# Timor-Leste
# Better Food, Better Health Project
## Aileu, Baucau, Bobonaro & Cova Lima


# Baseline Report

**October 2018**

World Vision Pacific and Timor-Leste

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# 1. Acknowledgements

This report has been prepared as a collaborative effort by World Vision Australia (WVA) and World Vision Timor-Leste (WVTL). Contributors include Katy Cornwell (WVA), Nuno Alves (WVTL), Evangelita Pereira (WVTL), Heather Grieve (Independent Nutrition Consultant), Mateus Rosario (WVTL), Nuno Tolentino (WVTL), Judit da Costa (WVTL), Jose de Jesus (WVTL), Anacleto de Araujo (WVTL), Maria Fatima Ramos (WVTL), João Moniz (WVTL), Calisto do Nascimento (WVTL), Margareta de Araujo Laku (WVTL), Baltazar Ximenes (WVTL), Tomas Amaral (WVTL), Junilda Maria Vila Nova (WVTL), Jesuina Boavida (WVTL), Adão De Castro (WVTL), Catarina Jeronimo da Costa Freitas (WVTL), Felisbela Ramos (WVTL), Feliciano Luis (WVTL), Julio dos Santos (WVTL), Domingos Mouzinho (WVTL), Diana da Conceicão Abrantes (WVTL), Domingas Bere (WVTL), Abrão da Cruz (WVTL), Antonia Salamat (WVTL), Raul Schneider (WVPTL), Margy Dowling (WVA) and Sarah Shteir (WVA).

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# 2. Affirmation

This report is the original work of World Vision. Its purpose is to provide insight into the pre-program conditions of communities in the project's target areas in Aileu district. This is intended to provide input into overall project design, as well as form a baseline assessment for rigorous and fair evaluation of the Better Food Better Health (BFBH) Project in Aileu, Baucau, Bobonaro and Cova Lima municipalities of Timor-Leste.

# 3. Glossary

| Acronym | Full Description |
|---|---|
| ANC | Ante natal care |
| ANCP | Australian NGO Cooperation Program |
| BFBH | Better Food, Better Health (project) |
| BRACCE | Building Resilience to a Changing Climate and Environment (BRACCE) |
| CVA | Citizen Voice and Action |
| DHS | Demographic and Health Survey |
| DPT-3 | Third dose of the diptheria, pertussis (whooping cough) and tetanus vaccine |
| FMNR | Farmer Managed Natural Regeneration (FMNR) |
| HAP | Haburas Aileu project (food security) |
| HAP-N | Haburas Aileu nutrition project (food security with nutrition component) |

| | |
|---|---|
| HAZ | Height-for-age z-score |
| HH | Household |
| IEC | Information, Education and Communication |
| IYCF | Infant and young child feeding |
| ITT | Indicator tracking table |
| LIFE | Livelihood Improvement through Farmer Enterprise |
| MAF | Ministry of Agriculture and Fisheries |
| MAM | Moderate Acute Malnutrition |
| MNCHN | Maternal Newborn Child Health and Nutrition |
| MELF | Monitoring, Evaluation and Learning Framework |
| MUAC | Middle upper arm circumference |
| NGO | Non-Government Organisation |
| PDD | Program Design Document |
| PLWD | Person living with a disability |
| PSF | Community health promotors / volunteers |
| SBCC | Social and Behaviour Change Communication |
| SISCa | Integrated community health services (mobile health unit) |
| Stunted | HAZ <-2 |
| Superfoods | Soybeans, mung beans, red kidney beans, orange sweet potato, moringa and eggs. |
| Thinness | MUAC <23.5 |
| TOR | Terms of reference |
| Underweight | WAZ <-2 |
| Wasted | WHZ <-2 |
| WASH | Water, sanitation and hygiene |
| WHO | World Health Organization |
| WAZ | Weight-for-age z-score |
| WHZ | Weight-for-height z-score |
| WV | World Vision |
| WVA | World Vision Australia |
| WVTL | World Vision Timor-Leste |
| WVPTL | World Vision Pacific Timor-Leste |

# 4. Executive Summary


## Abstract

World Vision (WV)'s Better Food, Better Health (BFBH) project is a nutrition-sensitive agriculture project aiming to improve nutrition for 31,806 direct beneficiaries in Timor-Leste. The project will promote production and utilisation of six 'superfoods': soybeans, mung beans, red kidney beans, orange sweet potato, moringa and eggs. This report presents the findings of the baseline study for the project conducted in 2017-18 and provides some recommendations.


## The Context

Timor-Leste has one of the highest rates of undernutrition globally. According to the most recent Demographic and Health Survey (DHS, 2016), the national prevalence of stunting[1], wasting[2] and underweight[3] among children 0 to 59 months was 46%, 24% and 40% respectively, and anaemia[4] prevalence amongst children 6-59 months is 40%. These rates all fall in the World Health Organisation (WHO)'s most severe category for public health significance, highlighting the nutrition situation in Timor-Leste is in a critical state. Undernutrition, particularly during pregnancy and the first two years of life, has been shown to have a devastating impact on child health and development, the effects of which persist into poor health, education and economy in adulthood. A growing young population coupled with severe rates of undernutrition places a heavy burden on Timor-Leste's national health system and future economic development.

## Project Overview

WV's BFBH project aims to reduce undernutrition by improving utilisation and demand for nutritionally diverse foods, and enhancing year-round access to these foods – particularly protein-rich foods. The project will promote production and utilisation of six 'superfoods': soybeans, mung beans, red kidney beans, orange sweet potato, moringa and eggs.

The BFBH project involves a social and behaviour change communication strategy, built on learnings from previous WV child health and nutrition projects in Timor-Leste.

Activities include:

- Establishing community groups: parents' clubs, farmer groups, food processing groups and savings and loans groups.
- Promoting, training and supporting 'superfood' production and utilisation, improved agricultural techniques and technologies including Farmer Managed Natural Regeneration (FMNR), perennial kitchen gardens, post-harvest processing, preservation and storage (e.g. production of tofu and tempeh).

[1] Height for age less than 2 standard deviations from median reference population.
[2] Weight for height less than 2 standard deviations from median reference population.
[3] Weight for age less than 2 standard deviations from median reference population.
[4] Hb<110g/L.

- Training and supporting community health volunteers (PSFs) to facilitate parent club meetings, perform home visits and undertake child growth monitoring and health promotion during SISCa (Integrated Community Health Services) visits.
- Strengthening and expanding markets for products through private sector partnerships.

**Project Goal: Children under 5 and their mothers are well nourished**

Outcome 1: Caregivers of under 5 children have improved nutrition and health seeking practices

Outcome 2: Households have improved access to 'superfoods'

Outcome 3: Households have increased income from 'superfood' production

Outcome 4: Improved sustainability of health and agriculture services

Direct beneficiaries include children 0-59 months and their caregivers, pregnant women, partners of these caregivers and pregnant women, agricultural households and PSFs in 22 villages (suku) across Aileu, Baucau, Bobonaro and Cova Lima municipalities. The project intends to support 31,806 direct beneficiaries, 16 health posts, 120 PSFs, 287 parents' clubs, 87 farmer groups, 92 savings and loans groups and 21 food processing groups.

## Baseline Study Purpose

The baseline study was conducted internally by World Vision and has sought to understand the pre-program conditions, knowledge, attitudes and behaviours of the target population with respect to child health and nutrition, and superfood consumption, production and sales. This will provide input into overall project design, as well as provide a baseline for evaluation of the project's activities towards achieving project goals, outcomes and outputs. It also forms a basis from which to contribute to the knowledge base on nutrition-sensitive agriculture in Timor-Leste, and particularly, the role of protein- and iron-rich foods.

## Method and Design

The baseline study covered all 22 BFBH project suku as well as non-project comparison groups in all four municipalities, to allow for future evaluation of project impact. It also allows for identification of synergies with prior WVTL programming experience, and in Baucau municipality, concurrent WVTL-implemented TOMAK (*To'os ba Moris Di'ak*) Farming for Prosperity project, which is also supported by the Australian Government. The total sample size was 2080 households – 1476 from project areas and 604 from comparison areas.

The study was designed as primarily a quantitative study, incorporating short-answer qualitative components in data collection tools. Core methods employed included primary data collection from households, semi-qualitative key informant interviews with PSFs, and recording of GPS locations of key community infrastructure such as health posts and markets. Data collection at the household level included anthropometric and haemoglobin measurements – a rare contribution in a baseline study. The Multidimensional Poverty Index (MPI) was used to obtain a poverty rate for project and comparison groups.

## Key Findings

### Project Goal: Children under 5 and their mothers are well nourished

Across the Study sites, the prevalence of stunting in children (aged 0-59 months) ranged from 45%-53%, wasting 11-23%, underweight 34-47% and anaemia 39-68%. These prevalence rates reflect what the WHO classes as a critical public health concern. Very high rates of anaemia was found among mothers of these children (24-45%) and pregnant women (41-64%).[5] Although the prevalence of anaemia is high, in many cases the degree of anaemia is mild and therefore can potentially be improved with dietary adjustment such as that to be promoted through BFBH.

Traditional gender roles – that men are the final decision-makers and hold the power in the household, while women are responsible for the home and should not work outside – are strong among the target group, and data suggests this view is particularly strong among men. This highlights the benefits that education and involvement of men in parents' club activities may bring for gender equality.

### Outcome 1: Caregivers of under 5 children have improved nutrition, hygiene and health-seeking practices (including family planning)

Indicators under Outcome 1 vary considerably by project area municipality. In almost all indicators, the Cova Lima sample presents by far the worst outcomes. This is indicative of a systemic concern in Cova Lima.

**Nutrition:**

- 54-80% of children aged 0-5 months are exclusively breastfed.
- 28-75% of children aged 12-23 months received breastmilk in the last 24 hours.
- 3-13% of children aged 6-59 months satisfy the WHO's Minimum Dietary Diversity – that is, consumption of complementary foods from at least 4 food groups. The typical Timorese child is consuming well short of this at only 2 food groups.
- Consumption of any of the 6 'superfoods' in the last 24 hours is low for children and their mothers, suggesting a lack of access to such foods rather than a lack of knowledge that these foods are good for children: if the household has access to superfoods, both mother and child consume them.

**Hygiene:** Knowledge of hygiene practices is high, yet the practice of handwashing with soap (as indicated by the availability of soap and water) is low.

**Health:**

- 74-97% of mothers report attending 4 antenatal care (ANC) visits, and 48-78% had their partner attend at least some of these.
- Birth in the home (35-71% of children aged 0-59 months) and lack of attendance by a skilled health professional (doctor, nurse or midwife: 33-75%) tend to go hand in hand. Reasons include no time (baby came too quickly), lack of transport and distance to health facilities.
- 11-59% of children aged 0-59 months attended SISCa in the last 3 months.
- 33-82% of children aged 4-59 months have received the third course of diphtheria, pertussis and tetanus (DPT3) or Pentavent vaccine.

[5] Hb<120g/L for non-pregnant women and Hb<110g/L for pregnant women; women aged 15-49.

### Outcome 2: Households have Improved access to 'superfoods'

Generally speaking, very few 'superfood' crops are grown and therefore eaten by households, with the exception of mung beans and moringa in Bobonaro. Households in Cova Lima consistently appear to fare worse with regards to superfood utilisation and availability. Moringa is grown in Bobonaro and Cova Lima but is virtually non-existent in Aileu and Baucau. While many households have chickens, eggs are not produced or obtained frequently and chickens are commonly lost. Less than 10% of households utilise secure chicken housing and less than 5% have had their chickens vaccinated.

### Outcome 3: Households have increased income from 'superfood' production

Very few households in Aileu or Baucau earned income from 'superfood' crops in the last 12 months. 'Superfoods' are more commonly sold in Bobonaro, except for moringa which, while being the most common 'superfood' crop grown in the municipality, is rarely sold. Only 10% of households in Aileu sold chickens or eggs, but this was higher in Baucau (28%), Bobonaro (34%) and Cova Lima (42%).

### Outcome 4: Improved sustainability of health and agriculture services

This project outcome will be facilitated through support for Citizen Voice and Action groups, community groups whereby members and the wider community can work together to affect changes to public service quality and accountability. At baseline, these groups did not exist. Indicators include respondent perception and satisfaction levels:

- 19-51% of respondents were confident to voice their opinions in public.
- 20-47% were confident they could make change to public service quality and accountability in their community.
- 29-51% were satisfied with public services in their community.

Respondents in Cova Lima report some of the lowest rates of confidence and satisfaction, and women tended to report much lower rates of confidence than men.

## Summary and Recommendations

Acknowledging the large variation between the project sites (e.g. access to foods, agricultural practices etc), improving the nutrition profile of women and children will require a diverse and tailored set of sustainable interventions to be implemented. These will include strategies to improve the production and utilisation of home grown nutrient rich foods, particularly those rich in protein and iron. By taking a multipronged approach to increase demand for a more diverse diet, WVTL's BFBH project is well-set to achieve improvements in the health and nutritional status of women and children in the project areas.

The results of the study have led to the development of a set of specific recommendations including:

### 1. Consider prioritising and tailoring 'superfoods' by location.

### 2. Promote 'superfoods' in everyday cooking, not just special recipes.

In order for 'superfoods' to be eaten daily, they need to be seen as everyday foods that can simply be added to meals using current cooking methods. Recipes that require increased effort or complexity, a second fireplace or long cooking times will not be as readily adopted as the simple message to eat them cooked in whatever way the current meal is being prepared (e.g. plain boiled, steamed or fried).

3. Acknowledge (and where appropriate, address) norms and taboos.

4. Investigate the potential to grow and consume orange sweet potato, as is the practice with cassava

With a long in-ground cultivation time, cassava and local tubers are often "stored" in the ground and harvested in times of rice shortage. Their vines and leaves are eaten as a green leafy vegetable. Consider whether a similar practice could be adopted for orange sweet potatoes.

5. Support PSFs to encourage pregnant women develop realistic birth plans, that is, birth plans that acknowledge and address the practical limitations of poor transportation facilities and road access

6. Investigate why households do not put hygiene knowledge into practice.

Households generally know when they should wash their hands, but soap and water is not commonly available. While it may be beyond the scope for BFBH to address water access issues, investigation may reveal some simple community-based means by which to address barriers to this practice.

7. Investigate the preferences and barriers to selling 'superfoods'.

Even in areas where 'superfoods' are more commonly grown, few households report selling them. Investigation into the specific preferences and barriers to selling these foods should be undertaken, to determine the potential for consumption versus market.

8. Include training and promotion of secure chicken housing in group activities.

BFBH provides PSF the incentive of a 'chicken package' – training, improved chicken housing, a rooster, 10 hens and chicken feed. With many households owning chickens and facing severe losses of both chickens and eggs, large improvements in the availability of eggs for sale and home consumption could be gained through promotion of secure chicken housing at the household level.

9. Consider promoting a reduction in salt, sugar and caffeine in the diets of children.

10. Utilise farmer group monitoring data for production and yield indicators rather than household recall.

11. Supplement the quantitatively-heavy baseline with future qualitative studies throughout the project life.

12. Collect individual-level disability (and gender) outcome indicators through monitoring processes.

13. Work collaboratively with the Ministry of Health and other development partners in Cova Lima to address systemic issues.

14. Conduct further analysis using the baseline data.

The baseline data is a rich source of information, providing an opportunity for future in-depth analysis to gain a greater understanding of the household nutrition and agricultural practices in Timor-Leste.

# 5. Project Background

| Table 5.1<br>Project Summary | | | | |
|---|---|---|---|---|
| **Project Name:** | **Better Food, Better Health** | | | |
| Project number: | 1TMP083, T206531 | | | |
| Country: | Timor-Leste | | | |
| Start and end date of project: | 1 November 2017 to 30 June 2021<br>(Pilot in Aileu municipality from 1 July 2016) | | | |
| Total project budget: | USD 6,772,995 | | | |
| Source of funding: | DFAT, ANCP | | | |
| Impact area population: | | | Target beneficiaries (direct): | |
| Men | 22,737 | | Men | 11,368 |
| Women | 21,792 | | Women | 10,896 |
| Boys | 9,744 | | Boys | 4,872 |
| Girls | 9,339 | | Girls | 4,670 |
| Total: | 63,612 | | Total: | 31,806 |
| **Municipality** | **Aileu** | **Baucau** | **Bobonaro** | **Cova Lima** |
| Start and end date of Project | 1 July 2016 to 30 June 2020 | 1 November 2017 to 30 June 2020 | 1 November 2017 to 30 June 2020 | 1 November 2017 to 30 June 2020 |
| Date baseline data completed | 11 July 2017 | 23 March 2018 | 6 February 2018 | 23 February 2018 |
| Target beneficiaries (direct) | | | | |
| Men | 2,935 | 3,985 | 2,122 | 2,122 |
| Women | 2,700 | 3,831 | 2,056 | 2,056 |
| Boys | 1,258 | 1,708 | 909 | 909 |
| Girls | 1,157 | 1,642 | 881 | 881 |
| Total: | 8,050 | 11,166 | 6,622 | 5,968 |
| National Office M&E Contact: | Nuno Alves Da Costa | | Support Office M&E Contact: | Katy Cornwell |

Timor-Leste has one of the highest rates of undernutrition globally. According to the most recent Demographic and Health Survey[6] (DHS), the national prevalence of stunting[7], wasting[8] and underweight[9] among children (aged 0 to 59 months) was 46%, 24% and 40% respectively, and anaemia[10] prevalence amongst children (aged 6-59 months) was 40%. These prevalence rates all fall in the World Health Organisation (WHO)'s most severe category for public health significance, highlighting the situation of undernutrition in Timor-Leste is in a critical state. Undernutrition, particularly during pregnancy and the first two years of life, places a child at high risk of impaired growth and development impacting on health, educational outcomes and economic opportunities later in life.[11] A growing young population coupled with severe rates of undernutrition places a heavy burden on Timor-Leste's national health system and future economic development.

[6] 2016 Timor-Leste Demographic and Health Survey: https://dhsprogram.com/pubs/pdf/FR329/FR329.pdf
[7] Height for age less than 2 standard deviations from median reference population.
[8] Weight for height less than 2 standard deviations from median reference population.
[9] Weight for age less than 2 standard deviations from median reference population.
[10] Hb<110g/L.
[11] See, for example: https://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/NutritionStrategyOverview.pdf

Undernutrition in Timor-Leste has numerous immediate, underlying and basic causes. Key drivers are thought to include low incomes, food insecurity, limited access to services and markets and a lack of knowledge and understanding around health and nutrition.[12] It has been estimated that 80% of the population – predominately in rural areas – are dependent of subsistence food production.[13] This dynamic introduces several consequential realities related to the types of food grown, consumption patterns and the role of the market with an integrated food system. Each of these is well known to play a critical role in terms of improving household food security and nutrition. World Vision (WV)'s Better Food, Better Health (BFBH) project intends to respond to these causes by implementing an integrated, multi-sectoral nutrition-sensitive agriculture project. The project aims to reduce undernutrition by improving the utilisation and demand for nutritionally diverse foods, and enhancing year-round access to nutritionally diverse foods – particularly protein-rich foods.

Better Food, Better Health (BFBH) is funded by the Australian NGO Cooperation Program (ANCP), with a value of $6.77 million over 3.6 years (November 2017 – June 2021). It aims to bring about positive nutrition outcomes for approximately 31,806 direct beneficiaries in Aileu, Baucau, Bobonaro and Cova Lima municipalities in Timor-Leste. Direct beneficiaries will include children under the age of five and their caregivers, pregnant women, partners of these caregivers and pregnant women, agricultural households and community health volunteers (PSFs).

## Project Activities and Target Coverage

Built on the learnings from previous WV child health and nutrition projects, the BFBH project will implement a social and behaviour change communication (SBCC) strategy and will introduce new and innovative approaches to target local, regional and national stakeholders. One intervention that will be expanded is parents' clubs. WVTL intends to establish 287 clubs, and train 120 community health volunteers (PSFs) to facilitate parent club meetings. PSFs will also be trained to perform home visits and undertake child growth monitoring and health promotion during SISCa (Integrated Community Health Services) visits. To promote the sustainability of these interventions, WVTL will work to strengthen village health committees and engage provincial government departments (nutrition, health promotion) to support the work of PSFs. This includes refresher training and ensuring PSFs are included in related health trainings (growth monitoring, basic Moderate Acute Malnutrition (MAM) management, infant and young child feeding (IYCF)) provided through the provincial government annual plan. In acknowledgement of their additional workload, PSF will be supported with a 'chicken incentive package', consisting of training, improved chicken housing, a rooster, 10 hens and chicken feed.

The project will centre on promotion of production, utilisation and processing of six 'superfoods' – soybeans, mung beans, red kidney beans, orange sweet potato, moringa and eggs. In supporting the production of these foods, the project aims to improve the quantity and nutritional quality of agricultural yields, as well as increase household income for food and beneficial non-food expenditures such as health and education.

Eighty-seven farmers groups will be trained on improved agricultural techniques and technologies, including Farmer Managed Natural Regeneration (FMNR). Parents clubs and farmer groups will be

[12] Project Design Document
[13] http://www.agriculture.gov.au/animal/health/timor-leste-village-poultry

supported to establish perennial kitchen gardens, and women will be supported with blenders as a labour-saving device in preparing food like fruit and vegetable smoothies including soy milk production appropriate for children under five. Post-harvest processing, preservation and storage methods (including production of tofu and tempeh) will be introduced and 21 processing groups formed, as well as 92 savings and loans groups. Existing private sector partnerships will be strengthened and forged to expand markets for producer group members.

