or not difficult at all?*

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all
- d. Don't know / Won't say

(Perceived Susceptibility / Perceived Risk)

9. Doers and Non-doers: A vaw riypa kung lie hing ta, nasaa ta hing Ahaaraah tlingli pata a aw thluo'a mang nata ma? A cuo karie'a nata ma, a cuo thluo'a mang nata ma, a cuoliekie ca cuo thluo'a mang vyih nata ma?

*How **likely** is it that your child will become malnourished in the coming year? Very likely, somewhat likely, or not likely at all?*

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perceived Severity)

10. Doers and Non-doers: Nasaa ta hing Ahaaraah tlingli pata aw seh la, katluv na a ruv thluo'a mang nata ma? A ruv seh'a nata ma, a ruv puo thluo'a mang nata ma, a cuoliekie ca ruv'a vyi nata ma?

*How **serious** would it be if your baby became malnourished? A very serious problem, somewhat serious problem, or not serious at all?*

- a. Very serious problem
- b. Somewhat serious problem
- c. Not serious at all

(Action Efficacy)

11. Doers and Non-doers: Nasaa tahing luokha SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah phangthung napi thue hingta, ahaaraah tlingli pata a aw thluo'a mang nata ma? I ta kare, a cuo khu, vie cuo'a vyi?

*How **likely** is it that your baby would become malnourished if you feed him/her 2 different types of colorful vegetables and fruits each meal? Very likely, somewhat likely, not very likely?*

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perception of Divine Will)

12a. Doers: Nasaa tahing luokha SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah phangthung pi riy'a pa hingta, Khazing pa ta a khingkhyi pa a cuo nata ma?

*Do you think that **God approves** of you feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

12b. Non-doers: Nasaa tahing luokha SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah phangthung pi riy'a pa hingta, Khazing pa ta a khingkhyi pa a cuo thluo'a mang nata ma?

*Do you think that **God would approve** of feeding your baby 2 different types of colorful vegetables and fruits at each meal?*

- a. Yes
- b. No
- c. Don't Know

(Culture)

13. Doers and Non-doers: Nasaa tahing luokha SA napi tiy hingta, a lulipa uohnaasiyhnaa hne tyityi-uosah phangthung pi riy'a pa hing, ma thuki napa zaw hne ta akelina pa a aw ma?

Are there any cultural rules or taboos that you know of against feeding your baby 2 different types of colorful vegetables and fruits at each meal?

- a. Yes
- b. No
- c. Don't know

Atahing ca, ahaaraah hne ta a selipa bie cakhie hriy se'ang la;

Now I'm going to ask you a question unrelated to nutrition.

(Universal Motivator)

14. Doers and Non-doers: Hring zung cuo lie hing, nakhingcepa **suokha** ri pachiy?

*What is the **one thing** that you desire most in life?*

[Write all responses below.]

THANK THE RESPONDENT FOR HIS OR HER TIME!

**BARRIER ANALYSIS QUESTIONNAIRE:
Eating two EXTRA bowls each day while lactating**

Behavior Statement

Lactating mothers eat two extra bowls each day.

Interviewer's Name: _____

Questionnaire No.: _____

Date: ___/___/___

Community: _____

Scripted Introduction

Niemah tluo ma? Kamah i ming ca _____ na cuo ang te, niemah khy lieta meme a pazaw sa nguoluo pa nungnung patie hing, amah hnaa atluo riy'a pata tuokhaatama a aw, a mangsang nazya hne a seh pata biekhiehrie napa lie a te rapa ta i cuo. Mahne a sepa hing ta, namah na hmung nazya, na rue nazya kha macah pachang khing. Mah lie hing naripa mekaa zaw hing a hung lu hmuo ri pachaa riy pa cuo vyi. Suokhah a aw paca, mah biekhiehyi napa lie naate nakaw ta zaw kiemah taata, abyanapa cuoseh lasaw haapaapa zaw ma capi pa aw'a vyi. Bie i cakhiehyi riy'a pa zaw hing minih 15 tana ma riy'a. Ate riy'a patah na palung atling thluo cu va ma? [A tekhingli kie ca, alawnabie hlou siy la cakuo se thluo.]

Hi. My name is _____ and I am part of a study team seeking to better understand what lactating women do to stay healthy. We are interested in your views on this topic. If you decide to participate, your responses will be kept confidential and not shared with anyone. You are not obligated in any way to participate in the study. You won't receive any gift or remuneration should you participate, and no services will be withheld if you decide not to. The interview will only take 15 minutes of your time. Would you like to participate? [If declined, thank the woman for her time.]