The project beneficiaries and groups by municipality are provided in the table below.

**Table 5.2**
**Project Target Beneficiaries and Coverage**

| Municipality | **Aileu** | **Baucau** | **Bobonaro** | **Cova Lima** | **Total** |
|---|---|---|---|---|---|
| Sub municipalities | 1<br>Aileu Vila | 1<br>Baucau | 1<br>Balibo | 1<br>Zumalai | 4 |
| Sukus (villages) | 5<br>Fahiria<br>Hoholau<br>Seloi Craic<br>Seloi Malere<br>Suku Liurai | 7<br>Buibau<br>Gariuai<br>Uailili<br>Buruma<br>Samalari<br>Seical<br>Trilolo | 5<br>Balibo Vila<br>Cowa<br>Leohito<br>Leolima<br>Sanirin | 5<br>Lepo<br>Lour<br>Raimea<br>Tashilin<br>Zulo | 22 |
| Number of aldeia(sub-villages) | 34 | 43 | 24 | 24 | 125 |
| Beneficiary population | 8,050 | 11,166 | 6,682 | 5,969 | 31,806 |
| Number of health posts | 4 | 5 | 4 | 3 | 16 |
| Number of participating PSFs | 35 | 35 | 25 | 25 | 120 |
| Number of participating parents' clubs | 68 | 123 | 48 | 48 | 287 |
| Number of participating farmer/FMNR groups | 34 | 21 | 17 | 15 | 87 |
| Number of participating savings & loans groups | 25 | 28 | 24 | 15 | 92 |
| Number of participating food processing groups | 4 | 7 | 5 | 5 | 21 |

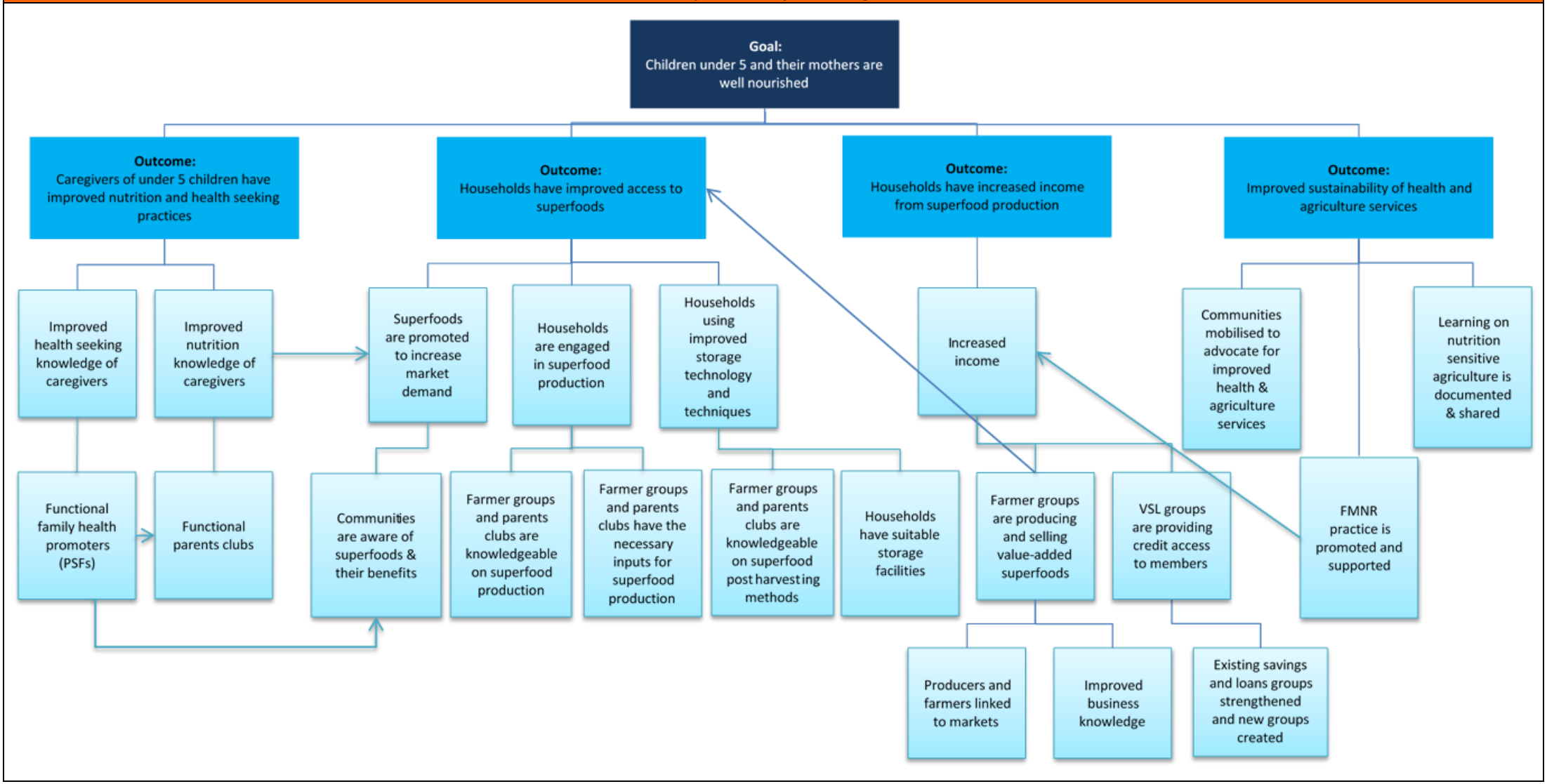
Project stakeholders and collaborators include:

- Ministry of Agriculture, Forestry and Fisheries, national level (government)
- Secretary of State of Environment, national level (government)
- Secretary of State of Agroforestry and Natural Conservation, national level (government)
- Institute for Enterprise Development (Instituto de Apoio Desenvolvimento Empresarial), national level (government)
- Ministry of Commerce, Industry and Environment, national level (government)
- Ministry of Health, national level (government)
- National Health Institution, national level (government)
- District Health Service, local level (government)
- District Administration, local level (government)
- Health Posts, village level (government)
- Dili Mart supermarket (business sector)

- Leader supermarket (business sector)
- Timor Global (business sector)
- Permatil (local NGO)

Figure 5.1 overleaf shows the theory of change. The complete project design documents, including logframe, are attached in Annex 1.

**Figure 5.1**
**Project Theory of Change**



# 6. Baseline Study Purpose and Objectives

WV recognises the importance of rigorous research and evaluation to demonstrate the value and impact of its development programs, particularly in the area of resilience and livelihoods, within which this project sits. In addition, there is a general lack of evidence about resilience and livelihoods projects and their impact on child nutrition and wellbeing from countries in the Pacific region. Future evaluation of the BFBH provides an opportunity to explore and build a strong evidence base in these important areas for WV internally and to contribute to the global database.

The Baseline Study ('the Study') was led by Katy Cornwell (Senior Evidence and Learning Advisor (Economic Development), WVA), and Nuno Alves (Baseline and Evaluation Officer, WVTL). The work is a collaborative effort between WVA and WVTL.

The Study was conducted to understand the pre-program conditions, knowledge, attitudes and behaviours of the target population with respect to child health and nutrition, and 'superfood' utilisation, production and sales. This information will inform project design and provide a baseline from which to evaluate the project's achievements towards its goals, outcomes and outputs. The terms of reference (TOR) and evaluation plans for the Study are provided in Annex 2.

The objectives of the Study are to:

- Establish baseline values to facilitate the setting of realistic project targets and the periodic measurement of accomplishments.
- Complete the indicator tracking table (ITT), monitoring and evaluation (M&E) plan for the project design, and set-up relevant monitoring tools.
- Reflect on key evaluation and learning questions for the overall BFBH project: a list of these key questions is given in Annex 3.
- Form a basis from which to contribute to the knowledge base on nutrition-sensitive agriculture in Timor-Leste, and particularly, the role of protein- and iron-rich foods.

Table 6.1 outlines the logframe indicators for collection at baseline. Specific definitions for indicators are provided in Annex 1. Note that the project started as a pilot in Aileu municipality in July 2016 with a baseline conducted in July 2017. Based on these findings and the experience implementing the pilot project, the project logframe was revised to produce that in Annex 1. Some of the changes (additions to the pilot version) meant that some baseline indicator values are not available for Aileu. These indicators will likely be revised on an ongoing basis as the project design is developed and refined.

Due to the amount of data required at baseline to calculate values of logframe indicators, the Study was mostly quantitative. It is anticipated that the midline and lot quality assurance sampling (LQAS) studies throughout the project will be largely qualitative in order to triangulate and further validate and analyse the quantitative results of the baseline study. In particular, these should have a heavy focus on gender dynamics with regard to outcome indicators.

| Table 6.1<br>Logframe Indicators for Collection at Baseline | | |
|---|---|---|
| **Summary of objectives** | **Indicator** | |
| GOAL:<br><br>Children under 5 and their mothers are well nourished | G.1. | % stunting in children/boys/girls (aged 0-59 months)(length/height for age<-2SD) (CIA.0008). |
| | G.2.1 | % wasting in children/boys/girls (aged 0-59 months) (weight for height<-2SD). |
| | G.2.2 | % wasting in children/boys/girls (aged 6-59 months) (MUAC) |
| | G.2.3 | % thinness in mothers of children 0-59 months (MUAC). |
| | G.2.4 | % thinness in pregnant women(aged 15-49) (MUAC). |
| | G.3 | % underweight in children/boys/girls 0-59 months (weight for age<-2SD). |
| | G.4 | % diarrhoea in the last 2 weeks among children/boys/girls 0-59 months. |
| | G.5.1 | % anaemia in children/boys/girls (aged 0-59 months) |
| | G.5.2 | % anaemia in mothers of children (aged 0-59 months) |
| | G.5.3 | % anaemia in pregnant women (aged 15-49). |
| | G.5.4 | % people (men, women, men with disability, women with disability) in agreement with key gender attitude statements. |
| | G.5.5 | % households where women or men and women jointly make key health and nutrition related decisions. |
| OUTCOME 1:<br><br>Caregivers of under 5 children have improved nutrition and health-seeking practices | 1.1.1 | % mothers of children (aged 0-59 months) who report attending 4 or more ANC visits while pregnant with their youngest child (CIC.0156). |
| | 1.1.2 | % mothers who were accompanied by their husband/partner at ANC visits while pregnant with their youngest child. |
| | 1.1.3 | % children (aged 0-59 months) whose birth was attended by a skilled health professional [MELF 1.307 - Number (x) of additional births attended by a skilled birth attendant]. |
| | 1.1.4 | % children/boys/girls (aged 0-59 months) who attended SISCa / health facility in the last 3 months. |
| | 1.1.5 | % children/boys/girls (aged 4-59 months) vaccinated against DPT3 [MELF 1.301 - Number (x) of girls and boys vaccinated (against DPT3 as the selected proxy indicator for vaccination)]. |
| | 1.2.1 | % children/boys/girls (aged 0-5 months) exclusively breastfed in the last 24 hours (CIA.0047). |
| | 1.2.2 | % children/boys/girls (aged 12-23 months) who received breastmilk in last 24 hours. |
| | 1.2.3 | % children/boys/girls (aged 6-59 months) consuming superfoods in the last 24 hours. |
| | 1.2.4 | % mothers of children (aged 0-59 months) consuming superfoods in the last 24 hours. |
| | 1.2.5 | % pregnant women consuming superfoods in the last 24 hours. |
| | 1.2.6 | Average number of food groups consumed by children/boys/girls (aged 6-59 months) in the last 24 hours. |
| | 1.2.7 | % households with children (aged 0-59 months) men are regularly involved in feeding & care for the child |
| | 1.3.1 | % households with children (aged 0-59 months) with appropriate handwashing facilities (CIB.0130) |
| | 1.3.2 | % carers (women, men, total) of children (aged 0-59 months) knowledgeable about basic hygiene practices [MELF 1.201 - Number (x) of people with increased knowledge of hygiene practices]. (Measured annually) |
| | 1.3.3 | % households where animals are prevented from entering the house. (Measured at baseline and endline) |
| | 1.4.1 | % of in-union women (aged 15-49 years) who report that they are currently using a modern contraceptive method (C1C.21229) |
| | 1.4.2 | % of in-union women (aged 15-49 years) who are continuous users of family planning (C1C.0363) |

| Table 6.1 (continued)<br>Logframe Indicators for Collection at Baseline | | |
|---|---|---|
| OUTCOME 2:<br><br>Households have improved access to superfoods | 2.1.1 | % households growing superfoods (any and disaggregated by superfood) either individually or as part of a collective effort (farmer group, parents' group). |
| | 2.1.2 | Annual volume (kg, number of eggs) of superfood produced among producing households (disaggregated by superfood). |
| | 2.1.3 | Average land area (ha) utilised for superfood production among producing households (disaggregated by superfood crop). |
| | 2.1.4 | % superfood-producing households processing superfoods (any). |
| | 2.2.1 | % households consuming superfoods in the last week (any and disaggregated by superfood). |
| | 2.2.2 | Average number of days in the last week households consumed superfoods (disaggregated by superfood). |
| | 2.2.3 | Average number of months in the last year households report having difficulty accessing superfoods (disaggregated by superfood). |
| | 2.3.2 | Average number of chickens lost/died in the last 12 months among households raising chickens. |
| | 2.3.1 | % households whose chickens have been vaccinated. |
| OUTCOME 3:<br><br>Households have increased income from superfood production | 3.1.1 | Average/median household income from sale of superfoods and their products, among superfood-producing households - either individually or as part of a collective effort (farmer group, parents' group) |
| | 3.1.2 | % households earning income from superfoods and superfood-related activities (production, labour, processing, sale) - either individually or as part of a collective effort (farmer group, parents' group). (any and by superfood) |
| | 3.2.1 | Average annual savings/funds mobilised per group. [not for collection at baseline] |
| | 3.2.2 | Average annual savings/funds mobilised per group member. [not for collection at baseline] |
| | 3.2.3 | Average amount of household savings. |
| OUTCOME 4:<br><br>Improved sustainability of Health and Agriculture Services | 4.1.1 | % people (women, men, women with disabilities, men with disabilities, total) attending CVA gatherings in the last 12 months. |
| | 4.1.2 | % people (women, men, women with disabilities, men with disabilities, total) reporting confidence in voicing their opinions in public. |
| | 4.1.3 | % people (women, men, women with disabilities, men with disabilities, total) reporting confidence in being able to make change to public service quality and accountability in their community. |
| | 4.1.4 | % people (women, men, women with disabilities, men with disabilities, total) reporting satisfaction with public services in their community. |
| | 4.2.1 | Number of hectares covered with FMNR. [not for collection at baseline] |
| | 4.3.1 | Average number of chickens owned by PSF |
| | 4.3.2 | Average number of eggs produced per month by PSF's chickens |
| | 4.3.3 | % PSF with improved chicken housing. |
| | 4.3.4 | % PSF whose chickens have been vaccinated. |
| | 4.3.5 | Average number of chickens lost/died in the last 12 months among PSF raising chickens. |

# 7. Study Method and Design

## Study Design

The Study covered all 22 BFBH suku as well as non-project comparison groups in the same four municipalities, and as such is expected to allow for future evaluation of project impact. A number of other factors were incorporated into the study design to explore earnings and synergies from natural (external to project) comparison groups including:

(1) Project areas have a diverse range of experiences with historical WVTL programming which could have synergies with BFBH programming.[14] In particular, Cova Lima represents a new location for WVTL. The variation in experiences allows for the impact of these to be observed in addition to the impact of the BFBH program. To maximise the differences in exposure, the baseline sample of aldeia comprised households from a large proportion of all BFBH aldeia (and fewer from pure comparison groups with no BFBH programming).

(2) Four of the seven target sukus in Baucau will simultaneously receive Farming for Prosperity (TOMAK) interventions operated by WVTL on behalf of DFAT. Thus both project and comparison groups in Baucau include those with and without TOMAK to form a basis from which the synergies and differences between BFBH and TOMAK interventions can be identified and addressed. To accommodate this, over-sampling in Baucau was necessary in order to obtain sufficient observations within each combination of BFBH and TOMAK programming (Refer to table 7.1). This means that results will be presented separately by municipality rather than as single overall project figures: calculation of overall project figures will need to be weighted to be reflective of the project area populations.

**Table 7.1**
**Impact Comparison Groups in Baseline Design**

| | Aileu | Baucau | Bobonaro | Cova Lima |
|---|---|---|---|---|
| Project Areas | | | | |
| BFBH only | ✓ | ✓ | ✓ | ✓ |
| BFBH + TOMAK | | ✓ | | |
| Comparison Areas | | | | |
| TOMAK | | ✓ | | |
| No current WVTL project | ✓ | ✓ | ✓ | ✓ |

[14] For example, are better outcomes observed in locations that have previously received WASH programming?

## Methodology and Tools

The Study was primarily quantitative, incorporating short-answer qualitative components in the data collection tools. Methodology included primary data collection from households, semi-qualitative key informant interviews with PSFs, and a location survey which collected GPS locations of relevant community infrastructure (e.g. health posts and markets). Data collected at the household level included anthropometric measurements and haemoglobin. Since the data collection was necessarily quantitative-heavy in order to obtain values for a diverse set of indicators, it is expected that the baseline study will be supplemented with further qualitative studies throughout the life of the project. In particular, these should focus on exploring gender dynamics in line with the project's gender and disability action plan and the key evaluation questions in Annex 3.

The household survey tool comprised a set of modules answered by households satisfying the following criteria:

1. **General household module**: all households answered this set of questions, which included household composition, living conditions, agricultural production, time use as well as standard assessment tools including multidimensional poverty, food security and women's empowerment.
2. **Mother-carer module**: only households with a child aged 0-59 months answered this set of questions, which included birth location, antenatal care (ANC), dietary intake, historical records from child health books, and undertaking anthropometric measurements of both mother and child.
3. **Pregnant woman module**: only households with a pregnant woman answered this set of questions, comprising ANC, dietary intake, birth plans and attitudes.

Annex 4 contains the data collection tools.

## Sampling and Data Collection

All 22 BFBH suku were included in the sample: 5 in Aileu; 7 in Baucau (3 with TOMAK and 4 without); 5 in Bobonaro; and 5 in Cova Lima. From the 125 aldeia within these suku, 78 were randomly selected for inclusion in the baseline sample with probability proportional to size (based on the 2015 population census). Some adjustment of the aldeia sample list was made to ensure all aldeias in the sample would have a sufficient number of children under five, and in Baucau, sufficient coverage of TOMAK and non-TOMAK aldeias.

In addition, 36 aldeias were selected to serve as non-project comparison areas (controls). These locations were selected based on the following criteria:

- Collectively covering a range of previous project experience, reflecting the range experienced in BFBH project areas, and some areas without any prior WVTL exposure.
- A mix of remote and not so remote locations in each sub-municipality.
- Agricultural production profiles similar to BFBH locations.

Table 7.2 outlines the number of aldeia selected for inclusion in the baseline sample, out of the total number of aldeias participating in BFBH and/or TOMAK, where applicable.

| Table 7.2<br>Number of Aldeia in Baseline Sample out of Total | | | | | |
|---|---|---|---|---|---|
| | **Aileu** | **Baucau** | **Bobonaro** | **Cova Lima** | **Total** |
| Project Areas | | | | | |
| BFBH only | 23 of 34 | 11 of 23 | 16 of 24 | 15 of 24 | 65 of 105 |
| BFBH + TOMAK | | 13 of 20 | | | 13 of 20 |
| Total | 23 of 34 | 24 of 43 | 16 of 24 | 15 of 24 | 78 of 125 |
| Comparison Areas | | | | | |
| TOMAK | | 6 of 10 | | | 6 |
| No current WVTL project | 9 | 6 | 6 | 9 | 30 |
| Total | 9 | 12 | 6 | 9 | 36 |

In each aldeia, a target of 18 households was established for inclusion. This number was partially determined to ensure sufficient observations in each of the comparison strata, and partially based on the number a field team could practically cover within the timeframe of the fieldwork.

The total project area sample size of 1,476 households is representative of the total target population of 5,652 households with a confidence level of 95% and confidence interval of 2.19.[15]

Table 8.1 outlines the total number of observations obtained during the fieldwork, and will be discussed under section 8: Sample Characteristics. A complete list of aldeias and the resultant sample size is provided in Annex 5.

Households were selected at random for interview using master household lists obtained from project planning activities or where these were not available, from aldeia chiefs. In addition, where possible, care was taken to ensure there were at least two households with pregnant women and two households with a person living with a disability (PLWD) included for interview in each of the sampled aldeias.[16]

In the Aileu (pilot) sample, households with and without children aged 0-59 months were intentionally sampled, so as to observe characteristics of agricultural households who would potentially benefit from the BFBH agricultural interventions. Oversampling of households with children aged 0-59 months was necessary in order to obtain a sufficient number of observations to calculate child-level indicators with reasonable statistical power. To do this, households in the master list were divided into two strata: those with children aged 0-59 months and those without. Within each strata, households were randomly selected with equal probability, but the total sample for each strata were not equal: in each aldeia, approximately 2/3 of the total households interviewed were selected from the strata with children aged 0-59 months, and 1/3 from the strata without children aged 0-59 months. This stratified sampling strategy yielded an overall sample 2/3 of which had children aged 0-59 months and 1/3 without.