Section A. Doer/Non-doer Screening Questions

- Atahing, meme a pazaw nguoluo kalie pa haatiyta a ma aw ma?
Are you currently breastfeeding a child?
 A. Yes
 B. No → *End interview and look for another mother*
- Zuochaning, azuohnie naning pa mekaa a viethyi pakhaa la, zuochaning lu khazaa ma SA naning?
I would like you to think about the bowls you ate yesterday: How many times did you eat a bowl yesterday during the day and night? (This question is just to help the mother answer the following question.)
 _____ times.
- Atahing, nu naphya hlou kha vierue pakhaa la, atahing naningpa hne nu naphya hlou ta naningpa SA a lu athlenapa a aw ma?
Now, thinking back to the time before you were pregnant, has the number of bowls you eat per day changed in comparison to before you were pregnant?
 A. Yes → *Proceed to question #4*
 B. No → *Mark as Non-doer below, and continue to Section B.*
 C. can't recall/won't say → *End interview and look for another mother*

4. Athlenapa a aw kie ca, a luohluv vie tama naning, a luo alupa tama, acuoliekca nu naphyali ning laata a luo a caw vie tama naning?
If yes, what has changed? Would you say you are eating more bowls per day, the same number of bowls per day, or fewer bowls per day than before you got pregnant?
- A. more bowls per day
 B. same number of bowls per day or fewer bowls per day
 C. Can't say/refuses to respond → *End interview and look for another mother*

Doer (all of the following)	Non-Doer (any one of the following)	Do not Interview (any one of the following)
Question 1 = A		Question 1 = B
Question 3 = A	Question 3 = B	Question 3 = C
Question 4 = A	Question 4 = B	Question 4 = C

GROUP: Doer Non-Doer

Behavior Explanation:

Atahing ca, ningkha ta kaahning ahluv vie ta SA ning nakaw hne a se pata, a chawta bie i cakiehriy'a ing. Kaahning tapa ca pathiy kaakha, acoulikieca muomuo kaakhah kha i rikhing napa ta a cuo.

I am going to ask you some questions about eating two extra bowls each day. When we talk about these two extra bowls I mean a cooked meal that includes [mention local staple food].

Section B – Research Questions

(Perceived Self Efficacy / Skills)

5. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha chung naningtaw palaata khaapahing ma anasa pata kaahning ahluv vieta caa paning sakhu?
*What makes it **easy** for you to eat two extra bowls each day while you are breastfeeding?*
Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha chung naningtaw palaata khaapahing ma anasa pata kaahning ahluv vieta caa paning sakhu'a?
*What would make it **easy** for you to eat two extra bowls each day while you are breastfeeding?*
[Write all responses below. Probe with "What else?"]

(Perceived Self Efficacy / Skills)

6. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha chung naningtaw palaata kaahning ahluv vieta ningkhu riy'a pahing ta, khaapa ma caaparuv sa ce?
*What makes it **difficult** for you to eat two extra bowls each day while you are breastfeeding?*
Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha chung naningtaw palaata kaahning ahluv vieta ningkhu riy'a pahing ta, khaapa hing ma caaparuv sace thluo'a mang nata?
*What would make it **difficult** for you to eat two extra bowls each day while you are breastfeeding?*
[Write all responses below. Probe with "What else?"]

(Perceived Positive Consequences)

7. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning pahing, khaapa ma **athlehenapa** a aw?
*What are the **advantages** of eating two extra bowls each day while you are breastfeeding?*
Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning kie ca, khaapa ma **athlehenapa** a aw thluo'a mang nata?
*What would be the **advantages** of eating two extra bowls each day while you are breastfeeding?*
[Write all responses below. Probe with "What else?"]

(Perceived Negative Consequences)

8. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning pahing, khaapa ma athlehnelinapa a aw?

What disadvantages of eating two extra bowls each day while you are breastfeeding?

Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning kie ca, khaapa ma athlehnelinapa a aw thluo mang nata?

What would be the disadvantages of eating two extra bowls each day while you are breastfeeding?

[Write all responses below. Probe with "What else?"]

(Social Norms)

9. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning pahing, a hung zaw naa caatla khyi yi?

*Who are the people that **approve** of you eating two extra bowls each day while you are breastfeeding?*

Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta ning riy'a pata, a hung zaw yi'ma naa caatla khyi yi?

*Who are the people that **would approve** of you eating two extra bowls each day while you are breastfeeding?*

[Write all responses below. Probe with "Who else?"]

(Social Norms)

10. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning pahing, a hung zaw yi'ma naa caatla khyi va'yi?

*Who are the people that **disapprove** of you eating two extra bowls each day while you are breastfeeding?*

Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning pahing, a hung zaw yi'ma naa caatla khyi'a va'yi?

*Who are the people that **would disapprove** of you eating two extra bowls each day while you are breastfeeding?*

[Write all responses below. Probe with "Whoelse?"]

(Perceived Access)

11. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning khu riy'a pahing ta, naahupa chechiytibang hmungkhu riy'a pahing ta, khathluv ma a ruv? Ruv vyih nata ma, acawta a ruv nata ma, acuoliekca a ruvsah nata ma?

How difficult is it for you to get the things you need to eat two extra bowls each day while you are breastfeeding?

Not difficult at all, somewhat difficult, or very difficult?

Non Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta naning khu riy'a pahing ta, naahupa chechiytibang hmungkhu riy'a pahing ta, khathluv ma a ruv thluo'a mang nata? Ruv vyih nata ma, acawta a ruv nata ma, acuoliekca a ruvsah nata ma?

How difficult would it be for you to get the things you need to eat two extra bowls each day while you are breastfeeding? Not difficult at all, somewhat difficult, or very difficult?

- A. Not difficult at all
- B. Somewhat difficult
- C. Very difficult

(Perceived Cues for Action)

12. **Doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta i ning'a ta pahing athyi pari riy'a pahing, khathluv ma a ruv?

How difficult is it to remember to eat two extra bowls each day while you are breastfeeding?

Non-Doers: Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta i ning'a ta pahing athyi pari riy'a pahing, khathluv ma a ruv thluo'a mang nata?

How difficult do you think it would be to remember to eat two extra bowls each day while you are breastfeeding?

- A. Very difficult
- B. Somewhat difficult
- C. Not difficult at all

(Divine Will)

13. **Doers and Non-doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta ning riy'a pahing, Khazing ta i naakhingkhyi nata ma?
Do you think God wants you to eat two extra bowls each day while you are breastfeeding?
- A. Yes
 - B. Maybe
 - C. No

(Culture)

14. **Doers and Non-doers:** Meme na pazaw sa nguoluo ningta, ningkha ta kaahning ahluv vieta ning pahing, niemah **thukinapa** zaw hne a kelipa a aw ma?
*Are there any **cultural rules or taboos** that you know of against eating two extra bowls each day while you are breastfeeding?*
- a. Yes
 - b. Maybe
 - c. No

(Perceived Susceptibility / Perceived Risk)

15. **Doers & Non-Doers:** Na memetiy hing a viecaw thluo'a mang nata ma?
How likely is it that you won't be able to produce enough milk for your baby?
- A. Very likely
 - B. Somewhat likely
 - C. Not likely at all

(Perceived Severity)

16. **Doers & Non Doers:** Na memetiy hing a viecaw kie ca, khatluy ma a ruvthluo'a mang nata?
How bad of a problem would it be if you weren't able to produce enough milk for your baby?
- A. Very bad
 - B. Somewhat bad
 - C. Not a bad problem at all

(Perceived Action Efficacy)

17. **Doers & Non Doers:** Meme na pazawsa nguoluo ningta, ningkha ta **SA kaahning** ahluv vieta naning nathue hingta, na memetiy arung vie thluo'a mang nata ma?
Do you think that eating two extra bowls each day while you are breastfeeding will help you to have enough milk for your baby?
- A. Yes
 - B. Maybe
 - C. No

(Universal Motivator)

18. Hringzung cuo lie ta, nakhingcepa **suokha** ri pachiy.
*What is the **one thing** that you desire most in life?*

[Write all responses below. Probe with "What else?"]

THANK THE RESPONDENT FOR HER TIME

**Barrier Analysis Questionnaire:
Storing Seeds for use with maize farmers**

Behavior Statement
Targeted maize farmers store maize seeds in hermetic (air-tight, water-proof) containers.

Demographic Data

Interviewer's Name: _____ Questionnaire No.: _____ Date: ____/____/____

Community: _____

Scripted Introduction:

မဂ်လာပါ။ ကြံ့နဲတော့/မ နာမညော့တ့ _____ ဖျစွါတယု။ ဝေပျဟာငးဖူးမိးဝီစ့ ထိနးသိမးတးဝ့ဝ့ ပတ္တကွပီး ဝေလ့လာတဲအဖြူက အဖြူဝတ္တဝေယာကွါ။ ဝေခွေးဝေးငြေးဖို့ အနိ မိနု ၂ဝခန့် ဟကာပါမယု။ ခဏ်း/ရွဲငဲ့ရဲအေတြူ အဟကီးဝ့ဝ့ သေဘာထားဝေတြကို ဝေပျဟာပေစခိတယု။ မျဖစု မေန ပါဝင့ပေဟကားရမယွါ မဆိုလိုပါဘူး။ မေပျဟကားခိရဲခိ စီမိကိနးဝနဲဆာငးဝေတြ ဆုံး ရးဝံး/တားဆီးမးဝေတြ မျဖစုစေရပါဘူး။ ပါဝင့ပေဟကားပျခငးအတြက လက့ဆာငးဝ့ဝ့ အျားပစာညးဝေတြ ဝေပးမာမဟုတဲါဘူး။ အခုခွေးဝေးငြေးမညးအဟကာငးအရာဝေတြကိုလိညး လွဲဝွက္ကားမာ ဖျစွါတယု။ ပါဝင့ပေဟကားဝေခွေးဝေးငြေးဖို့ သေဘာတူပါသလား။ (သေဘာမတူပါက ငးငး၏အနိဝေမးအတြက ဝေကးဇူးတင့ဟကာငးဝေပျဟပါ)