[15] Confidence intervals for indicators based on subsets of the data will be larger than this.
[16] For the purposes of sampling at this level, households with a person with a disability were identified in discussions with the aldeia chief or PSF – in the analysis to follow, 'households with a person with a disability' were identified with a set of defined criteria as outlined in the subsequent section, regardless of this nomination.

For the baseline sample in expansion areas (Baucau, Bobonaro and Cova Lima), the sample was restricted to primarily households with children aged 0-59 months: households with and without children aged 0-59 months observed in Aileu sample were deemed to be sufficiently similar, and this restriction allowed for an adequate sample size to be collected in pilot and expansion areas within the time and budget constraints. In some expansion location aldeias there were fewer than the target 18 households with children aged 0-59 months available for interview. In these cases, households without children aged 0-59 months were interviewed – in most cases these were intentionally households with a pregnant woman or a PLWD.

In each location, data was collected by two teams consisting of a driver[17], a supervisor, 5-6 household survey data collectors, 1-2 anthropometric data collectors, and in Baucau, Bobonaro and Cova Lima, a Ministry of Health laboratory assistant. The Ministry of Health laboratory assistant were responsible for conducting the anaemia testing using a Haemocue™. Ethical clearance for the work was obtained through the Timor-Leste National Institute of Health, and protocols were put in place to refer any severely malnourished or severely anaemic persons to the appropriate health facility for health staff for follow up.

## 8. Sample Characteristics

In total, 2080 households in 114 aldeias were interviewed (1476 in project areas, 604 in comparison areas). Data was collected for 1819 children aged 0-59 months, 232 households with a pregnant woman, 227 households with a PLWD, and 88 where the household head was nominated as female. With the key respondent of interest being the carer of the child aged 0-59 months, the vast majority of respondents in the baseline sample were females of reproductive age (Refer to Table 8.1).

Since the Aileu sample included a small quota of households without children aged 0-59 months which did not require a primary caregiver as the respondent, the Aileu sample includes a greater number of male respondents. In the analysis to follow, data from all respondents are used to calculate statistics relating to general household and agricultural production, while child and carer-level statistics (as per indicator definitions) only use data from households with children aged 0-59 months. The slightly different Aileu sample allowed calculations to be made on some gender-related indicators for men and women separately.

In the Aileu sample, households with a PLWD were identified by self (respondent) report to the question “Does [household member] have a disability?”. In the Baucau, Bobonaro and Cova Lima sample, households with a disability were identified by responses to a set of diagnostic questions adapted from the Washington Group Short Set of Questions on Disability[18], and hence a slightly larger proportion of households are identified as having a PLWD (14% compared to 8% in the Aileu sample). Still, the number of households observed with a PLWD in the baseline sample is low. It is, however, similar to rates observed in other surveys where PLWD are identified by self-reporting, highlighting a varied perception of what is a “disability” and potentially misreporting due to stigma. Furthermore,

[17] While the driver did not collect data, they were considered an integral part of the field team.
[18] http://www.washingtongroup-disability.com/washington-group-question-sets/short-set-of-disability-questions/

only households, rather than individual members, with a disability were identified in the Baucau, Bobonaro and Cova Lima samples. This was necessary in order to limit the duration of the baseline questionnaire. As a result, it is recommended that the Washington Group questions should be used as part of program monitoring activities to identify persons living with a disability and to ensure they are included in project activities.

Unless otherwise indicated, all statistics and indicators presented relate to respondents and households in the project areas. The complete set of results for project and comparison areas, as well as results disaggregated by TOMAK status and sex are provided in Annex 6.

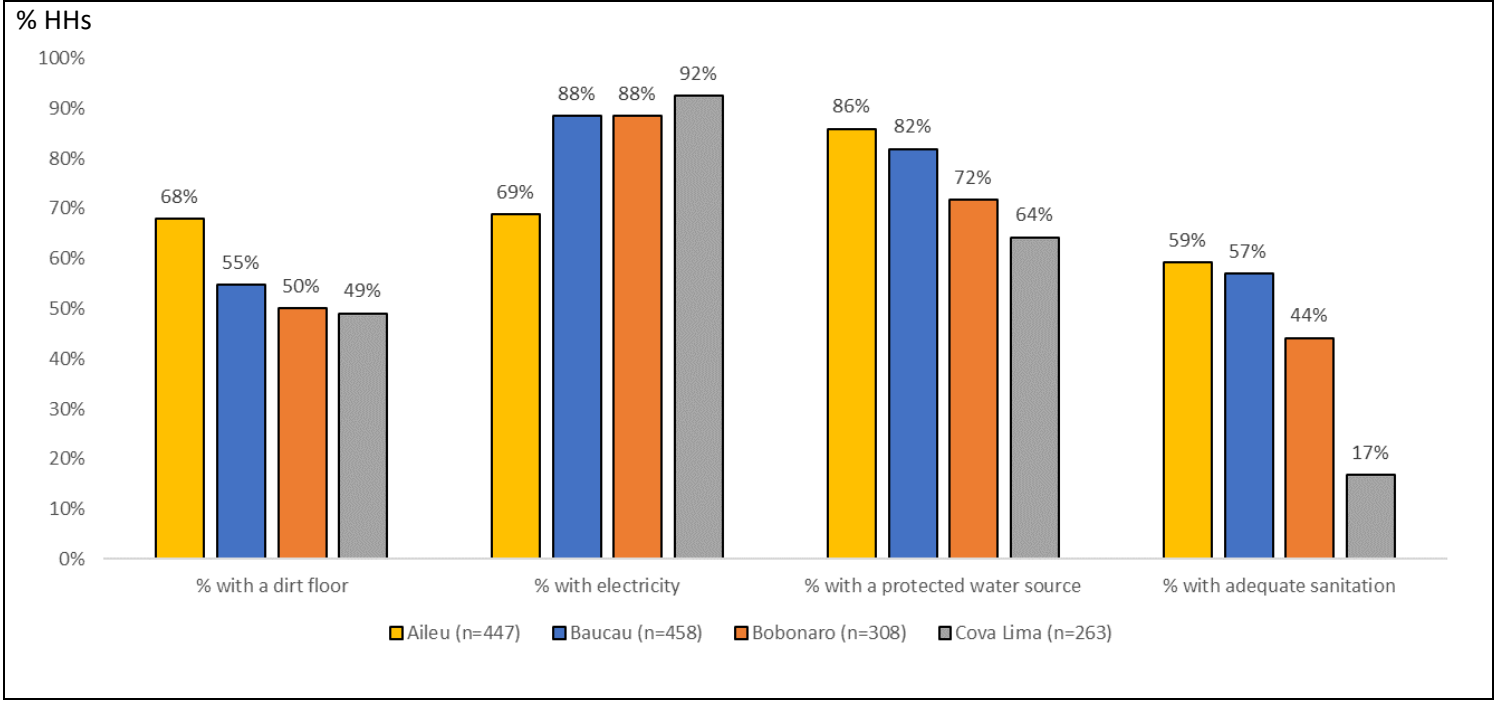
**Table 8.1**
**Baseline Sample Size**

| | Total number of aldeias | Number of aldeias in sample | Households with children aged 0-59 months | Households without children aged 0-59 months | Households with a pregnant woman | Households with a PLWD | Households with a female head | Male Respondents | Female Respondents | Total Households |
|---|---|---|---|---|---|---|---|---|---|---|
| Project areas: | | | | | | | | | | |
| Aileu | 34 | 23 | 298 | 149 | 31 | 37 | 24 | 61 | 386 | 447 |
| Baucau | | | | | | | | | | |
| with TOMAK | *23* | *11* | *180* | *11* | *26* | *33* | *10* | *1* | *190* | *191* |
| without TOMAK | *20* | *13* | *254* | *13* | *34* | *29* | *13* | *1* | *266* | *267* |
| total Baucau | 43 | 24 | 434 | 24 | 60 | 62 | 23 | 2 | 456 | 458 |
| Bobonaro | 24 | 16 | 299 | 9 | 27 | 43 | 15 | 3 | 305 | 308 |
| Cova Lima | 24 | 15 | 244 | 16 | 41 | 35 | 6 | 0 | 263 | 263 |
| Total project areas | 125 | 78 | 1275 | 198 | 159 | 177 | 68 | 66 | 1410 | 1476 |
| Comparison areas: | | | | | | | | | | |
| Aileu | | 9 | 102 | 41 | 13 | 9 | 6 | 20 | 123 | 143 |
| Baucau | | | | | | | | | | |
| with TOMAK | *10* | *6* | *117* | *6* | *24* | *9* | *2* | *1* | *122* | *123* |
| without TOMAK | | *6* | *104* | *2* | *12* | *14* | *5* | *0* | *106* | *106* |
| total Baucau | | 12 | 221 | 8 | 36 | 23 | 7 | 1 | 228 | 229 |
| Bobonaro | | 6 | 128 | 5 | 8 | 6 | 6 | 0 | 133 | 133 |
| Cova Lima | | 9 | 93 | 6 | 16 | 12 | 1 | 1 | 98 | 99 |
| Total comparison areas | | 36 | 544 | 60 | 73 | 50 | 20 | 22 | 582 | 604 |
| Total sample | | 114 | 1819 | 258 | 232 | 227 | 88 | 88 | 1992 | 2080 |

## 8.1 Living Conditions

Figure 8.1 summarises the living conditions of project-area households with respect to floor material, access to electricity, use of a protected water source (defined according to the Millennium Development Goals (MDG) guidelines: bottled, piped, protected well, protected spring or rainwater) and use of adequate sanitation (flush/pour, composting or ventilated improved pit (VIP) toilets).

**Figure 8.1**
**Household Living Conditions**
**% HHs in Project Areas**



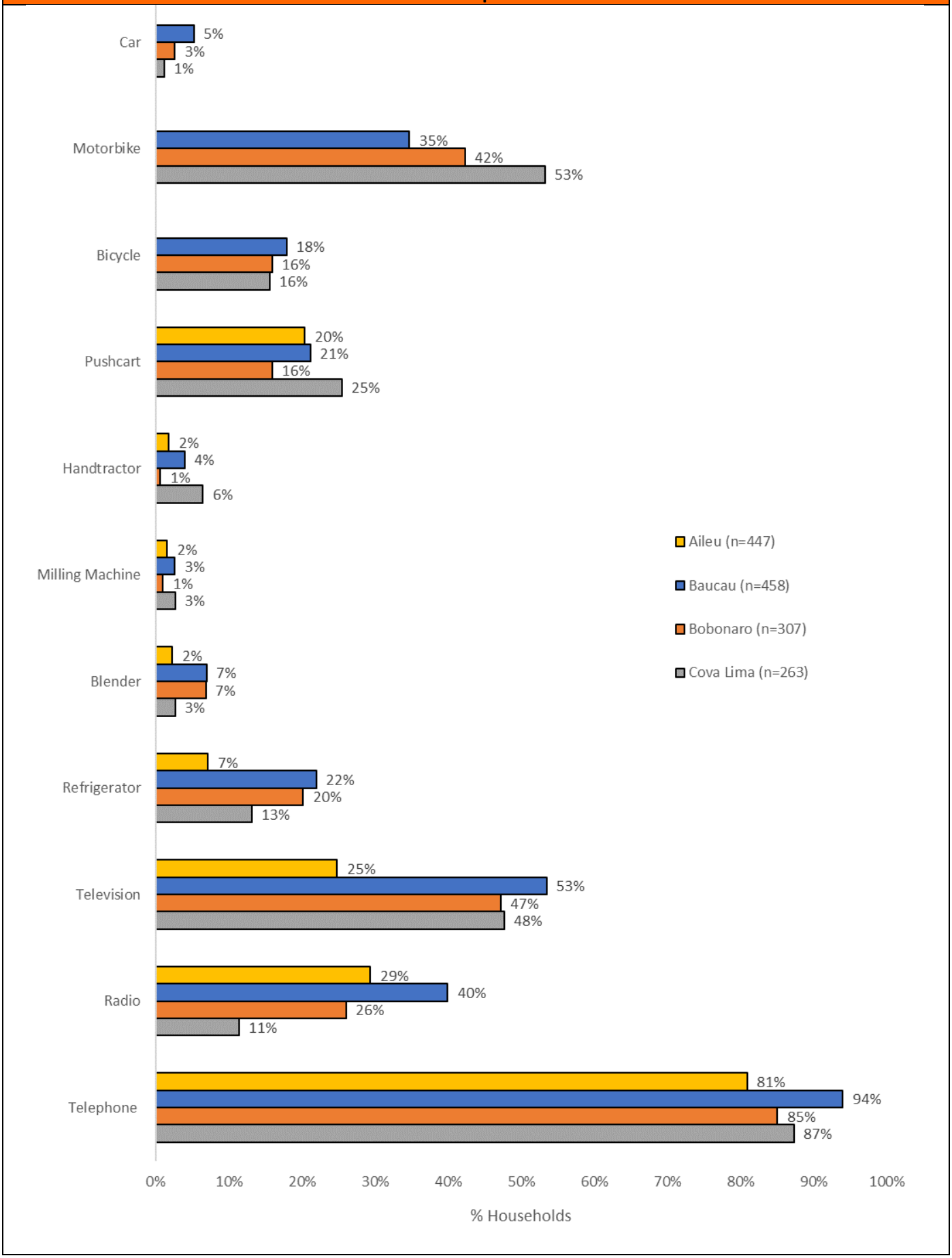

Households in Aileu project areas are more likely to have a dirt or sand floor (68%) and less likely to have access to electricity (69%) than households in other project locations, which have similar rates of around 50% and 90% respectively. The proportion of households with access to a protected water source is best in Aileu (86%) and poorest in Cova Lima (64%). However, while households may have access to a protected water source, they (often women and children) may need to walk long distances multiple times a day to access this source. Similarly, Aileu also has the highest rate of access to adequate sanitation at 59% in Aileu, and Cova Lima the lowest – by far – at only 17%. Moreover, rates for all four of these living condition indicators vary substantially by suku within the municipalities.

## 8.2 Ownership of Durable Assets

The vast majority of households own a telephone (81-94%). Some own a radio and/or television, few own a refrigerator (7%-22%) and electric blenders are rare (1-7%). Households in Baucau project areas consistently reported the highest ownership of these assets, while with the exception of radio, those in Aileu tend to report the lowest ownership, commensurate with the low proportion of households with electricity in Aileu project areas. Access to electricity will need to be considered when introducing and promoting the use of blenders as part of project activities.

The productive agricultural assets of milling machinery (e.g. coffee pulper, rice milling machine, etc.) and handtractors are also rare, suggesting agricultural productivity remains largely labour-intensive. Motorbikes are somewhat common in Baucau (35%), Bobonaro (42%) and more common in Cova Lima (53%) and some households have bicycles and/or pushcarts. Few households own a car, truck or microlet (minibus) – ownership of modes of transport (cars, bicycles and motorbikes) were unfortunately omitted from the Aileu survey. (Figure 8.2).

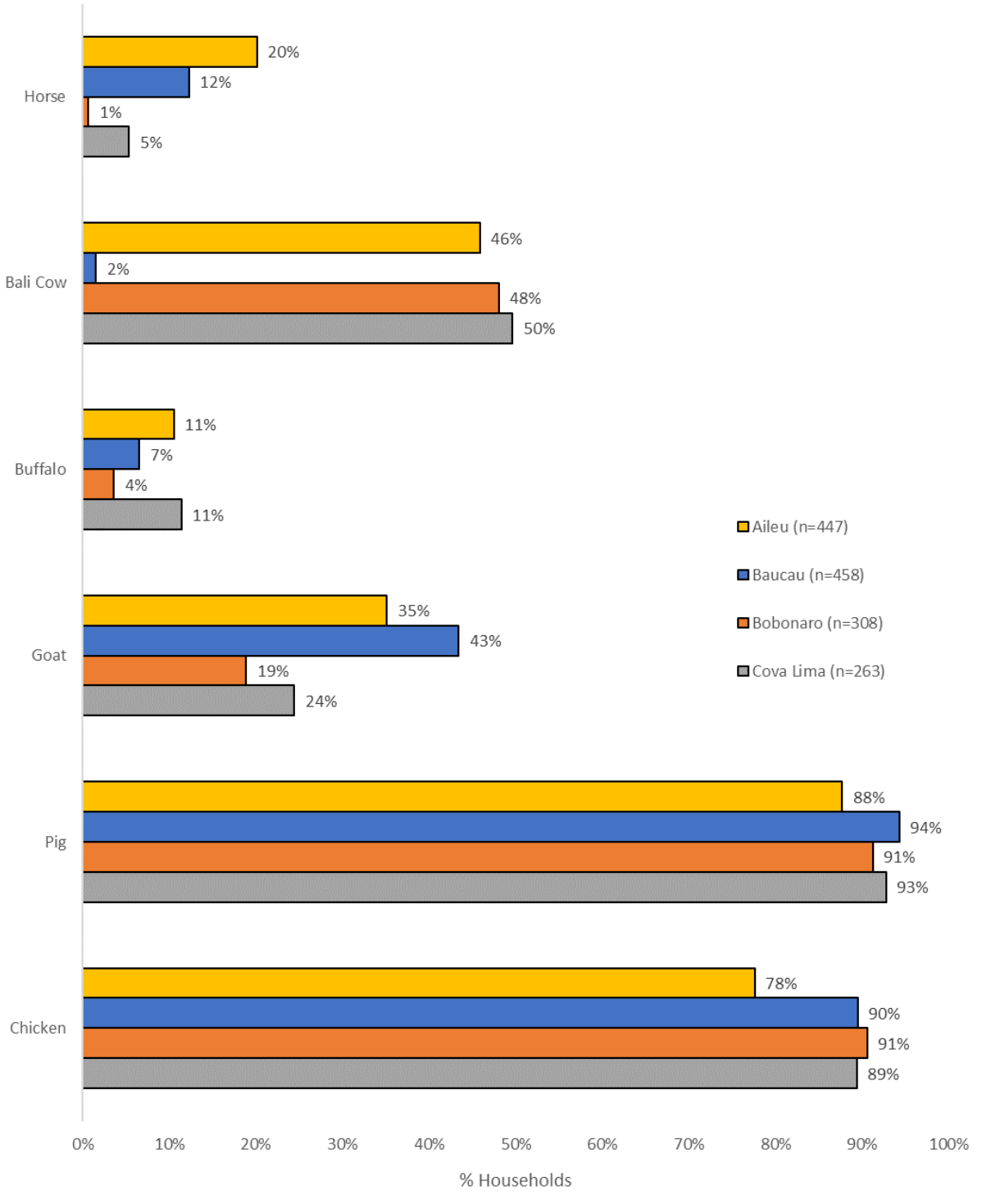
**Figure 8.2**
**Household Ownership of Durable Assets**



## 8.3 Livestock ownership

Chickens and pigs are owned by most households, followed by a moderate proportion of households owning goats and/or cows. Households in Baucau are most likely to own goats, but very few own cows or buffalo. This likely reflects the different geographical landscape in Baucau. (Refer to Figure 8.3)

**Figure 8.3**
**Household Ownership of Livestock**



## 8.4 Multidimensional Poverty Index

The Multidimensional Poverty Index (MPI) is an approach used to measure poverty or wellbeing, recognising that poverty and wellbeing have many dimensions including having enough food to eat, access to education, owning useful assets and having a home with basic facilities, etc. It can be used as a diagnostic tool to assess the overall wellbeing of a household or group of households and can be compared across locations or to another point in time.

Table 8.4.1 gives a brief definition of the components that make up the MPI across the 3 dimensions of health, education and living standards. These particular components and definitions were developed specifically for Timor-Leste by Cornwell, Inder and Datt (2015)[19]. More precise definitions of each indicator are given in Cornwell et al. (2015) and references contained therein. Considering these 10 components, a particular household is considered MPI-poor if they are deprived in 4 or more of the 10 individual components.

**Table 8.4.1**
**Timor-Leste Multidimensional Poverty Index**
**Components & Weights**

| Dimension | | Component | Weight |
|---|---|---|---|
| Education | E1 | No household member has completed five years of schooling | 1/10 |
| | E2 | At least one school-age child is not enrolled in school | 1/10 |
| Health | H1 | At least one child under 5 is malnourished (underweight)<br>*Malnourished: weight-for-age z-score >2 standard deviations below the median of the reference population* | 1/10 |
| | H2 | A child (under 18) has died in the last 5 years | 1/10 |
| Living Standards | L1 | Does not have electricity | 1/10 |
| | L2 | Does not have access to clean drinking water<br>*Clean drinking water: source is bottled, piped/standpipe, rainwater, borehole, tubewell, protected well or protected spring; & takes <30 minutes' walk round trip to collect* | 1/10 |
| | L3 | Does not have access to adequate sanitation<br>*Adequate sanitation: toilet facility is flush/pour, composting, pit latrine with slab & pipe (VIP); & not shared with other households* | 1/10 |
| | L4 | Has a dirt floor | 1/10 |
| | L5 | No household member has employment which involves non-vulnerable work<br>*Non-vulnerable work: a job working for someone else outside the family or for themselves in a business that is not working on own land* | 1/10 |
| | L6 | Owns few assets<br>*Does not own more than one of these assets:*<br>*bicycle, motorbike,[20] radio, fridge, phone, TV, large animal & does not own a car or truck* | 1/10 |
| | | **Total:** | 10/10 |

Table 8.4.2 shows the rates of multidimensional poverty by location for all households with children 0-59 months – due to the nature of component H1, only households aged 0-59 months can be deprived

[19] https://drive.google.com/file/d/0BxiFT7ChCZQqM3FLQ2NKTlBOYWc/view
[20] Unfortunately ownership of a motorbike was not included in the Aileu BFBH baseline survey. This will need to be considered when making future comparisons.

in this component area, hence the sample was restricted to this group in the Study to ensure comparability across municipalities (the Aileu sample having a larger proportion of households without children 0-59 months).