Hi, my name is _____; and I am part of a study team looking understand things farmers do to increase maize yields. The study includes a discussion of this issue and will take about 20 minutes. I would like to hear your experience and thoughts on this topic. You are not obligated to participate in the study and no services will be withheld if you decide not to participate. Likewise, if you chose to be interviewed you will not receive any gifts, special services, or remuneration. Everything we discuss will be held in strict confidence and will not be shared with anyone else.

Would you like to participate in the study? [If not, thank them for their time.]

Section A - Doer/Non-doer Screening Questions

1. ပျီးခဲဲတဲးဝ့ဝ့ ဝေပျဟာငးဖူးစိုက္ကား။

Last year, did you grow maize?

- a. Yes → Go to next question
- b. No → End interview and look for another respondent
- c. Don't Know / Won't say → End interview and look for another respondent

2. ပျီးခဲဲတဲးဝ့ဝ့ ဝေပျဟာငးဖူးမိးဝီစ့ဝေတြ ဒီးဝ့စ့စိုကိုဖြူ သိမးထားတာရွိလား။

Did you store any of the seeds that you grew last year for planting this year?

- a. Yes → Continue to next question.
- b. No → Mark as Non-doer
- c. Don't Know / Won't say → End interview and look for another respondent

3. ဘယုခေရာမာထားလဲ။ ဟကာညးလိုရမလား။

May I see where you store your maize seeds?

- a. At least some of the maize is stored in a tightly covered container/bag → Continue to next question
- b. None of maize seed are stored in tightly covered container/bag → Mark as Non-doer and continue to Section B
- c. Don't Know / Won't say → End interview and look for another respondent

DOER /NON-DOER CLASSIFICATION TABLE

DOER (all of the following)	Non-Doer (any ONE of the following)	Do Not Interview (any ONE of the following)
Question 1 = a		Question 1 = b or c
Question 2 = a	Question 2 = b	Question 2 = c
Question 3 = a	Question 3 = b	Question 3 = c

Group: Doer Non-doer

Section B - Research Questions

Behavior Explanation
 ဟာမိသစွဲဒီစွဲသိမူးထားတာဒီစွဲပတ္တကူပီး မေးခြန်းဝေတြေးပါမယု။ ဟာမိသစွဲဒီစွဲ ဆိုတာ
 ဝေပုဟဒူးဖူးမီးဝေတြေးကို ဝေလဒူးဝေရအားဝေရယေကနလံုခိတွဲဝေရပုဖွဲပုံး ဒါမဟုတု အုခား
 နညူးလမူး/အရားဒူးလုဟူးတွဲ မီးဝေသိုလောဒူးဝိဝေပုစာညူးဝေတြေး ဝေလလံုအာထူးတာကို ဆိုဝိလို့မာ
 ပုဖွဲတယု။

In the following questions I am going to be talking about hermetic storing seeds. Hermetic storing seeds mean maize seeds are storing in an air-tight, water-proof containers.

(Perceived Self-efficacy)

- 1a. Doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားဒီဝိဝေပု ဘာဝေတြေး လုယူဝေစဲခဲသလဲ။
 What makes it **easier** for you to store your maize seeds in air-tight, water-proof containers?
- 1b. Non-doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားလားဒီဝိဝေပု ဘာဝေတြေး လုယူဝေစဲမာလဲ။
 What would make it **easier** for you to store your maize seeds in air-tight, water-proof containers?
(Write all responses below. Probe with “What else?”)

(Perceived Self Efficacy / Skills)

- 2a. Doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားဒီဝိဝေပု ဘာဝေတြေး ခက္ခဲဝေစဲသလဲ။
 What makes it **difficult** for you to store your maize seeds in air-tight, water-proof containers?
- 2b. Non-doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားလားဒီဝိဝေပု ဘာဝေတြေး ခက္ခဲဝေစဲမာလဲ။
 What would make it **difficult** for you to store your maize seeds in air-tight, water-proof containers?
(Write all responses below. Probe with “What else?”)

(Perceived Positive Consequences)

- 3a. Doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားဒီဝိဝေပု ဘာဝေကားတွဲအခ်ကု/အားသာခ်ကုဝေတြေးခဲလဲ။
 What are the **advantages** of storing your maize seeds in air-tight, water-proof containers?
- 3b. Non-doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားလားဒီဝိဝေပု ဘာဝေကားတွဲ အခ်ကု/အားသာခ်ကုဝေတြေး မာလဲ။
 What would be the **advantages** of storing your maize seeds in air-tight, water-proof containers?
(Write all responses below. Probe with “What else?”)

(Perceived Negative Consequences)

- 4a. Doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားဒီဝိဝေပု ဘာအားနညူးခ်ကု/ကေကားတွဲအခ်ကုဝေတြေးခဲလဲ။
 What are the **disadvantages** of storing your maize seeds in air-tight, water-proof containers?
- 4b. Non-doers:** ဟာမိသစွဲဒီစွဲ သိမူးထားလားဒီဝိဝေပု ဘာအားနညူးခ်ကုဝေတြေး မာလဲ။
 What would be the **disadvantages** of storing your maize seeds in air-tight, water-proof containers?
(Write all responses below. Probe with “What else?”)

(Perceived Social Norms)

5a. **Doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားနိဗ္ဗိတ ဘယျူဝေတြရဲၣ် အားဝေးလကွံအတညျူပီမးလိုသလဲ။

Who are the people that **approve** of you storing your maize seeds in air-tight, water-proof containers?

5b. **Non-doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားလာနိဗ္ဗိတ ဘယျူဝေတြရဲၣ် အားဝေးလကွံအတညျူပီမး လိုမလဲ။

Who are the people that **would approve** of you storing your maize seeds in air-tight, water-proof containers?
(Write all responses below. Probe with "Who else?")

(Perceived Social Norms)

6a. **Doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားဖိုၣ် ဘယျူဝေတြက ကနုၣ်ကြကွဲလဲ။

Who are the people that **disapprove** of you storing your maize seeds in air-tight, water-proof containers?

6b. **Non-doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားဖိုၣ် ဘယျူဝေတြက ကနုၣ်ကြကွဲလဲ။

Who are the people that **would disapprove** of you storing your maize seeds in air-tight, water proof containers?
(Write all responses below. Probe with "Who else?")

(Perceived Access)

7a. **Doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားချခင်း ချီလုပုဂ္ဂိုလ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲသလဲ။

How difficult is it to make air-tight, water-proof containers to store your seeds?

7b. **Non-doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားရနုၣ် ချီလုပုဂ္ဂိုလ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲလဲ။

How difficult would it be to make air-tight, water-proof containers to store your seeds?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Cues for Action / Reminders)

8a. **Doers:** ဝေၣ်ဟုၣ်ဖူးရိတ္တိမှားစပီး တစ္ဆအတြင်း ဟာမိသစ်ဦးစီးစု သိမှားထားဖိုၣ် သတိရူပီလုပုနုၣ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲသလဲ။

How difficult is it to remember to store your maize seeds in air-tight, water-proof containers within one month after harvest? Very difficult, somewhat difficult, or not difficult at all?

8b. **Non-doers:** ဝေၣ်ဟုၣ်ဖူးရိတ္တိမှားစပီး တစ္ဆအတြင်း ဟာမိသစ်ဦးစီးစု သိမှားထားဖိုၣ် သတိရူပီ လုပုနုၣ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲလဲ။

How difficult would it be to remember to store your maize seeds in air-tight, water-proof containers one month after harvest? Very difficult, somewhat difficult, or not difficult at all?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Susceptibility / Perceived Risk)

9. **Doers and Non-doers:** မိဦးစီးစုဝေတြအမ်းဟုၣ်ကီး ပိုးမိး ဒါမွမဟုၣ် ဝေၣ်ဟုၣ်ကီး ပိုးမိး ချီလုပုဂ္ဂိုလ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲလဲ။

How likely is it that a lot of the maize seeds you stored will be damaged by pests or water?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perceived Severity)

10. **Doers and Non-doers:** မိဦးစီးစုဝေတြအမ်းဟုၣ်ကီး ပိုးမိး ဒါမွမဟုၣ် ဝေၣ်ဟုၣ်ကီး ပိုးမိး သိသိသာသာ ပိုးမိး ချီလုပုဂ္ဂိုလ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲလဲ။

How serious would it be if a lot of your maize seeds had pest or water damage? Very serious, somewhat serious, or not serious at all?