MPI-poverty rates varied across locations, largely reflecting the disparities in living conditions across locations. The MPI-poverty rate is highest in Aileu project areas (51%) and lowest in Baucau (30%). These overall rates are quite low compared to the most recent MPI-poverty figure of 62% for Timor-Leste in 2010 (Cornwell et al., 2015).

For all locations except Cova Lima, the MPI-poverty rate among households in project areas is much higher than that in comparison locations: 26 percentage points lower in Aileu comparison areas, 9 percentage points lower in Baucau, 17 percentage points lower in Bobonaro and 9 percentage points higher in Cova Lima comparison areas.

**Table 8.4.2**
**Multidimensional Poverty (MPI) Status**

| | % Households in MPI-Poverty | | MPI Status of Households with a Female Head | | MPI Status of Households with a PWD | |
|---|---|---|---|---|---|---|
| | % | n | % | n | % | n |
| **Project areas:** | | | | | | |
| Aileu | 51.3% | 298 | 58.3% | 24 | 45.0% | 40 |
| Baucau | | | | | | |
| with TOMAK | 33.3% | 180 | 30.0% | 10 | 36.4% | 33 |
| without TOMAK | 28.0% | 254 | 15.4% | 13 | 41.4% | 29 |
| total Baucau | 30.2% | 434 | 21.7% | 23 | 38.7% | 62 |
| Bobonaro | 42.5% | 299 | 46.7% | 15 | 46.5% | 43 |
| Cova Lima | 43.4% | 244 | 33.3% | 6 | 42.9% | 35 |
| **Comparison areas:** | | | | | | |
| Aileu | 24.5% | 102 | 100.0% | 6 | 77.8% | 9 |
| Baucau | | | | | | |
| with TOMAK | 19.7% | 117 | 0.0% | 2 | 11.1% | 9 |
| without TOMAK | 24.0% | 104 | 80.0% | 5 | 35.7% | 14 |
| total Baucau | 21.7% | 221 | 57.1% | 7 | 26.1% | 23 |
| Bobonaro | 25.8% | 128 | 66.7% | 6 | 50.0% | 6 |
| Cova Lima | 52.7% | 93 | 100.0% | 1 | 58.3% | 12 |

While Table 8.4.2 presents rates among households nominating a female as head of household and among households with a PLWD, the sample size for these was too small to draw any conclusion regarding MPI poverty status of these households compared to the overall sample.

## 8.5 Agricultural Production

Agricultural Households[21] in Aileu project areas were most likely to grow crops (90%), followed by households in Cova Lima (86%), Bobonaro (80%) and then Baucau (74%). Comparison areas had a similar profile, except for Bobonaro where only 67% of households harvested agricultural product in the 12 months prior to the survey. (Refer to Table 8.5)

In Aileu project areas, a moderate number of households are growing soybeans (16%), red kidney beans (23%) and orange sweet potato (24%). Virtually no households were found to grow moringa and no households grew mung beans. In Baucau project areas, virtually no households grew BFBH 'superfoods'. In Bobonaro project areas 'superfoods' are commonly grown: 65% grew moringa, 47% mung beans, 11% orange sweet potato, 4% red kidney beans and 3% soybeans. In Cova Lima 23% grew moringa but other 'superfood' crops were rarely grown. In comparison areas, 'superfood' crop production tended to be lower than that of the project areas in the same municipality. (Refer to Table 8.5)

More than 80% of households grew maize / corn, and a moderate to large proportion harvest cassava. On average, rice is more common in all municipalities except Bobonaro project areas and Aileu comparison areas whose agro-geographic climate tends to be less conducive to growing the crop.

In Aileu, green leafy vegetables are commonly grown (37% project, 42% comparison), as well as coffee (25% project and 17% comparison) and a range of tubers (white/purple sweet potato 18 and 20%; taro/local tubers 24 and 36%). Green leafy vegetables are also commonly grown in Bobonaro (28 and 21%) and Cova Lima (30 and 36%), as are bananas (Bobonaro 30 and 18%, Cova Lima 28% and 37%). Papaya and pumpkin are common in Baucau, Bobonaro and Cova Lima. Households in Baucau tend to grow a more varied crop mix, including tomato (27 and 24%), cucumber (23% and 41%), peanut (23 and 16%) and green beans (22 and 14%). Meanwhile eggplant (24% and 17%) and coconut (13% and 21%) can be found in Cova Lima, and betel nut is grown by 20% of Bobonaro project area households. (Refer to Table 7.5)

[21] Households who reported they grew crops or harvested agricultural produce in the last 12 months.

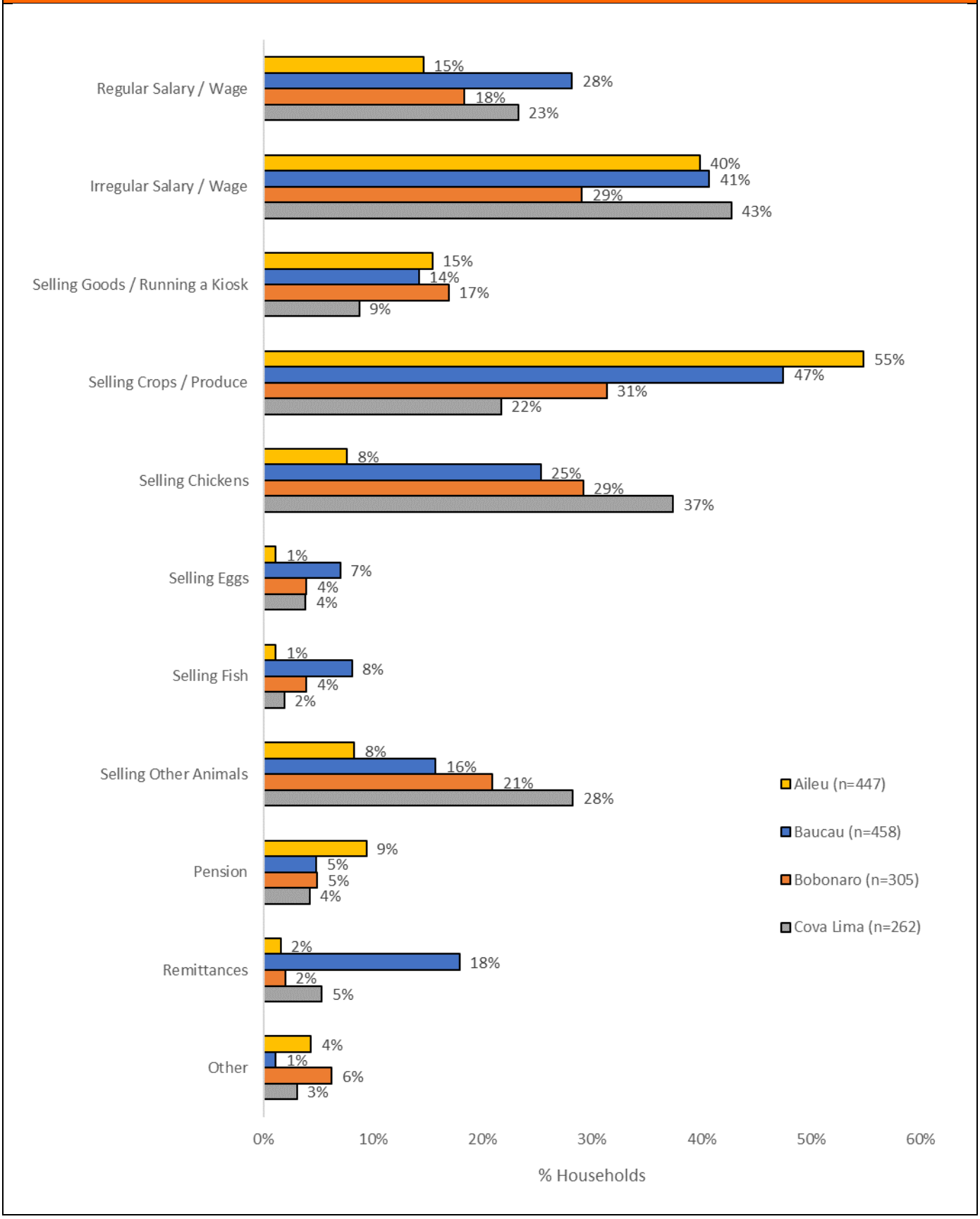
| Table 7.5<br>Household Engagement in Agriculture | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Project Areas | | | | | | Comparison Areas | | | | | |
| | Aileu | Baucau with TOMAK | Baucau without TOMAK | Baucau total | Bobonaro | Cova Lima | Aileu | Baucau with TOMAK | Baucau without TOMAK | Baucau total | Bobonaro | Cova Lima |
| Agricultural households | 89.9% | 78.5% | 70.4% | 73.8% | 79.9% | 85.9% | 93.0% | 75.6% | 74.5% | 75.1% | 66.9% | 87.9% |
| N | 447 | 191 | 267 | 458 | 308 | 262 | 143 | 123 | 106 | 229 | 133 | 99 |
| Crops grown among agricultural households: | | | | | | | | | | | | |
| BFBH Superfoods: | | | | | | | | | | | | |
| Soybeans | 16.2% | 0.0% | 0.0% | 0.0% | 2.9% | 0.9% | 6.0% | 0.0% | 2.5% | 1.2% | 2.2% | 0.0% |
| Mung beans | 0.0% | 0.0% | 0.0% | 0.0% | 46.5% | 3.6% | 0.0% | 0.0% | 2.5% | 1.2% | 23.6% | 3.4% |
| Red kidney beans | 22.6% | 0.0% | 0.0% | 0.0% | 4.1% | 0.4% | 10.5% | 0.0% | 1.1% | 0.6% | 1.1% | 0.0% |
| Orange sweet potato | 24.4% | 0.7% | 0.5% | 0.6% | 10.6% | 1.3% | 26.3% | 5.4% | 6.3% | 5.8% | 1.1% | 0.0% |
| Moringa | 0.3% | 1.3% | 0.5% | 0.9% | 65.4% | 22.7% | 1.5% | 5.1% | 1.1% | 2.9% | 51.7% | 8.0% |
| Staples and starches | | | | | | | | | | | | |
| Cassava | 40.0% | 42.0% | 30.9% | 35.8% | 71.5% | 66.7% | 54.1% | 65.6% | 35.4% | 51.7% | 65.2% | 82.8% |
| Corn | 89.6% | 98.7% | 83.0% | 89.9% | 96.7% | 86.7% | 93.2% | 96.8% | 84.8% | 91.3% | 88.8% | 89.7% |
| Potato | 2.5% | 3.3% | 2.7% | 3.0% | 0.8% | 2.7% | 3.0% | 12.9% | 6.3% | 9.9% | 0.0% | 9.2% |
| Rice | 35.1% | 29.3% | 27.7% | 28.4% | 6.1% | 31.6% | 8.3% | 24.7% | 32.9% | 28.5% | 29.2% | 23.0% |
| Sweet potato – white or purple | 18.4% | 9.3% | 4.3% | 6.5% | 13.8% | 2.7% | 20.3% | 17.2% | 5.1% | 11.6% | 3.4% | 2.3% |
| Taro / local tubers | 23.6% | 12.7% | 6.9% | 9.5% | 7.3% | 8.9% | 36.1% | 26.9% | 6.3% | 17.4% | 4.5% | 6.9% |
| Vegetables | | | | | | | | | | | | |
| Bitter gourd | 1.0% | 10.0% | 5.9% | 7.7% | 11.8% | 17.3% | 0.8% | 5.4% | 17.7% | 11.0% | 6.7% | 10.3% |
| Carrot | 0.5% | 0.7% | 0.0% | 0.3% | 0.8% | 0.4% | 0.0% | 3.2% | 1.3% | 2.3% | 1.1% | 0.0% |
| Cucumber | 1.2% | 24.0% | 23.4% | 23.7% | 10.6% | 0.0% | 12.0% | 50.5% | 29.1% | 40.7% | 2.2% | 0.0% |
| Eggplant | 2.5% | 8.0% | 9.0% | 8.6% | 6.5% | 24.0% | 0.8% | 4.3% | 11.4% | 7.6% | 4.5% | 17.2% |
| Green leafy vegetables | 37.1% | 15.3% | 9.6% | 12.1% | 27.6% | 29.8% | 42.1% | 19.4% | 20.3% | 19.8% | 21.3% | 35.6% |
| Onion / garlic | 2.7% | 7.3% | 2.1% | 4.4% | 0.8% | 0.4% | 5.3% | 0.0% | 7.6% | 3.5% | 0.0% | 0.0% |
| Pumpkin | 7.0% | 58.7% | 47.9% | 52.7% | 53.3% | 32.9% | 17.3% | 64.5% | 62.0% | 63.4% | 37.1% | 34.5% |
| Tomato | 3.2% | 15.3% | 35.6% | 26.6% | 13.0% | 5.8% | 3.8% | 25.8% | 22.8% | 24.4% | 6.7% | 6.9% |

| Table 7.5 (continued)<br>Household Engagement in Agriculture | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Project Areas | | | | | | Comparison Areas | | | | | |
| | Aileu | with TOMAK | Baucau without TOMAK | total Baucau | Bobonaro | Cova Lima | Aileu | with TOMAK | Baucau without TOMAK | total Baucau | Bobonaro | Cova Lima |
| Crops grown among agricultural households: | | | | | | | | | | | | |
| Fruits | | | | | | | | | | | | |
| Avocado | 0.0% | 2.0% | 0.5% | 1.2% | 2.4% | 0.4% | 0.8% | 1.1% | 1.3% | 1.2% | 0.0% | 0.0% |
| Banana | 10.2% | 15.3% | 9.0% | 11.8% | 30.1% | 27.6% | 16.5% | 23.7% | 12.7% | 18.6% | 18.0% | 36.8% |
| Coconut | 0.0% | 11.3% | 6.4% | 8.6% | 15.0% | 12.9% | 3.0% | 12.9% | 6.3% | 9.9% | 5.6% | 20.7% |
| Guava | 0.7% | 2.7% | 0.0% | 1.2% | 13.0% | 4.0% | 2.3% | 3.2% | 1.3% | 2.3% | 0.0% | 1.1% |
| Green beans | 7.7% | 24.7% | 20.2% | 22.2% | 15.9% | 3.1% | 9.0% | 22.6% | 15.2% | 19.2% | 13.5% | 2.3% |
| Jackfruit / breadfruit | 0.5% | 6.0% | 0.5% | 3.0% | 1.6% | 1.8% | 0.8% | 2.2% | 7.6% | 4.7% | 1.1% | 1.1% |
| Jambua (pomelo) | 0.0% | 1.3% | 0.5% | 0.9% | 4.5% | 0.4% | 0.8% | 3.2% | 1.3% | 2.3% | 0.0% | 0.0% |
| Lemon | 0.7% | 4.7% | 1.1% | 2.7% | 7.7% | 1.3% | 0.0% | 2.2% | 5.1% | 3.5% | 1.1% | 1.1% |
| Mango | 0.5% | 2.7% | 0.5% | 1.5% | 15.9% | 6.2% | 0.8% | 2.2% | 2.5% | 2.3% | 11.2% | 1.1% |
| Orange | 1.5% | 2.7% | 1.6% | 2.1% | 7.7% | 1.8% | 3.0% | 3.2% | 0.0% | 1.7% | 1.1% | 0.0% |
| Papaya | 8.7% | 40.0% | 23.4% | 30.8% | 47.6% | 46.2% | 9.0% | 38.7% | 31.6% | 35.5% | 29.2% | 44.8% |
| Pineapple | 1.0% | 1.3% | 0.5% | 0.9% | 0.0% | 2.2% | 0.0% | 1.1% | 1.3% | 1.2% | 1.1% | 0.0% |
| Nuts and legumes | | | | | | | | | | | | |
| Cashew | 0.5% | 0.7% | 0.0% | 0.3% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 3.4% | 0.0% |
| Cowpea | 8.2% | 7.3% | 1.6% | 4.1% | 17.1% | 2.7% | 15.8% | 6.5% | 3.8% | 5.2% | 9.0% | 4.6% |
| Peanut | 1.2% | 20.7% | 25.5% | 23.4% | 13.8% | 11.6% | 1.5% | 19.4% | 12.7% | 16.3% | 12.4% | 9.2% |
| Others | | | | | | | | | | | | |
| Betel nut | 0.2% | 4.0% | 0.0% | 1.8% | 20.3% | 0.9% | 3.0% | 0.0% | 1.3% | 0.6% | 1.1% | 0.0% |
| Coffee | 25.1% | 0.7% | 0.0% | 0.3% | 0.4% | 0.0% | 17.3% | 0.0% | 0.0% | 0.0% | 2.2% | 0.0% |
| Ginger | 1.0% | 7.3% | 1.6% | 4.1% | 4.5% | 2.7% | 1.5% | 3.2% | 3.8% | 3.5% | 2.2% | 2.3% |
| Palm nut | 0.0% | 4.7% | 0.0% | 2.1% | 9.8% | 0.9% | 2.3% | 2.2% | 1.3% | 1.7% | 2.2% | 1.1% |
| N | 402 | 150 | 188 | 338 | 246 | 225 | 133 | 93 | 79 | 172 | 89 | 87 |

## 8.6 Sources of Household Income

In general, the most common source of household income was from selling crops or produce that households have grown themselves, followed by irregular salary / daily wage (for example, piece work on other people's land or work on government projects such as building roads), regular salary or wage work or selling chickens or livestock. Sources of income varied across locations, with households in Aileu most likely to earn income from selling crops or produce (55%), and households in Cova Lima most likely to earn income from irregular salary / daily wage (43%) and selling chickens (37%) and other animals (28%). Households in Baucau appear to have more varied sources of income, with large proportions earning income across all source categories, and a notably large proportion receiving remittances – 18% compared to less than 5% in other municipalities. Kiosks and small business are run by some households (9-17%) – a common sight in rural Timor-Leste is a kiosk run from a window of the family home, usually by female household members. (Refer to Figure 8.6)

**Figure 8.6**
**Sources of Household Income**



# 9. Results for Project Goal and Outcome Indicators

This section presents the summary results for each of the goal and outcome indicators relevant at baseline. For some aspects relating to health, nutrition and gender, data is analysed in more depth to present a more complete story of the current behaviours and practices in project communities at baseline. The ITT in Annex 6 provides the full table of indicator values and their definitions. The Annex also provides results disaggregated by sex and disability (where applicable), project and comparison areas, and for Baucau municipality, TOMAK implementation status. Specific sample sizes used in calculating indicator values are also provided in order to later calculate significance tests for project impact.

## 9.1 Project Goal: Children under 5 and their mothers are well nourished

Goal-level indicators for the project relate to reducing the incidence of malnutrition (specifically, stunting, wasting and underweight in children, and thinness in mothers and pregnant women), diarrhoea, anaemia and gender-equal attitudes and decision-making. Unfortunately, anaemia testing was only conducted in the expansion municipalities (Baucau, Bobonaro and Cova Lima) due to delays in receiving ethics clearance before the end of the 2016 ANCP financial year and the commencement of the baseline in the Aileu pilot area. While anaemia status could have been collected in Alieu at a later date, the cost and usefulness of obtaining this data after project activities had started outweighed any rationale for undertaking this data collection. Testing for anaemia, however will take place at endline in Aileu and assessment of change will be inferred through scaling the 2016 DHS prevalence rates for Ailieu by the changes observed in the expansion districts.

**Project Goal:**

**Children under 5 and their mothers are well nourished**

G.1. % stunting in children 0-59 months (length/height for age) (CIA.0008).
G.2.1. % wasting in children 0-59 months (weight for height).
G.2.2. % wasting in children 6-59 months (MUAC)
G.2.3. % thinness in mothers of children 0-59 months (MUAC).
G.2.4. % thinness in pregnant women (MUAC).
G.3. % underweight in children 0-59 months (weight for age).
G.4. % diarrhoea in children 0-59 months.
G.5.1. % anaemia in children 0-59 months (not collected in Aileu).
G.5.2. % anaemia in mothers of children 0-59 months (not collected in Aileu).
G.5.3. % anaemia in pregnant women (not collected in Aileu).
G.5.4. % people in agreement with key gender attitude statements.
G.5.5. % households where women or men and women jointly make key health and nutrition related decisions.