- a. Very serious
- b. Somewhat serious
- c. Not serious at all

(Action Efficacy)

11. **Doers and Non-doers:** ဟာမိသစ်ဦးစီးစု သိမှားထားချခင်း ကိုချီလုပုဂ္ဂိုလ် ဘယျူဝေတြအခွဲခွဲဝေတြခွဲခွဲလဲ။

How likely is it that a lot of your seeds will be damaged if you store them in air-tight, water-proof containers? Very likely, somewhat likely or not likely at all?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Divine Will)

12. Doers and Non-doers: ဘုရားသခင် ဒါမွမဟုတ် မေကာင်းဆိုးဝါးဘုရားက ဝေပျာင်းဖူးအကြံက နဲတယွှိဉ် ထင်ပါသလား။

Do you think that God or evil spirits cause poor harvest?

- a. Yes
- b. Maybe
- c. No

(Culture)

13. Doers and Non-doers: ဟာမီသမ္ဗိဒီစုံ သိမ္ဗးထားချခင်းဝံ့ဝံ့ပတ္တကွပီး ယဉ်ကမ်းမ; ဒါမွမဟုတ် ထုံးတမ်းအစဉ်လာဝံ့ဝံ့ ဆန့်ကျင်ငွေတြမကိုက္ခိမ; ရှိပါသလား။

Are there any cultural rules or taboos against storing your maize seeds in air tight, water-proof containers?

- a. Yes
- b. Maybe
- c. No

ဝေဆွေးဝေဝံ့ဝံ့ဝံ့ခဲတဲ့အဘုရားအရာနဲ့ မဆက္ကပွဲဝေမခြန့်းတစ္ဆေကို အခုဝေမပါမယု။

Now I am going to ask you a question totally unrelated to the topic we've been discussing.

(Question on Universal Motivators)

14. Doers and Non-doers: သင့်ဘဝမှာ အလိုဆုံးအရှိဆုံးတစ္ဆေကို ဝေပျာချပါ။

What is the one thing you desire most in life?

THANK THE RESPONDENT FOR HIS OR HER TIME!

**Barrier Analysis Questionnaire:
Maize farmer intercropping with pulses**

Behavior Statement
Targeted farmers plant a leguminous crop (e.g. groundnuts, pigeon peas, cowpeas, green beans, soy beans or lentils, etc.) in the same field as their staple crop during the same season.

Demographic Data

Interviewer's Name: _____ Questionnaire No.: _____ Date: ____/____/____

Community: _____

Scripted Introduction:
မင်္ဂလာပါ။ ကြံ့နံ့ထောင့်/မ နာမညွှတ် _____ ဖြစ်ပါသည်။ ဝေပျာင်းပွင့် ပဲအမ်းမိဇီဝ
ဝေရာစိုက်ပျိုးပွင့် ပတ္တကပ္ပိး ဝေလှံလာတဲ့အဖြူက အဖြူဝေပွင့်ဝေယာကွါ။ ဝေခြးဝေခြးဖို အခံနီနီ ၂၀ခန့်
ဗုကာပါမယ့်။ ခင်း/ရွှေရဲအေတြအဗုကီးပွင့် သေဘာထားဝေတြကို ဝေပျာပေစင် ပါတယ့်။ မျဖစွေန
ပါဝင်ပျဗုကားရမယ့် မဆိုလိုပါဘူး။ မေပျဗုကားခင်းဆိုရင် စီမံနိုး ဝနောဝေဝေတြ
ဆိုးရိုး/တားဆီးမေတြ မျဖစွေစေပါဘူး။ ပါဝင်ပျဗုကားပျဗုအေတြက လကောဝေပွင့်
အျားပစာညွှတ်ဝေတြ ဝေပေးမဟုတ်ပါဘူး။ အခုဝေခြးဝေခြးမညွှတ်အေဗုကားအေရာဝေတြကိုလညွှတ် လွှဲပွင့်
ထားမှာ ဖြစ်ပါသည်။ ပါဝင်ပျဗုကားဝေခြးဝေခြးဖို သေဘာတူပါသလား။ (သေဘာမတူပါက ငှင်း၏
အခံနီပေးမေတြက ဝေင်းတင်ပေဗုကားဝေပျာပါ)

Hi, my name is _____; and I am part of a study team looking understand things farmers do to increase maize yields. The study includes a discussion of this issue and will take about 20 minutes. I would like to hear your experience and thoughts on this topic. You are not obligated to participate in the study and no services will be withheld if you decide not to participate. Likewise, if you chose to be interviewed you will not receive any gifts, special services, or remuneration. Everything we discuss will be held in strict confidence and will not be shared with anyone else.

Would you like to participate in the study? [If not, thank them for their time.]

Section A - Doer/Non-doer Screening Questions

- အဓိက ဘာလုပ်နိုး လုပ်ကြသလဲ။
What is your primary occupation?
 a. farmer
 b. other than farmer → End interview and look for another respondent
 c. Don't Know / Won't say → End interview and look for another respondent
- ပျဗုခဲတုံးပွင့် ဝေပျာင်းပွင့်ဖိုလား။
Last year, did you grow maize?
 a. Yes → Go to next question
 b. No → End interview and look for another respondent
 c. Don't Know / Won't say → End interview and look for another respondent
- ပျဗုခဲတုံးပွင့် ဝေပျာင်းပွင့်ဖို ပဲဝေရာစိုက်လား။
Did you intercrop pulses with maize last year?
 a. Yes → Continue to next question.
 b. No → Mark as Non-doer
 c. Don't Know / Won't say → End interview and look for another respondent

DOER /NON-DOER CLASSIFICATION TABLE

DOER (all of the following)	Non-Doer (any ONE of the following)	Do Not Interview (any ONE of the following)
Question 1 = a	Question 1 = a	Question 1 = b or c
Question 2 = a	Question 2 = a	Question 2 = b or c
Question 3 = a	Question 3 = b	Question 3 = c

Group: Doer Non-doer

Section B - Research Questions

Behavior Explanation
 ဝေပျာငှားဝေပျာငှား ပဲအမ်းမီးခိရောစိုက္ကားဝေပျာငှားပတ္တကပ္ပီး ဝေမးဒြးဝေမးတြးမးပါမယု။ ပဲအမ်းမီးခိရောစိုက္ တယွီတြာ
 ဝေပျာငှားဖူးတြးမးမ္ပ အနညးဆိုး ပဲ တစွဲးစိုက္ကားကို ဆိုလိုဗ်ဗာ ဂျဖစ့တယု။

In the following questions I am going to be talking about intercropping pulse. Intercropping pulses mean at least one kind of pulse is/are sowing between maize plants.

(Perceived Self-efficacy)

- 1a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကား ဘာဝေပျာငှားလြာမ္ပတြာ လုပုးဝိငွေလဲ။
 What makes it *easier* for you to intercrop pulses with maize?
- 1b. **Non-doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကား ဘာဝေပျာငှားလြာမ္ပတြာ လုပုးဝိငွေလဲ။
 What would make it *easier* for you to intercrop pulses with maize?
 (Write all responses below. Probe with "What else?")

- 2a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားဖို၊ ဘာအခက္ခဲခဲရွိသလဲ။
 What makes it *difficult* for you to intercrop pulses with maize?
- 2b. **Non-doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားဖို၊ ဘာအခက္ခဲခဲရွိလားဝိငွေလဲ။
 What would make it *difficult* for you to intercrop pulses with maize?
 (Write all responses below. Probe with "What else?")

(Perceived Positive Consequences)

- 3a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားပျာငှားရဲ၊ အားသာခဲကွဲးက ဘာဝေတြာလဲ။
 What are the *advantages* of intercropping pulses with maize?
- 3b. **Non-doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားပျာငှားရဲ၊ အားသာခဲကွဲးက ဘာဝေတြာရွိလားဝိငွေလဲ။
 What would be the *advantages* of intercropping pulses with maize? (Write all responses below. Probe with "What else?")

(Perceived Negative Consequences)

- 4a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားပျာငှားရဲ၊ အားနညးခဲကွဲးက ဘာဝေတြာလဲ။
 What are the *disadvantages* of intercropping with maize?
- 4b. **Non-doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကားပျာငှားရဲ၊ ဘာအားနညးခဲကွဲးက ဝေတြာရွိမလဲ။
 What would be the *disadvantages* of intercropping 2 or more pulses with maize? (Write all responses below. Probe with "What else?")

(Perceived Social Norms)

- 5a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကား၊ ဘယွီတြာက လကံ/ဒြးပျီ/ဝေထာကံ/သေဘာတူ/အတညးပျီပါသလဲ။
 Who are the people that *approve* of you intercropping pulses with maize?
- 5b. **Non-doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကား၊ ဘယွီတြာက လကံ/ဒြးပျီ/ဝေထာကံ/သေဘာတူ/အတညးပျီမလဲ။
 Who are the people that *would approve* of you intercropping pulses with maize? (Write all responses below. Probe with "Who else?")

(Perceived Social Norms)

- 6a. **Doers:** ဝေပျာငှားဝေပျာငှား ပဲ ဝေရောစိုက္ကား ဘယွီတြာက ဒြးပျီတာလဲ။
 Who are the people that *disapprove* of you intercropping pulses with maize?

6b. **Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ ဝေရာစိုက္ခဲယိရဲ ဘယျာတြက ခြဲငံ့မုပီမ္မာလဲ။

Who are the people that **would disapprove** of you intercropping pulses with maize? (**Write all responses below. Probe with "Who else?"**)

(Perceived Access)

7a. **Doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ ဝေရာစိုက္ခဲ ဘယျာလောကု ခက္ခဲသလဲ။

ဝေတာ့ဝေတာ့ခက္ခဲ။ နညးနညးခက္ခဲ။ အခက္ခဲမရွံ့ဘျားလား။

How difficult is it to intercrop pulses with maize?