## Children (aged 0-59 months)

For almost all indicators the prevalence of undernutrition reflects what the WHO classifies as the highest public health concern.[22] Aileu recorded the highest prevalence of stunting[23] among children at 53% (n=277) compared to 45% (n=407), 46% (n=285) and 46% (n=231) in Baucau, Bobonaro and Cova Lima project areas respectively. These prevalence rates are in line with the national average in rural areas of 47% observed in the 2016 DHS, and all are regarded by the WHO as a "very high public health problem" (the highest category). Wasting[24] was lower than the DHS national rural average (25%) in all four BFBH project locations, with rates lowest in Aileu at 11% (n=279) and highest in Cova Lima at 23% (n=231); the prevalence of wasting measured using the alternative middle-upper-arm circumference (MUAC),[25] were quite similar to the prevalence of wasting using weight-for-height although appear more consistent across project area locations (refer to Figure 9.1.1). A prevalence of above 15% is classified as a "critical public health problem" by the WHO.

The prevalence of underweight, defined as weight for age less than two standard deviations below the WHO growth reference and representing the composite of chronic malnutrition (indicated by stunting) and acute malnutrition (indicated by wasting), ranged from 34% (Aileu, n=283) to 47% (Bobonaro, n=293) and on average are in line with the 2016 DHS rural national average of 43%. These are also in the WHO's most severe category "very high public health problem".

Reported incidence of diarrhoea in the two weeks prior to the survey varied substantially by municipality, with Aileu at 8% (n=296), Baucau at 22% (n=432), Bobonaro at 33% (n=297) and Cova Lima at 30% (n=243). (Refer to Figure 9.1.1) The high incidence rates in Bacau and Bobonaro are much higher than the 9% incidence rate reported for children (aged 0-59 months) living in rural Timor-Leste in the 2016 DHS. Differences across locations and in comparison to the DHS may reflect differences in timing of the data collection.

The prevalence of any anaemia, defined as Hb<110g/L observed among children in Bobonaro (39%, n=289) and Cova Lima (50%, n=238) was similar to the 40% rural national average observed in the 2016 DHS[26]. The prevalence of anaemia n Baucau was much higher than at 68%. (Refer to Figure 9.1.1) The WHO classifies a prevalence of above 40% a 'severe public health problem' (highest problem category). In the sections to follow we explore differences in the types of food consumed by location which may provide some rationale for why the prevalence of anaemia is so high in the Baucau project areas.

[22] http://www.who.int/nutrition/nlis_interpretation_guide.pdf
[23] Height for age less than 2 standard deviations below the WHO growth reference.
[24] Weight for height less than 2 standard deviations below the WHO growth reference.
[25] MUAC less than 12.5cm.
[26] DHS prevalence rates are based on children aged 6-59 months while rates in the BFBH baseline are based on children 0-59 months. Prevalence rates are very similar when the BFBH sample is restricted to children 6-59 months.

### Mothers of children 0-59 months and pregnant women

The first two indicators refer to the prevalence of thinness for mothers of children 0-59 months and pregnant women using MUAC measurements.[27] The prevalence of thinness varied substantially by location, with the highest rate observed in Aileu (63% of mothers, n=240; and 64% of pregnant women, n=28) and Bobonaro (65%, n=266 and 67%, n=27). (Refer to Figure 9.1.2). The prevalence in Baucau (38% for mothers, n=405; and 50% for pregnant women, n=54) and Cova Lima (48%, n=242 and 47%, n=36) were lower than those observed in Bobonaro and Aileu but still a lot higher than the 28% of women of reproductive age (WRA) (aged 15-49 years) classified as thin (BMI<18.5kg/$m^2$), reported by the 2016 DHS for WRA living in rural areas.

The prevalence of anaemia among mothers of children 0-59 months (Hb<120g/L for non-pregnant women and Hb<110g/L for pregnant women) was highest in Baucau (45%, n=412) and Cova Lima (43%, n=238) compared to Bobonaro (24%, n=293). The prevalence in Baucau and Cova Lima was much higher than the 22% prevalence among WRA living in rural areas in Timor-Leste in the 2016 DHS. Similarly, the prevalence of anaemia among pregnant women (Hb<120g/L) was higher than the DHS national average[28] of 37% in Baucau (64%, n=55) and Cova Lima (56%, n=36) but on par with the national average in Bobonaro (41%, n=27).

[27] Thinness defined as MUAC <23.5cm.
[28] Rural average for pregnant women was not published in the DHS (2016) report.

**Figure 9.1.1**
**Child Health and Nutrition Indicators at Goal Level**

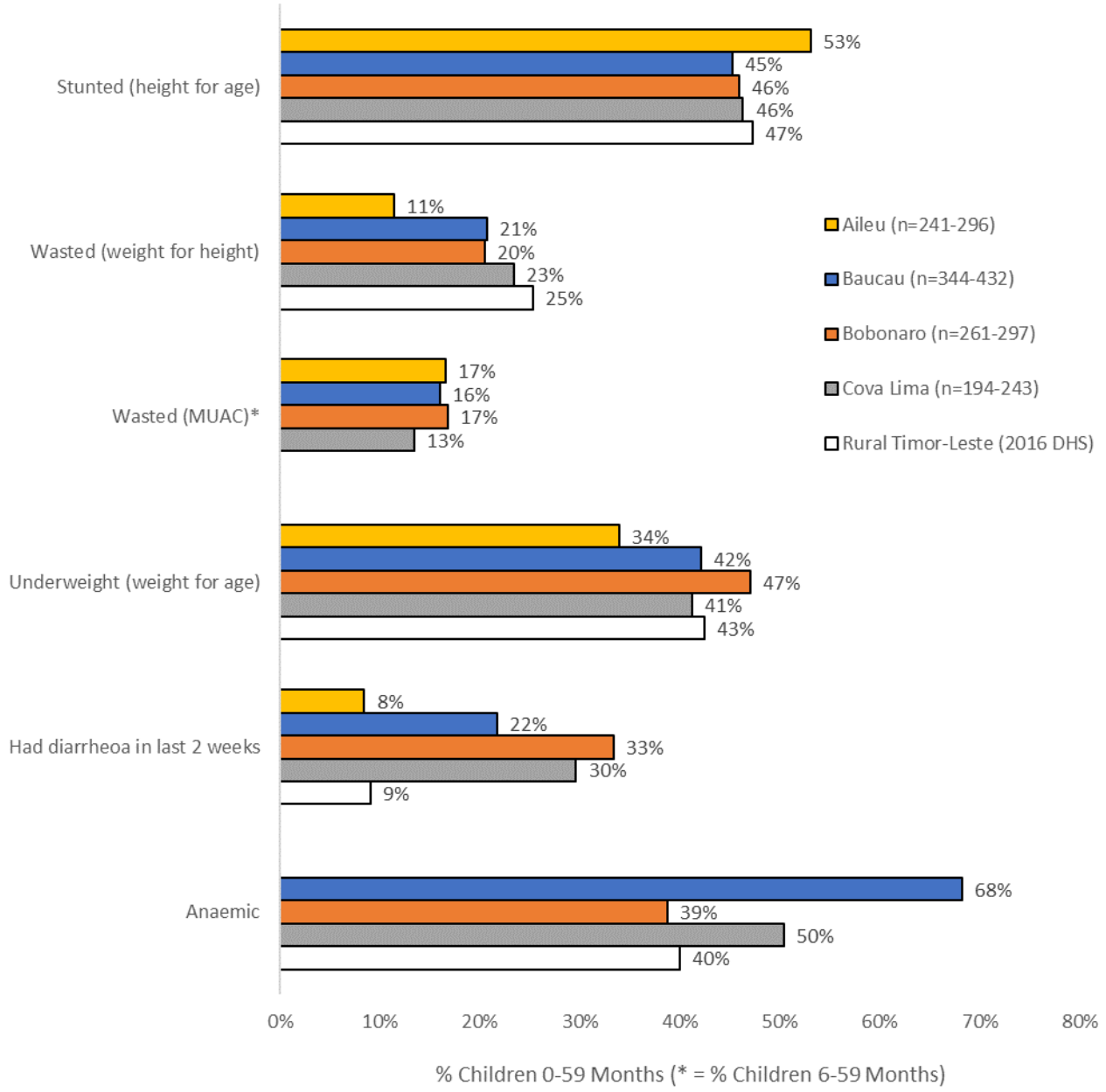


**Figure 9.1.2**
**Adult-Level Indicators at Goal Level**

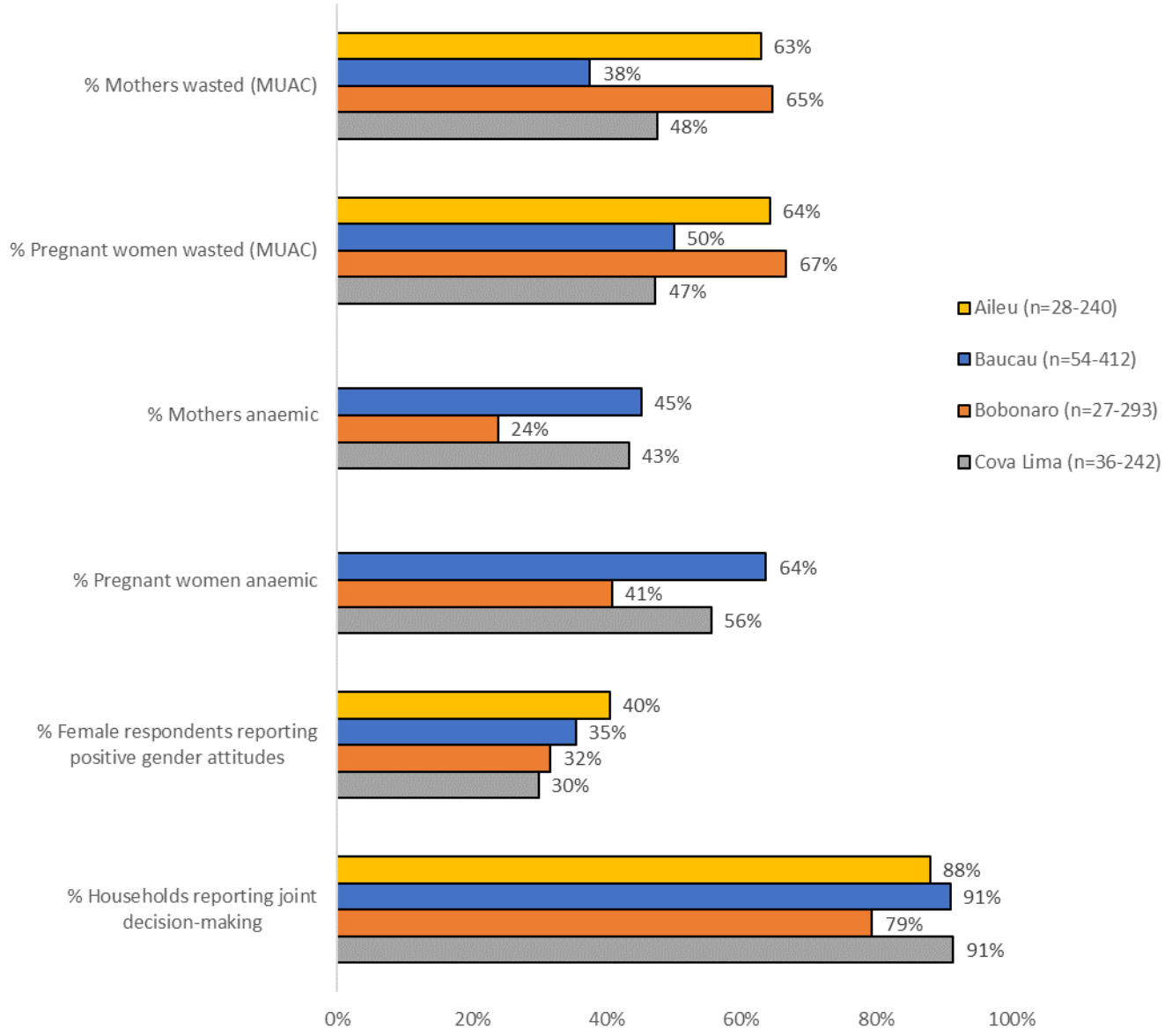
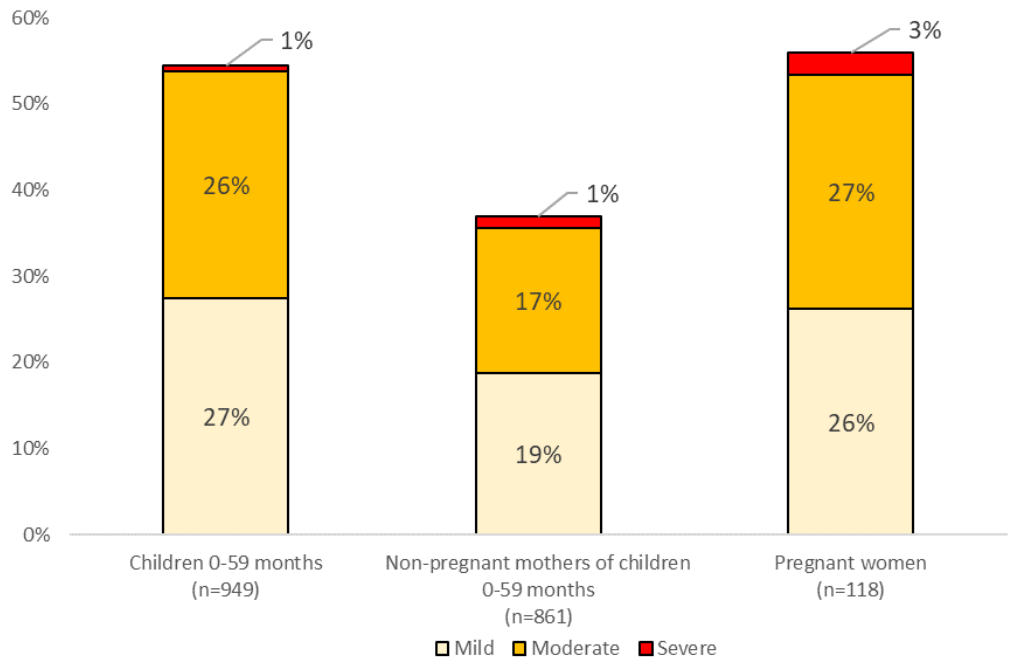



Figure 9.1.3 shows the degree of anaemia (mild, moderate and severe)[29] among children 0-59 months, mothers of children 0-59 months and pregnant women in project areas. While prevalence rates of (any) anaemia are high in the sample, there were very few cases of severe anaemia observed. Notably, a large proportion of the sample sits just below the respective cut-off for anaemia – 27% of children, 19% of non-pregnant mothers and 26% of pregnant women have haemoglobin concentrations classified as 'mild anaemia'. Despite the comfort this result might provide, it nonetheless highlights an urgency in addressing the issue of anaemia to ensure those sitting on the cusp do not fall behind, and those just below do not fall further behind. It also suggests that improvements in anaemia rates may be possible with even small improvements in the consumption of iron-rich foods.

[29] Children 0-59 months and pregnant women: mild 100-109g/L; moderate 70-99g/L; severe <70g/L. Non-pregnant women: mild 110-119g/L; moderate 80-109g/L; severe <80g/L.
http://www.who.int/vmnis/indicators/haemoglobin.pdf

**Figure 9.1.3**
**Mild, Moderate and Severe Anaemia**
**Children, Mothers and Pregnant Women in Project Areas**




The final two goal-level indicators relate to gender attitudes and decision-making. The gender attitudes indicator is defined as the average proportion of gender-positive responses to a set of 10 gender attitude statements as follows:

**Table 9.1**
**Gender Attitude Statements**

| Gender Attitude Statement | | Gender-Positive Response: |
|---|---|---|
| 1. | Men must make the final decision about how the household's money is spent | disagree |
| 2. | It is natural that men hold the power in the household | disagree |
| 3. | Looking after house and home is a woman's responsibility | disagree |
| 4. | It is appropriate for women to work outside the home | agree |
| 5. | There are times when a woman deserves to be beaten | disagree |
| 6. | Women must tolerate violence to keep the family together | disagree |
| 7. | If a husband beats his wife, others in the community must intervene | agree |
| 8. | It is normal and acceptable for men to harass women in the street | disagree |
| 9. | Women are better than men at looking after children | disagree |
| 10. | I can make decisions that are important to me - where I go, who I see, etc | agree |

Since there were few male respondents in the Baucau, Bobonaro and Cova Lima sample, the indicator is defined over only female respondents to make comparisons across municipalities possible. That is, on average, women in Aileu project areas responded gender-positive to 40% or 4 out of 10 statements (n=386). In Baucau the average was 35% (3.5 out of 10, n=456), Bobonaro 32% (n=305) and Cova Lima 30% (n=263).

In Figure 9.1.4 we exploit the fact that the Aileu sample includes a larger number of male respondents to explore the breakdown of responses to each statement by sex of the respondent.

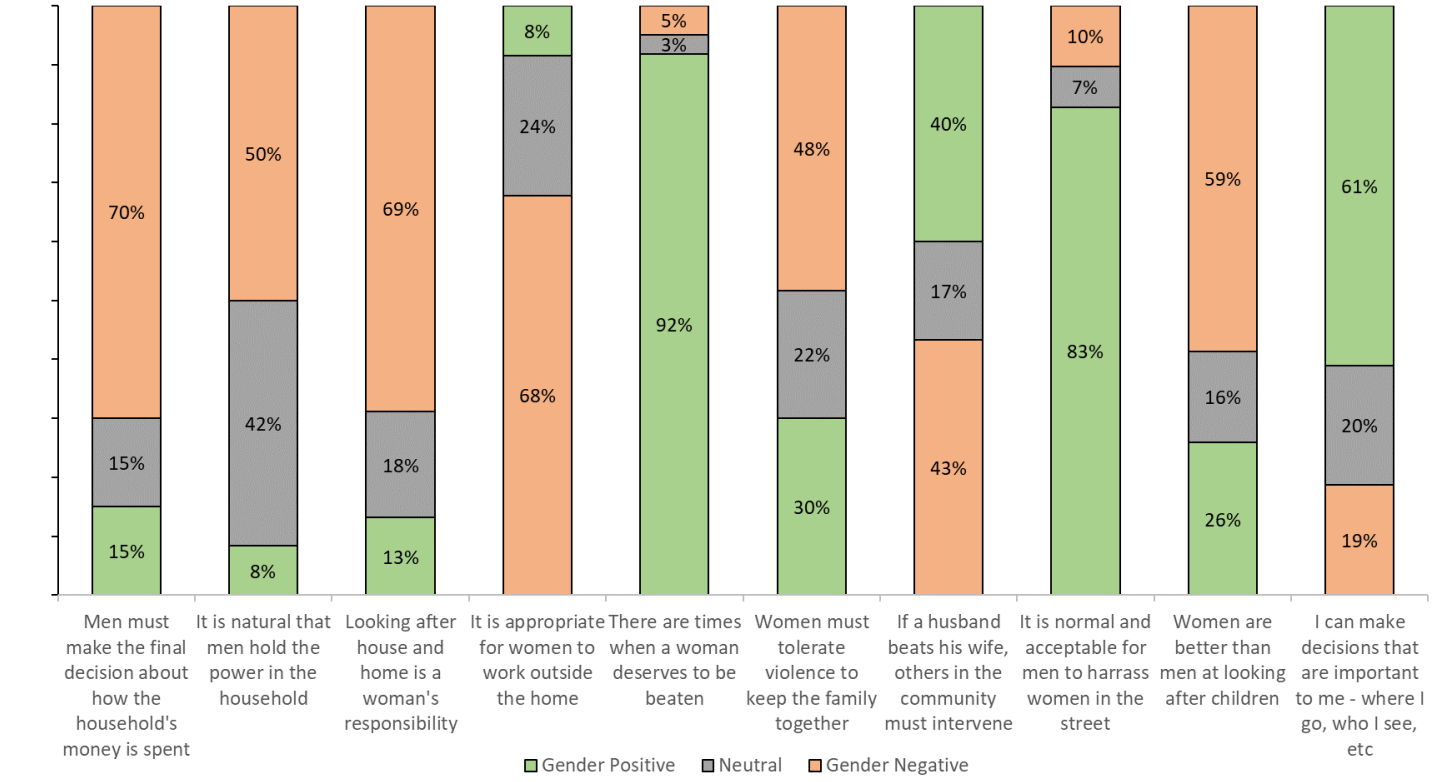
The first four statements relate to traditional gender roles: that men are the final decision-makers and hold the power in the household, while women are responsible for the home and should not work outside. Results for both men and women show a strong agreement with these traditional gender roles, and the view is stronger among male respondents. Both male and female respondents tended to agree that women are better at looking after children than men.

Responses to domestic violence-related questions are quite striking: almost all respondents disagree that there are times when a woman deserves to be beaten, and the vast majority disagree that harassment is normal and acceptable. Yet the majority also agree that women should tolerate violence to keep the family together – with male respondents again more likely to report agreement with this statement.