7b. **Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ ဝေရာစိုက္ခဲယိရဲ ဘယျာလောကု ခက္ခဲမ္မာလဲ။

ဝေတာ့ဝေတာ့ခက္ခဲ။ နညးနညးခက္ခဲ။ အခက္ခဲမရွံ့ဘျားလား။

How difficult would it be to intercrop pulses with maize?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Cues for Action / Reminders)

8a. **Doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ ဝေရာစိုက္ခဲ သတိရမ္မတိဖို ဘယျာလောကု ခက္ခဲသလဲ။ ဝေတာ့ဝေတာ့ခက္ခဲ။ နညးနညးခက္ခဲ။

အခက္ခဲမရွံ့ဘျားလား။

How difficult is it to remember to intercrop pulses with maize?

8b. **Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ ဝေရာစိုက္ခဲယိရဲ သတိရမ္မတိဖို ဘယျာလောကု ခက္ခဲမ္မာလဲ။ ဝေတာ့ဝေတာ့ခက္ခဲ။

နညးနညးခက္ခဲ။ အခက္ခဲမရွံ့ဘျားလား။

How difficult would it be to remember to intercrop pulses with maize?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all

(Perceived Susceptibility / Perceived Risk)

9. **Doers and Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ အမိမိဝေရာစိုက္ခဲ ချခဲငံ့သညး ပုဝိးဝေဟကာငံ့ ပံက္ခိးဝိုငံ့ခေ

ဘယျာလောကု ခက္ခဲသလဲ။ ဂျဖစုးဝိုငံ့ခေခဲမံး၊ ဂျဖစုးဝိုငံ့ခေခဲနညး၊ ဂျဖစုးဝိုငံ့ခေခဲမရွံ့။

How likely is it that a lot of maize and pulses you intercrop will be damaged by pests?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perceived Severity)

10. **Doers and Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ အမိမိဝေရာစိုက္ခဲ ပုဝိးမးတးဝေဟကာငံ့ ဘယျာလောကု ဆိုဆိုဝါးဝါး

ပံက္ခိးဝိုငံ့ခေခဲ။ ဆိုဆိုဝါးဝါးလား။ နညးနညးလား။ ဘာမ္မုဖစ္ဘျားလား။

How serious would it be if a lot of your maize and pulses had damage by pests?

- a. Very serious
- b. Somewhat serious
- c. Not serious at all

(Action Efficacy)

11. **Doers and Non-doers:** ဝေပျာငှားဝံ့ဝံ့ပဲ အမိမိဝေရာစိုက္ခဲ ချခဲငံ့အား ဂျဖစုး ပံက္ခိးဝိုငံ့ခေ ဘယျာလောကု

ရွံ့လားဝိုငံ့ခေခဲ။ ဂျဖစုးဝိုငံ့ခေခဲမံး၊ ဂျဖစုးဝိုငံ့ခေခဲနညး၊ ဂျဖစုးဝိုငံ့ခေခဲမရွံ့။

How likely is it that a lot of your maize and pulses will be damaged if you intercropping?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

12. **Doers and Non-doers:** ဘုရားသခဲ ဒါမ္မမဟုတု မေကာငံ့ဆိုဝါးဝေဟကာငံ့ ဝေပျာငှားဝံ့ဝံ့ပဲ အမိမိအကြက္ခဲတယျာ

ထငါးလား။

Do you think that God or evil spirits cause poor harvest of maize and pulses?

- a. Yes
- b. Maybe

c. No

(Culture)

13. Doers and Non-doers: ဝေပျာငှားဝှားဝှား ပဲအမိမိဝှားဝှားကုသငှားဝှားဝှားပတ္တကွပီး ယဉ်ဝှားမး ဒါမွမဟုတ် ထိုးတမူးအစဉ်လာဝှားဝှား ဆန့်ကျင်ဝှားဝှားကြ/မကိုက္ကီမး ရှိပါသလား။

Are there any cultural rules or taboos against intercropping maize with 2 or more pulses?

- a. Yes
- b. Maybe
- c. No

ဝေဆြးဝေဝှားဝှားဝှားဝှားအာဟုကာငှားအရာနဲ့ မဆက္ပွဲဝေမးခြနးတစ္ဆေကို အခုဝေမးပါမယု။

Now I am going to ask you a question totally unrelated to the topic we've been discussing. (Question on Universal Motivators)

14. Doers and Non-doers: သငှားဘဝမွာ အလိုဆိုးဆိုးအရှိဆိုးတစ္ဆေကို ဝေပျာပျပါ။

What is the one thing you desire most in life?

THANK THE RESPONDENT FOR HIS OR HER TIME!