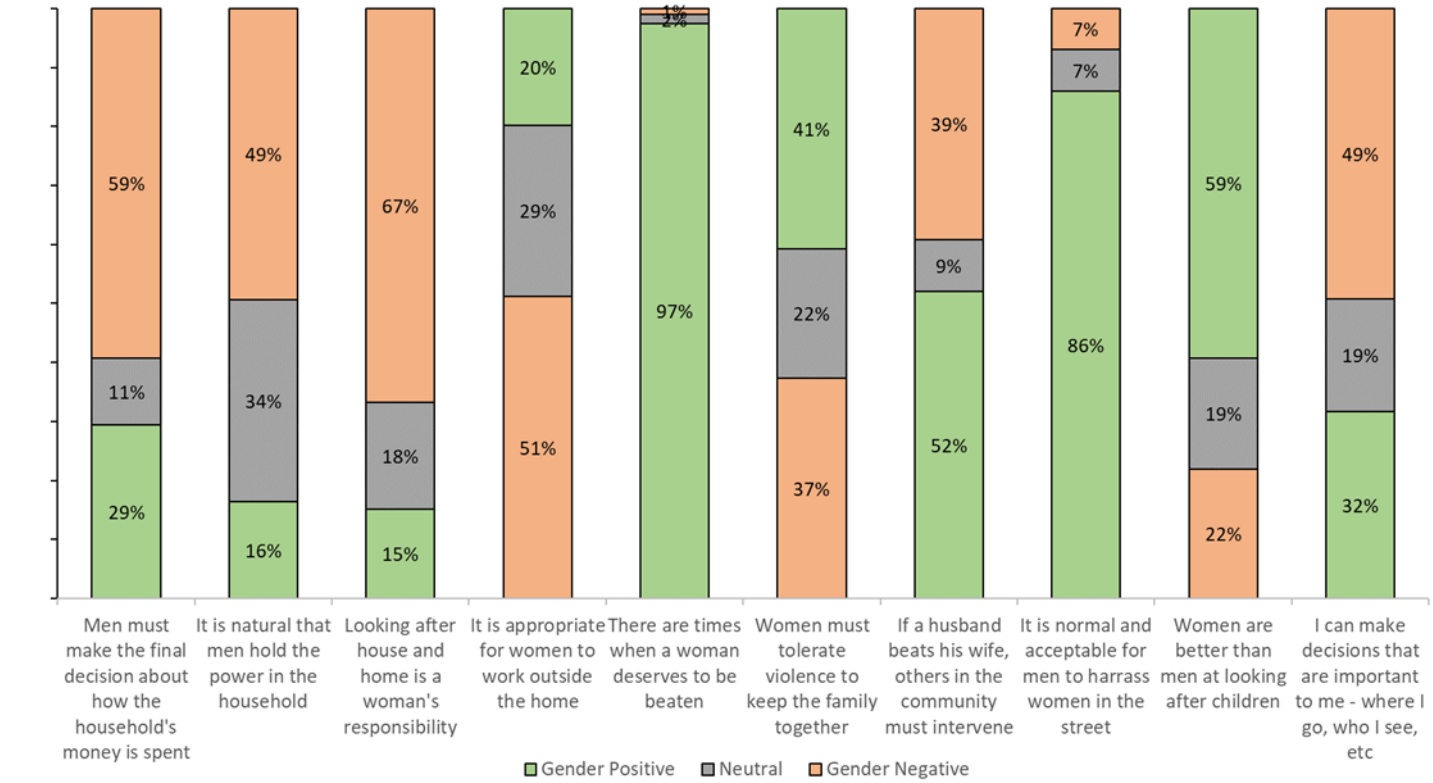
The final statement relates to one's sense of ability to make their own decisions. The majority of respondents agreed with this statement, with male respondents more likely to agree than female respondents.

**Figure 9.1.4**
**Responses to Gender Attitude Statements by Sex of the Respondent**
**Aileu Project Areas**

(a) Male Respondents (n=61)




(b) Female Respondents (n=386)



The indicator relating to joint decision-making in the household is defined over all households in the baseline sample. The set of six household decisions are:

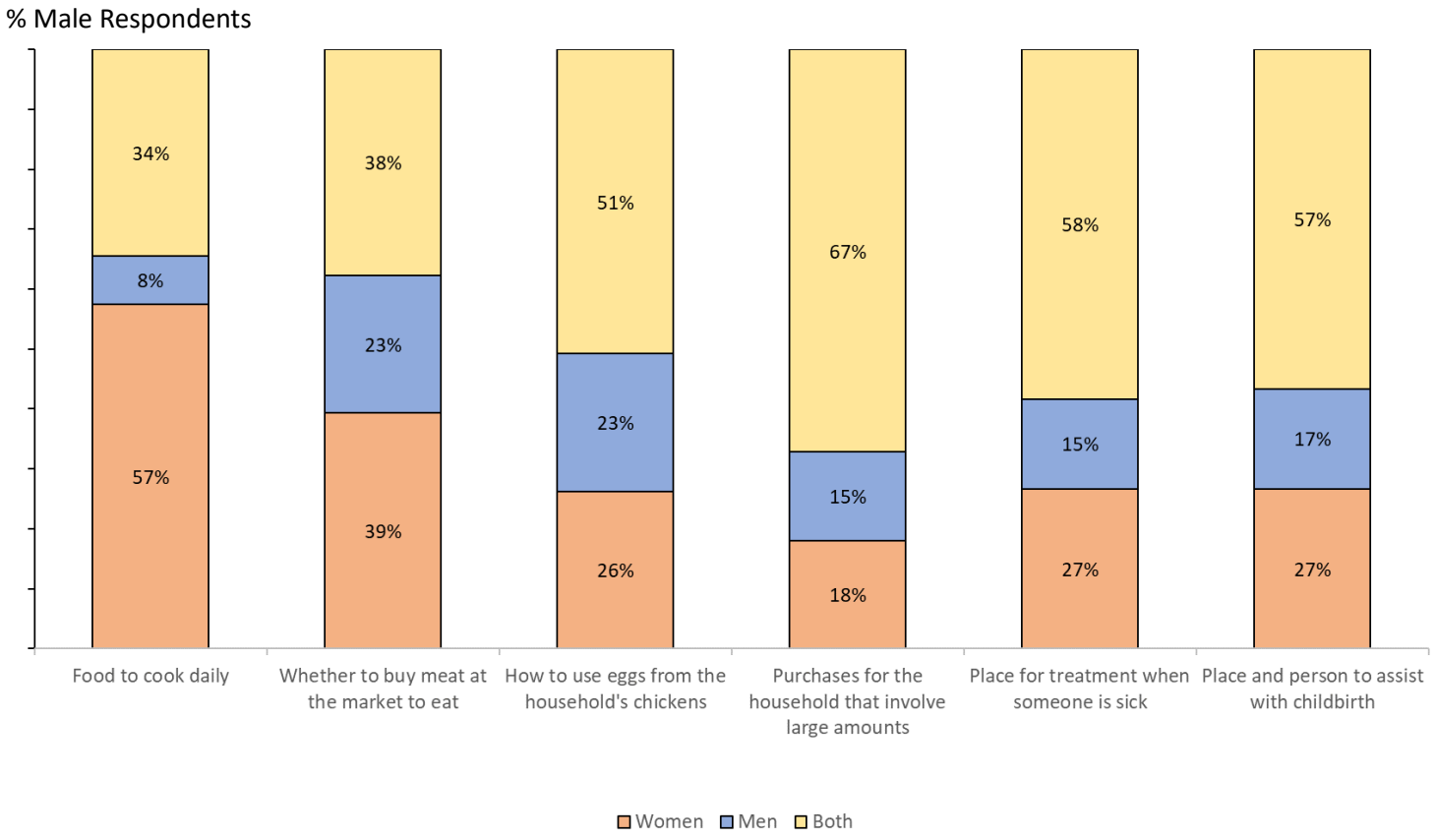
1. What food to cook daily
2. Whether to buy meat at the market to eat
3. How to use eggs from the household's chickens
4. Purchases for the household that involve large amounts
5. Place for treatment when someone is sick
6. Place and person to assist with childbirth

The indicator is defined as the average proportion of decisions where the usual decision is made either by a female member, or a male and female household member jointly. That is, in Aileu on average 88% (n=447) of the six decisions are reported to be made by a female member or a male and female jointly. In Baucau, 91% (n=458) of the decisions are made by women or jointly, Bobonaro 79% (n=308) and Cova Lima 91% (n=263). These high reported rates suggest that the vast majority of household-related decision-making is made by the woman or the man and woman together.

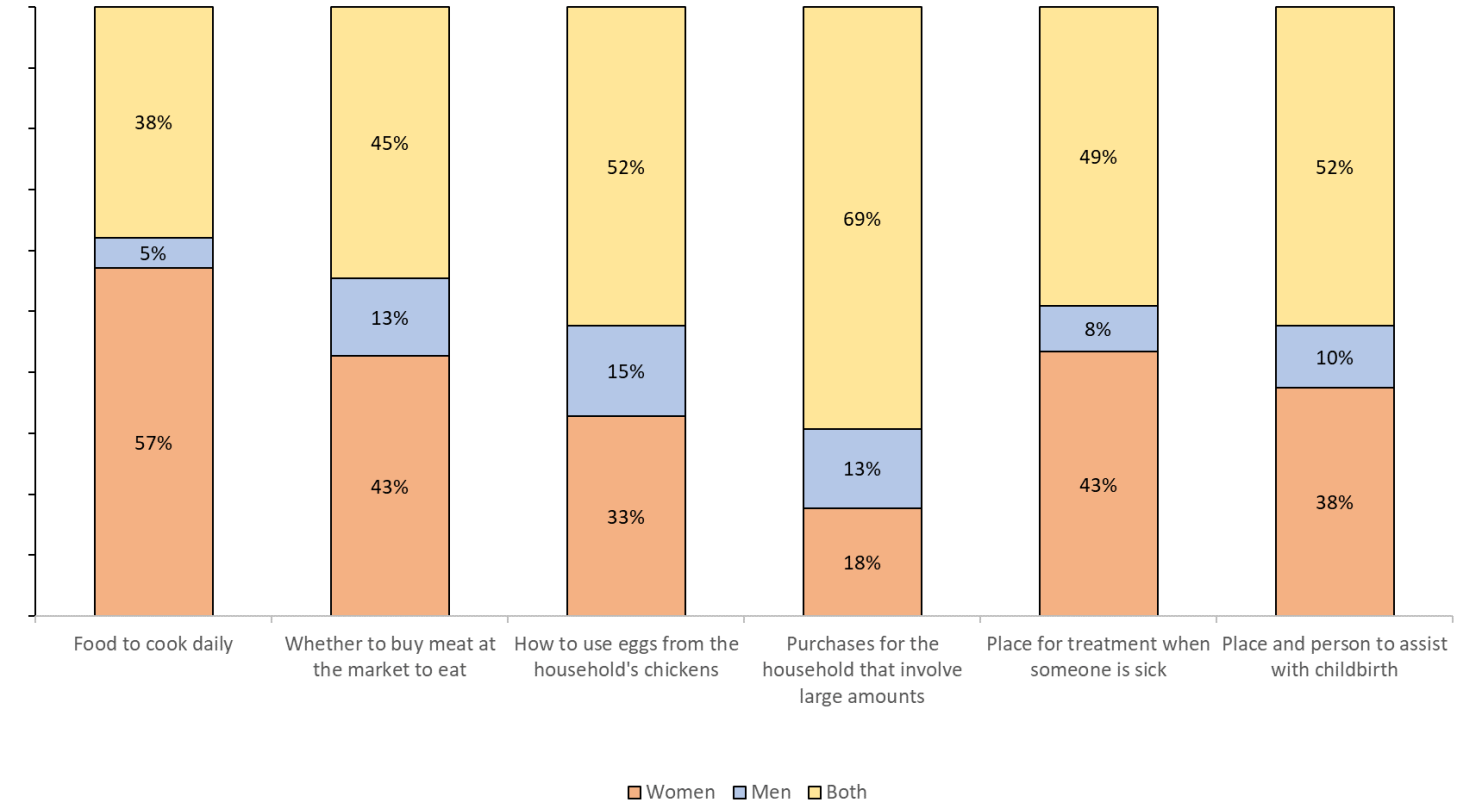
Figure 9.1.5 breaks down the results by decision and sex of the respondent for the project-area sample in Aileu. Here we see some gender differences in the individual decisions: around 95% of respondents in project areas reported women being involved in the decision around what foods to cook daily – either jointly with men or women alone. Men are reported to be more involved in the decision whether to buy meat at the market to eat, and in the use for eggs collected from the household's chickens. Women alone are less involved in decisions regarding large household expenditures, with most reporting it as a decision made jointly. With the exception of decisions regarding which foods to cook daily, joint male-female decisions are the dominant response. Male respondents tend to report men as the sole decision-maker more than female respondents, and vice-versa for female respondents.

**Figure 9.1.5**
**Usual Decision Maker in Household Decisions**

(a) Male Respondents in Project Areas (n=61)

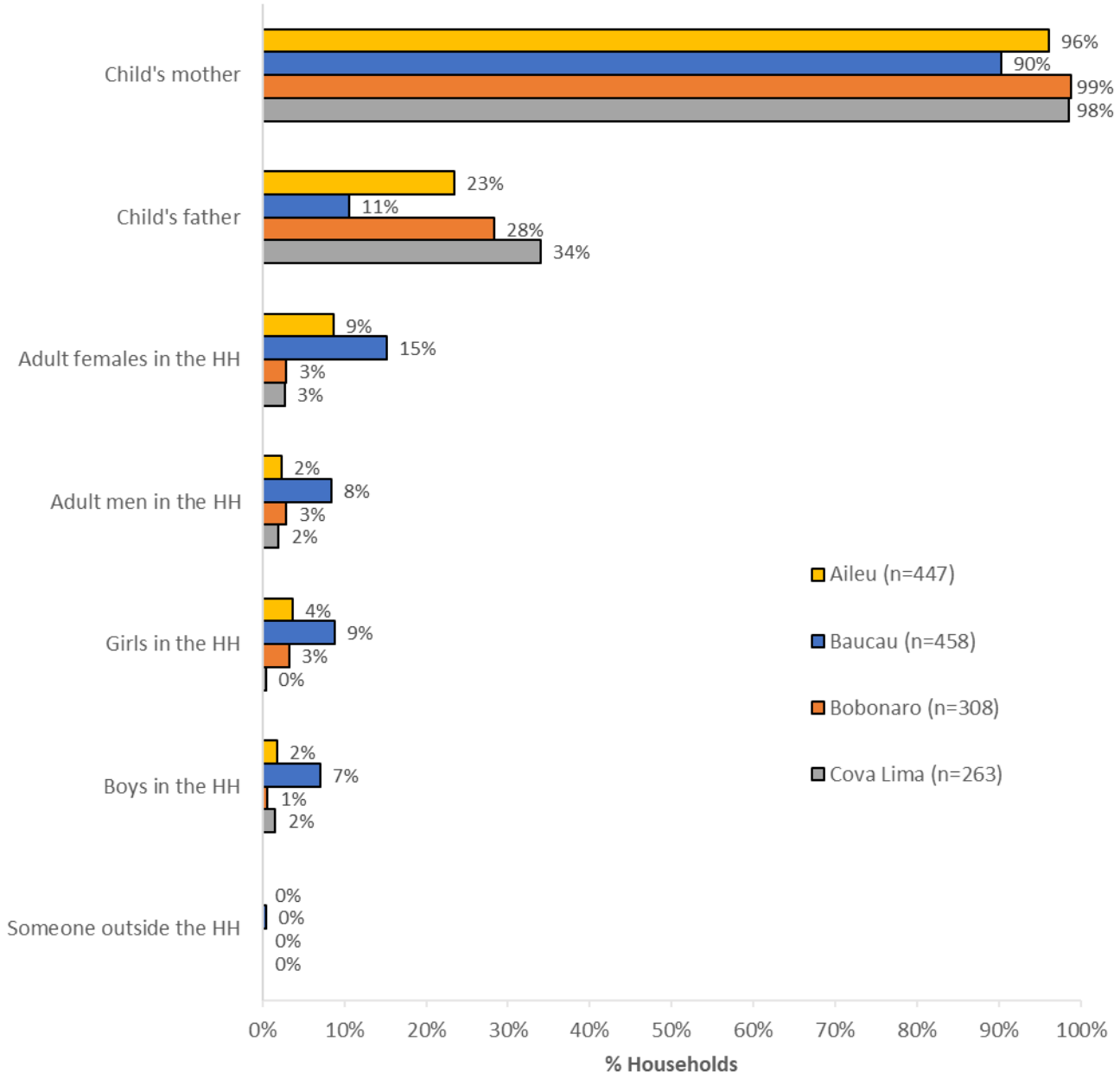



(b) Female Respondents in Project Areas (n=386)



The baseline survey asked the respondent who is usually involved in the daily feeding and care for children. Responses are shown in Figure 9.1.6. Virtually all respondents nominated the child's mother, and some the child's father or other adults in the household. Responses by households in Baucau project areas appear slightly different to other municipalities, with other household members nominated and fewer mothers and fathers. Only one household in Baucau reported that someone outside the household was involved on a regular basis.

**Figure 9.1.6**
**Who is Usually Involved in Daily Feeding & Looking After Children?**



## 9.2 Outcome 1: Caregivers of under 5 children have improved nutrition, hygiene and health-seeking practices

Outcome 1 indicators relate to improved health-seeking, nutrition, hygiene and family planning practices.

**Outcome 1:**
**Caregivers of under 5 children have improved nutrition, hygiene and health-seeking practices**

***Health-Seeking Practices:***

1.1.1. % mothers of children 0-59 months who report attending 4 or more ANC visits while pregnant with youngest child.
1.1.2. % children 0-59 months whose birth was attended by a skilled health professional [MELF 1.307 - Number (x) of additional births attended by a skilled birth attendant].
1.1.3. % mothers who were accompanied by their husband/partner at ANC visits while pregnant with youngest child.
1.1.4. % children 0-59 months who attended SISCa / health facility in the last 3 months.
1.1.5. % children 4-59 months vaccinated against DPT3 [MELF 1.301 - Number (x) of girls and boys vaccinated (against DPT3 as the selected proxy indicator for vaccination)].

***Nutrition Promoting Practices:***

1.2.1. % children 0-5 months exclusively breastfed in the last 24 hours.
1.2.2. % children 12-23 months who received breastmilk in last 24 hours.
1.2.3. % children 6-59 months consuming superfoods in the last 24 hours.
1.2.4. % mothers of children 0-59 months consuming superfoods in the last 24 hours.
1.2.5. % pregnant women consuming 'superfoods' in the last 24 hours.
1.2.6. Average number of food groups consumed by children 6-59 months in the last 24 hours.
1.2.7. % households with children <5 where men are regularly involved in household feeding & nutrition

***Hygiene Practices:***

1.3.1. % households with children 0-59 months with appropriate handwashing facilities [CIB.0130, MELF 1.202 - Number (x) of people with hand washing facilities and soap or ash/other cleaning substances in their household].
1.3.2. % carers of children 0-59 months knowledgeable about basic hygiene practices [MELF 1.201 - Number (x) of people with increased knowledge of hygiene practices].
1.3.3. % households where animals are prevented from entering the house.

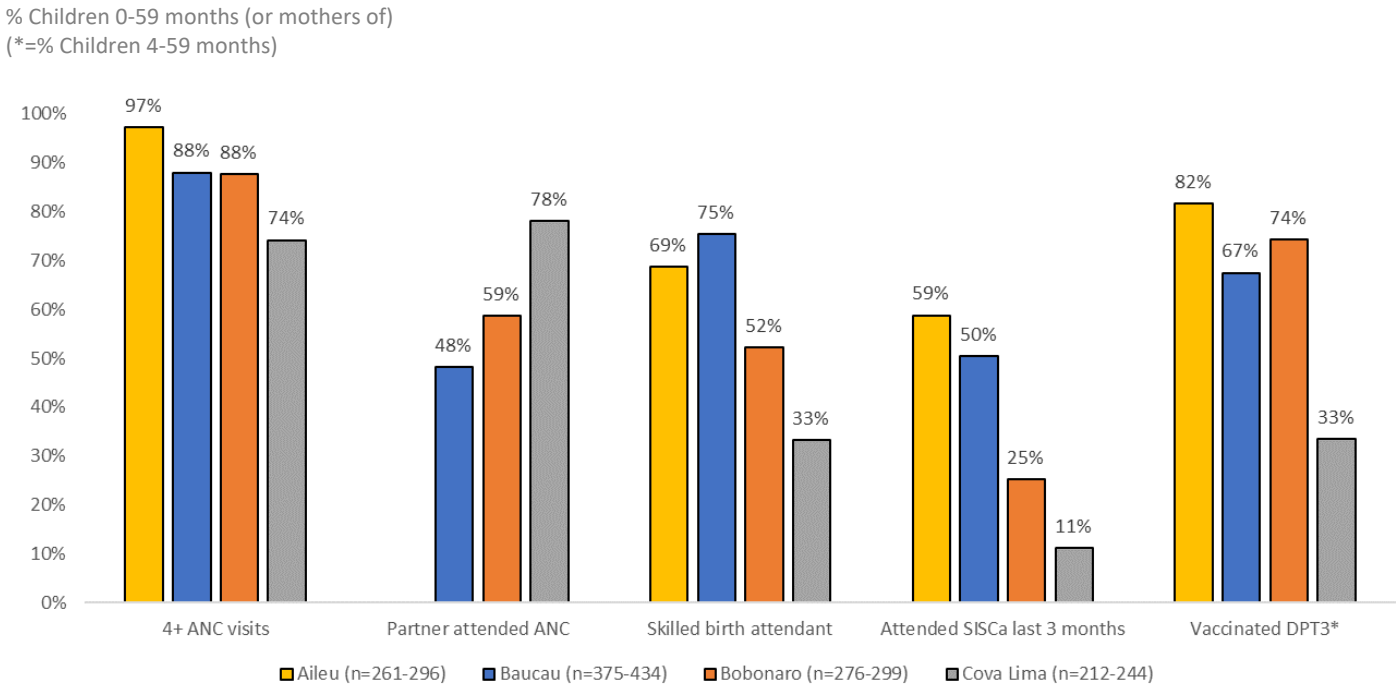
***Family Planning:***

1.4.1. % of in-union women aged 15-49 who report that they are currently using a modern contraceptive method.
1.4.2. % of in-union women aged 15-49 who are continuous users of family planning.

## Health-Seeking Practices

Figure 9.2.1 shows results for indicators relating to health-seeking practices. In Aileu project areas, virtually all (97%, n=286) mothers of children aged 0-59 months report attending four or more antenatal care (ANC) visits while pregnant with their youngest child. The rate is also high in Baucau (88%, n=434) and Bobonaro (88%, n=299) but could be improved in Cova Lima (74%, n=244). Among those mothers who attended any ANC, a varied proportion also reported their partner attended some of these: 48% in Baucau (n=413), 59% (n=286) in Bobonaro and 78% (n=205) in Cova Lima. This question was not asked in the Aileu survey.

**Figure 9.2.1**
**Health-Seeking Practices**




Attendance at the birth by a skilled health professional (doctor, nurse or midwife), whether at home or in a health facility, is variable by location: highest in Baucau (75%, n=434) and lowest in Cova Lima (33%, n=244). The rates inversely reflect the proportion of births given in the home: 40% in Aileu, 35% in Baucau, 52% in Bobonaro and 71% in Cova Lima. When asked why the mother decided to give birth at home and/or why a skilled birth professional was not in attendance at the birth, 84% of mothers responded that there was no alternative because the baby came too quickly. Other commonly reported reasons were lack of transport and distance to health facilities. There was no indication that mothers were scared of health facilities or personnel or that health personnel were not available at health facilities. These results highlight the importance of developing pro-active and realistic birth plans – that is, plans that recognise and factor in the realities with location and transportation.

Attendance at SISCa in the three months prior to the baseline survey is similarly variable by location: from 59% in Aileu to as low as 11% in Cova Lima. These rates could reflect the slightly different timing of the baseline surveys – Aileu in June 2017, Baucau in March 2018, and Bobonaro and Cova Lima in

January/February 2018 – such that for Bobonaro and Cova Lima the three months prior to the survey cover the Christmas and New Year period.

Rates of the third course of vaccination against diphtheria, pertussis and tetanus (DPT3) or Pentavent are highest in Aileu (82%, n=261), moderate in Baucau (67%, n=375) and Bobonaro (74%, n=276), and low in Cova Lima (33%, n=212).[30] The higher rates in Aileu and Bobonaro suggest that children attend SISCa a sufficient number of times throughout early life to complete their vaccinations. The lower attendance rates at SISCa in the last three months, however, suggest attendance is not regular through to age five. Indeed, children under two are much more likely to have attended SISCa in the last three months than are children aged 2-5. Qualitative interviews revealed that some mothers see little benefit in attending SISCa once vaccinations are completed, and in particular, MUAC rather than weight for age tended to be the diagnostic tool used for children aged two and above. In Cova Lima, the low rates of attendance at SISCa in the last three months and the lack of DPT/Pentavent vaccination coverage in Cova Lima highlight a systemic concern with lack of SISCa attendance – in fact, 43% of children in the Cova Lima sample have never attended SISCa.

43% of children in the Cova Lima sample have never attended SISCa.

## Nutrition Promoting Practices

Indicators used to assess improvements in nutrition promoting practices among children aged 0-59 months, their mothers and pregnant women include rates of exclusive breastfeeding, currently receiving breastmilk, consumption of 'superfoods', dietary diversity, and regular involvement of men in household feeding and nutrition. Definitions of exclusive breastfeeding (EBF), continued breastfeeding and dietary diversity were based on World Health Organisation (WHO) Infant and Young Child Feeding (IYCF) indicators.

**Exclusively breastfed:** children aged 0-5 months who received only breastmilk in the previous day (24 hours). Vitamins, minerals, medicines, and oral rehydration solutions are permitted, but no other liquids or solids and no water.

**Currently breastfed:** children aged 12-23 months who received breastmilk (breastfed, expressed or from a wet nurse) in the previous day (24 hours).[31] With previous studies[32] highlighting a tendency to wean at around 12 months and limited consumption of protein sources in the Timor-Leste diet due to low incomes, BFBH's promotion of continued breastfeeding to two years or more is expected to be a critical means by which protein and calorie intake can be increased among children in this age group when growth faltering typically occurs.

**Consumed 'superfoods':** consumption of any one or more of the six BFBH 'superfoods' – soybeans, mung beans, red kidney beans, orange sweet potato, moringa or eggs – or products made from these

[30] Children aged 4-59 months. For comparison with other studies such as the DHS, rates for children aged 12-23 months are: Aileu 88% (n=100), Baucau 73% (n=133), Bobonaro 82% (n=83), Cova Lima 26% (n=58).
[31] The indicator is related to the WHO's 'continued breastfeeding at age one' (children aged 12-15 months) and 'continued breastfeeding at age two' (children aged 20-23 months). However, the age ranges for these indicators are very tight and so the sample size is too small to present for comparative purposes. The rate for the age group 12-23 months is, however, reported in the 2016 DHS.
[32] e.g. Cornwell, Inder, Benevides and Grey (2016): https://drive.google.com/open?id=0BxiFT7ChCZQqMGJibHlWdE5TckU.

'superfoods' in the previous day (24 hours). This is calculated for children aged 6-59 months, mothers of children aged 0-59 months and also for pregnant women.

**Food groups:** the definition of food groups follow the WHO IYCF definitions[33] for seven food groups:

(1) Grains, roots and tubers
(2) Legumes and nuts
(3) Dairy products: milk, yoghurt and cheese
(4) Flesh foods: meat, fish, poultry and liver/organ meats
(5) Eggs
(6) Vitamin-A rich fruits and vegetables: in general, these include dark green leafy vegetables and fruits and vegetables that are yellow or orange inside
(7) Other fruits and vegetables.

A complete listing of specific foods that fall in each category is contained in WHO (2008)[34].

BFBH's outcome indicator 1.2.6: *Average number of food groups consumed by children aged 6-59 months in the last 24 hours* is defined as the average number of food groups consumed by children aged 6-59 months in the 24-hour recall period, out of the seven food groups listed above, but allowing food group (3) to also include breastmilk. We depart from the standard WHO definition of food group (3) as this allows for direct comparison of dietary diversity for breastfed and non-breastfed children – it equalises the total number of food groups able to be consumed by breastfed and non-breastfed children. This is particularly important for assessing improvements in dietary diversity and protein consumption in the BFBH project, where there is a focus on continued breastfeeding. Minimum Dietary Diversity under the strict WHO definition will improve simply if children switch from breastmilk to infant formula. Furthermore, since the tally of food groups for breastfed and non-breastfed children are different, the rate of adherence to a Minimum Dietary Diversity (MDD) will change if the ratio of breastfed to non-breastfed children changes.[35]

Furthermore, the WHO calculates the MDD for the age range 6-23 months. For completeness and to enable comparison with other studies, therefore, we present indicators relating to food groups under both the strict WHO-definition and our modified version, and the MDD for children aged 6-23 and 6-59 months. In particular we define and present the following alternative indicators:

**ALT1: Average number of food groups consumed – strict WHO categories:** average number of food groups consumed by children aged 6-59 months in the 24-hour recall period, out of the seven WHO-defined food groups.

**ALT2: % Children satisfying a MDD – strict WHO categories:** proportion of children consuming at least four out of the seven WHO-defined food groups in the 24-hour recall period. Calculated for children aged 6-23 and also for children aged 6-59 months.

[33] In this report we refer to minimum dietary diversity as defined by WHO (2008) when used as a standalone indicator. WHO (2008) also defines a minimum dietary diversity indicator for use as a component in calculation of the overall WHO (2008) indicator for a minimum acceptable diet. The difference relates to how milk feeds are included for non-breastfed children: milk feeds are not included in the component (since there is another component relating to milk feeds), but are allowed in calculation of the standalone indicator.
[34] WHO (2008), Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6–8 November 2007 in Washington D.C., USA.
[35] For further discussion and explanation, see Cornwell, Inder, Benevides and Grey (2015, 2016): https://drive.google.com/open?id=0BxiFT7ChCZQqMGJibHlWdE5TckU.

**ALT3: % Children satisfying a MDD – including breastmilk in the dairy category:** proportion of children aged 6-59 months consuming at least four out of the seven food groups in the 24-hour recall period, but allowing food group (3) to also include breastmilk.

Table 9.2.1 provides the results for outcome 1 indicators relating to nutrition practices, along with the three alternative nutrition indicators defined above.

**Table 9.2.1**
**Outcome 1 Nutrition Practices in Project Areas**

| Indicator | | Age group (months) | Aileu | | Baucau | | Bobonaro | | Cova Lima | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | unit | n | unit | n | unit | n | unit | n |
| 1.2.1 | % Children exclusively breastfed | 0-5 | 80.0% | 45 | 69.9% | 83 | 59.0% | 39 | 54.4% | 57 |
| 1.2.2 | % Children currently breastfed | 12-23 | 75.0% | 100 | 41.4% | 133 | 56.6% | 83 | 27.6% | 58 |
| 1.2.3 | % Children consuming at least one 'superfood' in the last 24 hours | 6-59 | 14.7% | 251 | 13.3% | 353 | 21.0% | 262 | 6.7% | 195 |
| 1.2.4 | % Mothers of children 0-59 months consuming at least one 'superfood' in the last 24 hours | | 14.6% | 274 | 10.4% | 422 | 25.3% | 292 | 4.1% | 241 |
| 1.2.5 | % Pregnant women consuming at least one 'superfood' in the last 24 hours | | 9.7% | 31 | 10.5% | 57 | 37.0% | 27 | 4.9% | 41 |
| 1.2.6 | Average number of food groups consumed - including breastmilk in the dairy category | 6-59 | 2.69 | 251 | 2.30 | 353 | 2.41 | 262 | 2.15 | 195 |
| ALT1 | Average number of food groups consumed – strict WHO categories | 6-59 | 2.12 | 251 | 2.02 | 353 | 2.11 | 262 | 1.89 | 195 |
| ALT2 | % Children satisfying MDD – strict WHO categories | 6-23 | 2.0% | 149 | 11.3% | 203 | 7.7% | 130 | 1.0% | 102 |
| | | 6-59 | 6.0% | 251 | 12.5% | 353 | 7.6% | 262 | 3.1% | 195 |
| ALT3 | % Children satisfying MDD - including breastmilk in the dairy category | 6-59 | 15.9% | 251 | 14.7% | 353 | 10.7% | 262 | 4.1% | 195 |
| 1.2.7 | % Households with children aged 0-59 months where adult men are regularly involved in child feeding & care | | 23.5% | 298 | 13.0% | 432 | 29.0% | 297 | 34.2% | 243 |

Rates of exclusive breastfeeding among children aged 0-5 months are higher than the 50% national average reported in the 2016 DHS in all municipalities. In particular, a very high rate of 80% (n=45) is observed in Aileu project areas. Cova Lima reports the lowest among the four municipalities at 54%. Among the children aged 0-5 months in project areas that were not exclusively breastfed (n=42)[36], 71% received breastmilk, 59% water, 41% infant formula and 10% tea or coffee.

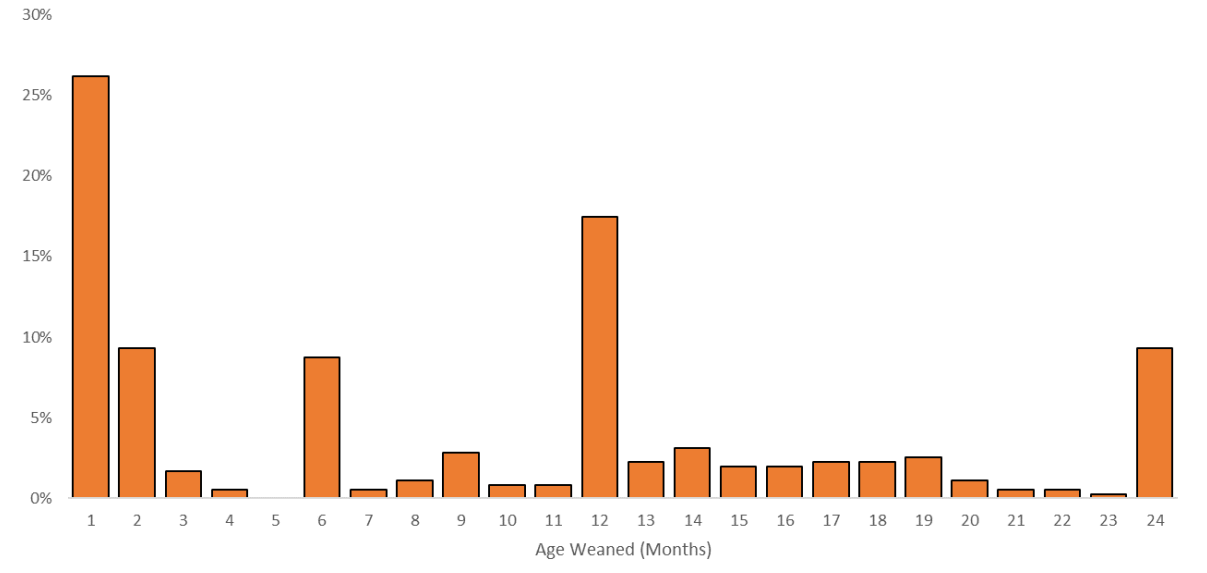
[36] Combined baseline sample.

Current breastfeeding of children aged 12-23 months is higher than the 2016 DHS national rate of 52% in all municipalities except Cova Lima at 28% (n=58).

Indicator 1.2.2 relates to current breastfeeding – that is, the proportion of children aged 12-23 months who received breastmilk in the last 24 hours. Rates for this indicator are quite varied by municipality: from a very high 75% (n=100) in Aileu to a very low 28% (n=58) in Cova Lima. While the 2016 DHS reports a national average rate of 52% for this indicator, it does not indicate how varied this is by location: on average the baseline sample is in line with this national average.

In the baseline mothers of children in the sample who were no longer breastfed were asked at what age they weaned their child, and why they chose to wean the child at that particular age. Figure 9.2.2 shows the distribution of results for children aged 24-59 months in project areas who are no longer breastfed. 53% of the children were weaned before 12 months of age and 89% before 24 months of age. Most surprising is the large spike at one month of age, suggesting 26% of children were weaned at one month of age, and 38% before six months of age. This contradicts the rates of EBF and suggests this question was not adequately understood and answered. Nonetheless the figure does highlight that cessation of breastfeeding (weaning) usually takes place much earlier than the WHO-recommendation of 24 or more months. When asked why they chose to wean, most mothers responded that they felt the child was old enough, or the child refused to drink breastmilk.

**Figure 9.2.2**
**Age of Cessation of Breastfeeding in Months**
**% Non-Breastfed Children aged 24-59 months (n=355)[37]**




Children (aged 6-59 months) in Bobonaro project areas were most likely to have consumed a 'superfood' in the 24-hour recall period (21%), and least likely in Cova Lima (7%). Utilisation of 'superfoods' by mothers was of a similar magnitude to those observed among children. Rates for pregnant women are of similar magnitude but more varied due to the smaller sample sizes for this group. The fact that utilisation patterns were similar for mothers and children suggests a lack of access to such foods rather than a lack of knowledge that these foods are good for children: if the household

[37] Combined baseline sample.

has access to 'superfoods' both mothers and children consume them. Note that utilisation patterns are likely to be highly sensitive to the seasons and the timing of the Study.

Table 9.2.2 provides details on the type of 'superfood' consumed by children aged 6-59 months. Of the six 'superfoods', eggs appeared to be the most commonly consumed 'superfood' by children in Aileu, Baucau and Cova Lima. In Bobonaro, moringa was most commonly consumed, followed by eggs and orange sweet potato. Further analysis of the data revealed that while eggs were the most common 'superfood' consumed by children, red kidney beans were more commonly consumed by mothers and pregnant women (although both were rarely consumed). While these pairs may not represent a child and mother from the same household, this suggests that when eggs are available they are eaten by the child rather than the mother, and vice-versa for red kidney beans. 'Superfood' consumption and therefore protein intake and dietary diversity could be improved through the promotion of sharing these foods between children and mothers and overcoming any misconceptions such as red kidney beans not being suitable for children, or taboos restricting the intake of eggs for breastfeeding and pregnant women.

**Table 9.2.2**
**'Superfoods' Consumed in the Last 24 Hours by Children (aged 6-59 months)**

| | Aileu | Baucau | Bobonaro | Cova Lima |
|---|---|---|---|---|
| Superfoods: | | | | |
| Soybeans | 2% | 2% | 1% | 1% |
| Red kidney beans | 3% | 1% | 0% | 0% |
| Orange sweet potato | 2% | 4% | 6% | 0% |
| Moringa | 0% | 4% | 12% | 2% |
| Eggs | 10% | 6% | 7% | 4% |
| Mung beans | 0% | 1% | 0% | 0% |
| Any superfood | 15% | 13% | 21% | 7% |
| n | 251 | 353 | 262 | 195 |

Outcome indicator 1.2.6 and the three alternative indicators relate to the number of food groups consumed by children aged 6-59 months in the 24-hour recall. Allowing the traditional dairy category to include breastmilk, results for indicator 1.2.6 in Table 9.2.1 indicate that the average number of food groups consumed in project areas ranged from 2.15 in Cova Lima to 2.69 in Aileu. Using the stricter WHO definition, rates were as low as 1.89 in Cova Lima and 2.12 in Aileu – both indicate very low dietary diversity as highlighted by the low rates for the alternative indicators ALT2 and ALT3.

Further detail on food groups consumed by children (aged 6-59 months) are shown in Figure 9.2.3 (by location) and 9.2.4 (by breastfeeding status).

**Figure 9.2.3**
**Food Groups Consumed by Children (aged 6-59 Months)**
**By Project Area Location**

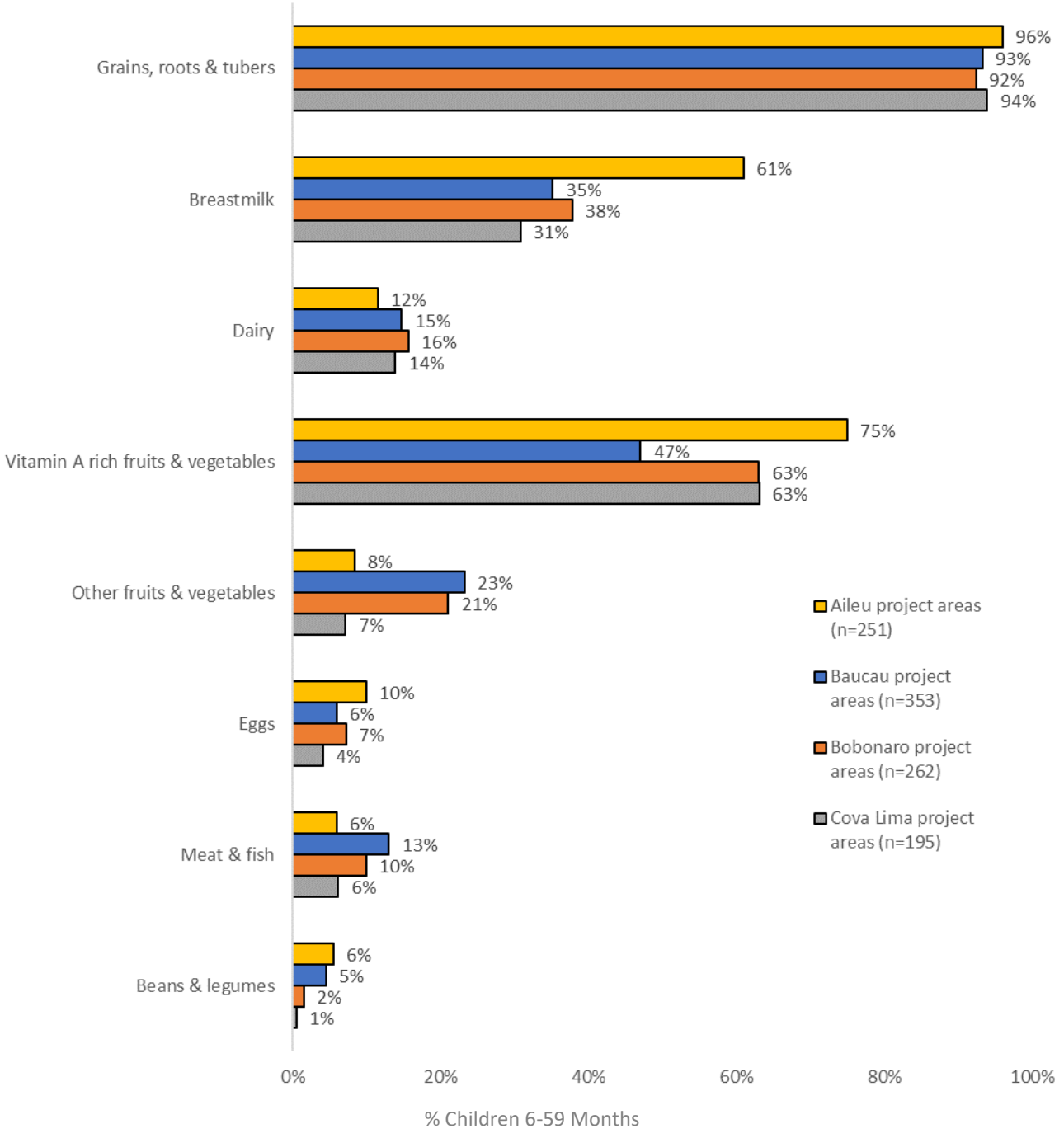
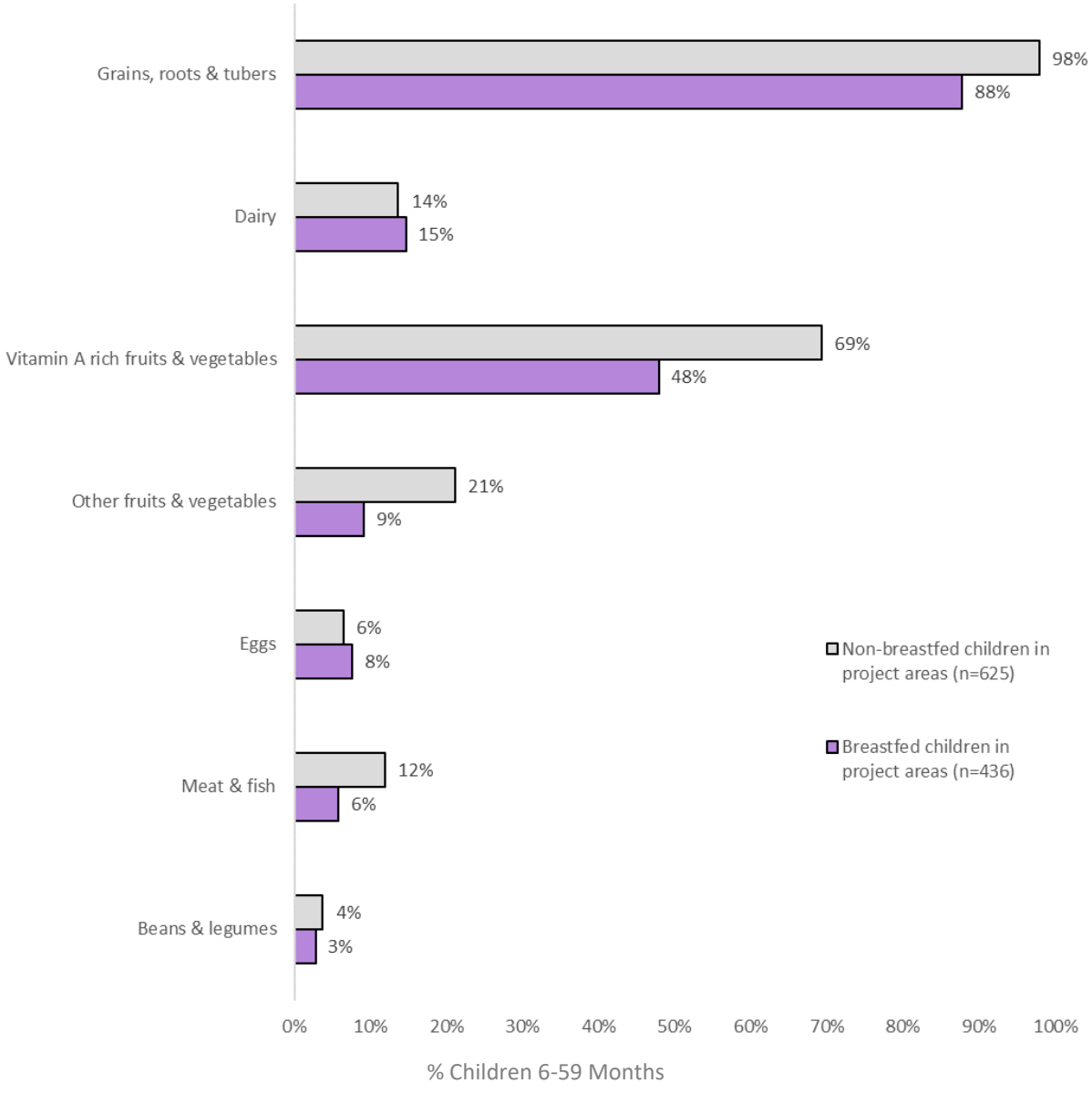



Figure 9.2.3 indicates that almost all children (aged 6-59 months) consumed foods from the grains, roots and tubers category with rice porridge being a major contributor to this. Most children also consume a vitamin A rich fruit or vegetable – usually a green leafy vegetable mixed into the rice porridge – and breastfed children receive breastmilk. Among the BFBH project areas, children in Aileu consume the most vitamin A-rich fruits and vegetables and breastfeeding is more common. Very few children across all BFBH project areas consume foods from other food groups. Children in Baucau and Bobonaro are most likely to consume other fruits and vegetables and meat and fish. Most notably, children across all BFBH project areas rarely consume beans and legumes, the category within which

are many of the BFBH 'superfoods'. While this may suggest that improving consumption of these foods could be a challenge, it also presents an area where significant improvements are possible.

Figure 9.2.4 outlines the consumption of different food groups according to current breastfeeding status.[38]

**Figure 9.2.4**
**Food Groups Consumed by Children (aged 6-59 Months)**
**By Breastfeeding Status[39]**




[38] Since the older the child the more likely they are to have been weaned, the breastfed/non-breastfed categorisation will also coincide with younger versus older children within the under-five age bracket.
[39] Combined unweighted project area sample.

The data indicates that non-breastfed children are not more likely to consume dairy, eggs, beans or legumes, but are slightly more likely to consume fruits and vegetables, and meat, fish or their products than their breastfed counterparts. It is clear, however, that upon cessation of breastfeeding children are generally losing out on one food group: the typical breastfed child is consuming foods from three food groups, while the typical non-breastfed child is consuming from only two, both of which are well short of the WHO's minimum of four food groups.

The typical breastfed child is consuming foods from three food groups, while the typical non-breastfed child is consuming from only two, both of which are well short of the WHO's minimum of four food groups

Table 9.2.3 displays the consumption of individual foods and food products not featured in the WHO categories, in particular, salt, sugar and oil. Results reveal that while plain water is almost universally consumed by children (aged 6-59 months), a large proportion of children consume salt, sugar, oil and caffeinated drinks. Iodised salt was reported to be used by 55% of households – this is much lower than the 83% for rural areas reported by the 2016 DHS, which was based on testing of salt in the household. However, the DHS does report rates in Bobonaro to be much lower than this at only 35% of households having iodised salt.

**Table 9.2.3**
**Consumption of Sugar, Salt, Oil and Caffeine**
**Children 6-59 months**

| | Aileu | Baucau | Bobonaro | Cova Lima |
|---|---|---|---|---|
| Plain water | 94% | 97% | 95% | 95% |
| Tea or coffee | 55% | 22% | 58% | 63% |
| Soft drinks | 4% | 19% | 10% | 26% |
| Drinks with sugar - tea, coffee, sugar/honey water, soft drinks, fruit juice | 59% | 37% | 61% | 72% |
| Oil | 76% | 49% | 52% | 67% |
| Salt or masaco stock seasoning | 82% | 54% | 63% | 81% |
| Instant noodles | 3% | 14% | 15% | 5% |
| n | 251 | 353 | 262 | 195 |

Table 9.2.3 also indicates the prevalence of instant noodle intake which is often highlighted as a reason for poor nutrition in Timor-Leste. The results indicate that the prevalence is low across all project areas (3-15%). When asked in more detail about the consumption of instant noodles, households described them as side dish to rice and used when preferred foods such as vegetables or meat were not available.

### Hygiene Practices

Indicators relating to hygiene practices include observation of appropriate handwashing facilities (soap and water) in close proximity to the house, knowledge tests and prevention of animals from entering the house. Table 9.2.4 summarises these results.

**Table 9.2.4**
**Outcome 1 Indicators: Hygiene Practices**

| Indicator | | Aileu | | Baucau | | Bobonaro | | Cova Lima | |
|---|---|---|---|---|---|---|---|---|---|
| 1.3.1 | % households with children 0-59 months with appropriate handwashing facilities | 25% | 298 | 40% | 458 | 34% | 308 | 15% | 263 |
| 1.3.2 | % carers of children 0-59 months knowledgeable about basic hygiene practices | 38% | 298 | 41% | 458 | 25% | 308 | 26% | 263 |
| 1.3.3 | % households where animals are prevented from entering the house | 55% | 447 | 13% | 458 | 24% | 308 | 11% | 263 |

Appropriate handwashing facilities – that is, a place near the house that the enumerator could observe with water and soap (or equivalent cleaning substance) available – were found in few households: 25% of households in Aileu project areas, 40% in Baucau, 34% in Bobonaro and only 15% in Cova Lima.

Indicator 1.3.2 defines a carer knowledgeable in basic health and hygiene practices as those who correctly answer all of the following:

(1) A child can be fed solids: at 6 months
(2) A child can be fed water: from 6 months
(3) Washing hands can reduce: diarrhoea/stomach ache or bacteria or intestinal worms (not including responses that also mention mosquito-born diseases)
(4) When to wash hands: after going to the toilet / helping child to toilet and before eating.

Correct responses to all of the above health and hygiene practices was found for 25-41% of caregivers of children 0-59 months, with rates in Aileu and Baucau higher than those in Bobonaro and Cova Lima. While this overall summary indicator, requiring correct answers to all four components, is quite low, the rate of correct responses to the individual components are quite high, as shown in Table 9.2.5.

Upwards of 80% of caregivers were knowledgeable that solids can be introduced at 6 months of age. Introduction of water from 6 months was less well known in Bobonaro (68%) and Cova Lima (46%). This corroborates the high rates of reported exclusive breastfeeding among children under 6 months in Aileu and Baucau. Given that knowledge on timing of introduction of solids is so high, expanding this to include knowledge about water should be reasonably simple.

| Table 9.2.5<br>Components of Indicator 1.3.2: Basic Health and Hygiene Knowledge | | | | | |
|---|---|---|---|---|---|
| **Component** | | **Aileu project areas** | **Baucau project areas** | **Bobonaro project areas** | **Cova Lima project areas** |
| (1) | A child can be fed solids: at 6 months | 93% | 88% | 89% | 80% |
| (2) | A child can be fed water: from 6 months | 89% | 86% | 68% | 46% |
| (3) | Washing hands can reduce: diarrhoea/stomach ache or bacteria or intestinal worms | 52% | 64% | 48% | 71% |
| (4) | When to wash hands: after going to the toilet / helping child to toilet and before eating | 75% | 66% | 77% | 64% |

While the majority of mothers / carers of children 0-59 months responded that washing hands can reduce diarrhoea or stomach ache, this was often listed among a string of other ailments including some not related to bacteria such as mosquito-borne diseases. Interestingly the highest rate of correct responses to this question were in Cova Lima at 71%.

The last component received a moderate rate of correct answers. Within this component, a very high proportion of mothers / carers were able to report the need to wash hands after going to the toilet and before eating, however were let down by failing to mention the need to wash hands after assisting the child to toilet. While this suggests that knowledge in this area is already quite high in project areas, the practice of handwashing (as indicated by the availability of soap and water) is low. Investigation will need to be made as to why households do not put this hygiene knowledge into practice, and what local solutions can be promoted.

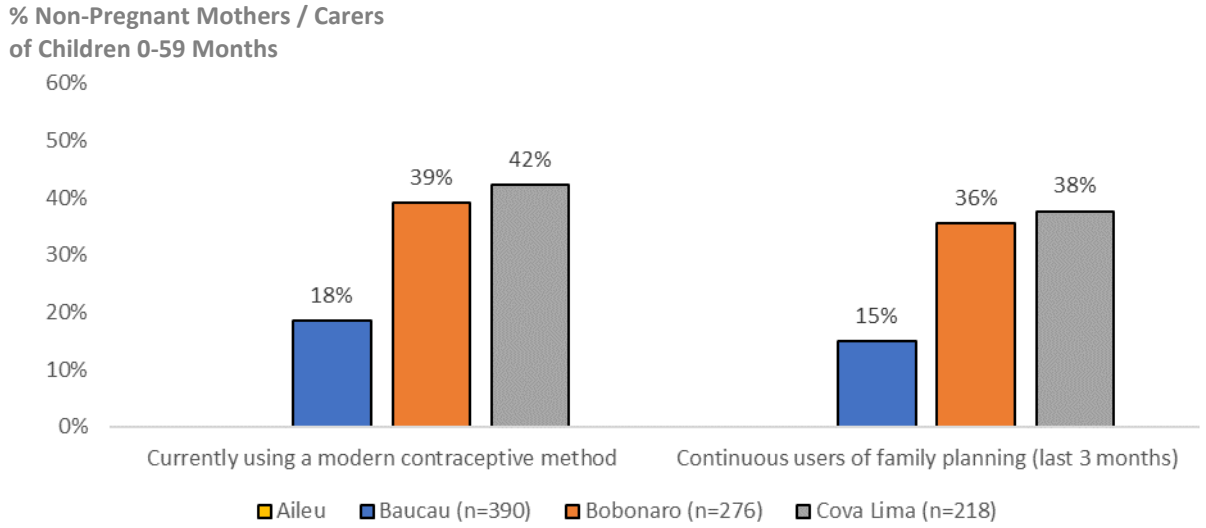
Results for indicator 1.3.3 show that prevention of animals from entering the house is rarely practiced in Cova Lima (11%), Baucau (13%) and Bobonaro (24%), and only moderately in Aileu (55%). In most cases, smaller animals such as chickens and dogs are shooed away when they come in rather than actively restrained by a door or fence, or being tied up. Indeed, the heat of the day often sees doors kept open or non-existent in most houses in Timor-Leste. Larger animals such as pigs do tend to be restrained either through being tied up or kept in a pen.

## Family Planning

The final set of indicators under Outcome 1 relate to family planning. These questions were only asked in the Baucau, Bobonaro and Cova Lima baseline survey due to changes in the logframe after the Aileu baseline was fielded. Note that since respondents of the baseline sample consisted almost exclusively of mothers/carers of children 0-59 months, these results may differ somewhat from comparative figures which are normally defined over all non-pregnant in-union women of childbearing age.

Figure 9.2.5 presents the results for women in the baseline sample who are not currently pregnant and who are aged 15-49 in project area locations. Rates are similar for current use of a modern contraceptive method and continuous use of any method in the last three months. Women in Baucau project areas record the lowest use of family planning (18% currently use a modern method, and 15% have used any form of modern contraception method consistently in the last three months). Interestingly, Baucau was also the location where husbands or partners were least likely to accompany pregnant women to ANC (see Figure 9.2.1).

**Figure 9.2.5**
**Outcome 1 Indicators: Family Planning**



## 9.3 Outcome 2: Households have Improved Access to Superfoods

**Outcome 2:**
**Households have Improved Access to Superfoods**

2.1.1. % households growing superfoods (any and disaggregated by superfood) either individually or as part of a collective effort (farmer group, parents' group).
2.1.2. Annual volume (kg/number of eggs) of superfood produced among producing households (disaggregated by superfood and also presented as kg/producing HH).
2.1.3. Average land area ($m^2$) utilised for superfood production among producing households (disaggregated by superfood).
2.1.4. % superfood-producing households processing superfoods (any).
2.2.1. % households consuming superfoods in the last week (any and disaggregated by superfood).
2.2.2. Average number of days in the last week households consumed superfoods (disaggregated by superfood).
2.2.3. Average number of months in the last year households report having difficulty accessing superfoods (any and disaggregated by superfood, reason for difficulty).
2.3.1. % households whose chickens have been vaccinated.
2.3.2. Average number of chickens lost/died in the last 12 months among households raising chickens.

Indicators for outcome 2 relate to access to superfoods: production, yield, processing, consumption and availability of superfoods.

### Superfood Production, Yield and Processing

Table 9.3.1 presents results for indicators relating to production, volume, land area and processing of superfood crops. Superfood production (also presented in Table 7.5) is low among project area households, with the exception of mung beans and moringa in Bobonaro (grown by 47% and 65% of households respectively, n=245).

In terms of the quantity of superfoods produced among those who do grow the crop, volumes are low. The typical household growing a superfood crop would grow no more than the equivalent of a 25-kilogram sack over a 12-month period. The median number of eggs produced in a year by a household's chickens is between 10 (Aileu, n=249) and 36 (Cova Lima, n=141).

| Table 9.3.1<br>Superfood Production, Yield and Processing | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **Unit** | **Aileu** | | **Baucau** | | **Bobonaro** | | **Cova Lima** | |
| % households producing superfoods | | | unit | n | unit | n | unit | n | unit | n |
| | Soybeans | % agricultural households | 16.2% | 402 | 0.0% | 338 | 2.9% | 245 | 0.9% | 225 |
| | Mung beans | | 0.0% | 402 | 0.0% | 338 | 46.5% | 245 | 3.6% | 225 |
| | Red kidney beans | | 22.6% | 402 | 0.0% | 338 | 4.1% | 245 | 0.4% | 225 |
| | Orange sweet potato | | 24.4% | 402 | 0.6% | 338 | 10.6% | 245 | 1.3% | 225 |
| | Moringa | | 0.3% | 399 | 0.9% | 338 | 65.4% | 245 | 22.7% | 225 |
| | Any superfood crop | | 36.8% | 402 | 1.5% | 338 | 77.2% | 246 | 25.3% | 225 |
| | Chickens/eggs | % households | 77.6% | 447 | 89.5% | 458 | 90.6% | 308 | 89.4% | 263 |
| Median annual volume of superfood produced among producing households | | | | | | | | | | |
| | Soybeans | Kg | 15 | 57 | 0 | 0 | 6.5 | 6 | 11 | 2 |
| | Mung beans | | 0 | 0 | 0 | 0 | 15 | 69 | 7 | 5 |
| | Red kidney beans | | 25 | 82 | 0 | 0 | 11 | 9 | 2 | 1 |
| | Orange sweet potato | | 25 | 92 | 7.5 | 2 | 19 | 15 | 60 | 3 |
| | Moringa | | 12 | 1 | 2 | 3 | 4 | 101 | 2 | 27 |
| | Eggs | Number of eggs | 10 | 249 | 12 | 232 | 24 | 78 | 36 | 141 |
| Median land area (m2) utilised for superfood production among producing households | | | | | | | | | | |
| | Soybeans | m2 | 9 | 41 | 0 | 0 | 5000 | 4 | 2502 | 2 |
| | Mung beans | | 0 | 0 | 0 | 0 | 5000 | 80 | 2500 | 8 |
| | Red kidney beans | | 9 | 48 | 0 | 0 | 2500 | 8 | 4 | 1 |
| | Orange sweet potato | | 10.5 | 64 | 100.5 | 2 | 5000 | 20 | 500 | 3 |
| | Moringa | | 2 | 1 | 20000 | 1 | 625 | 98 | 2400 | 39 |
| % superfood crop-producing households processing superfoods (any) | | | 15% | 148 | 2% | 458 | 23% | 308 | 6% | 263 |

Data on land area utilised for superfood crop production is limited due to the low numbers of households growing the crop. Furthermore, the land area figures obtained in the baseline appear to have been inconsistently measured between the Aileu and Baucau-Bobonaro-Cova Lima surveys: the median land size for growing superfoods in Aileu is around $9m^2$, while in Baucau, Bobonaro and Cova Lima the figures are in thousands of square metres. This unfortunately may render the baseline land area and therefore yield data to be unusable: it is recommended that more accurate data be obtained through monitoring of farmer group production rather than via a more general household survey such as this one.

Table 9.3.2 provides production and loss data for chickens and eggs, as the sixth superfood. The typical household owning chickens has 4-6 chickens. Seemingly these chickens rarely lay, with the typical household reporting their chickens laid in just one month in the last year, producing around 10 eggs in that month. Further investigation will need to be made to determine if the chickens are laying more than this, but the eggs are not recovered by the household – for example, they may not be discovered while chickens roam free, or may be eaten by dogs or pests. Such infrequent access to own-produced eggs by households would have a great impact on the ability to include eggs in the diet.

Many households reported losing chickens in the last year, as many as 70% of households raising chickens (n=279) in Bobonaro project areas. On average, households lost almost as many chickens as is the median number of chickens owned. Prevention against disease and protection from being eaten by animals is limited and rare: only around 10% of households owning chickens utilise a secure coop for their chickens either part or all of the day and night, and fewer than 5% of households had chickens that had been vaccinated against Newcastle's disease.

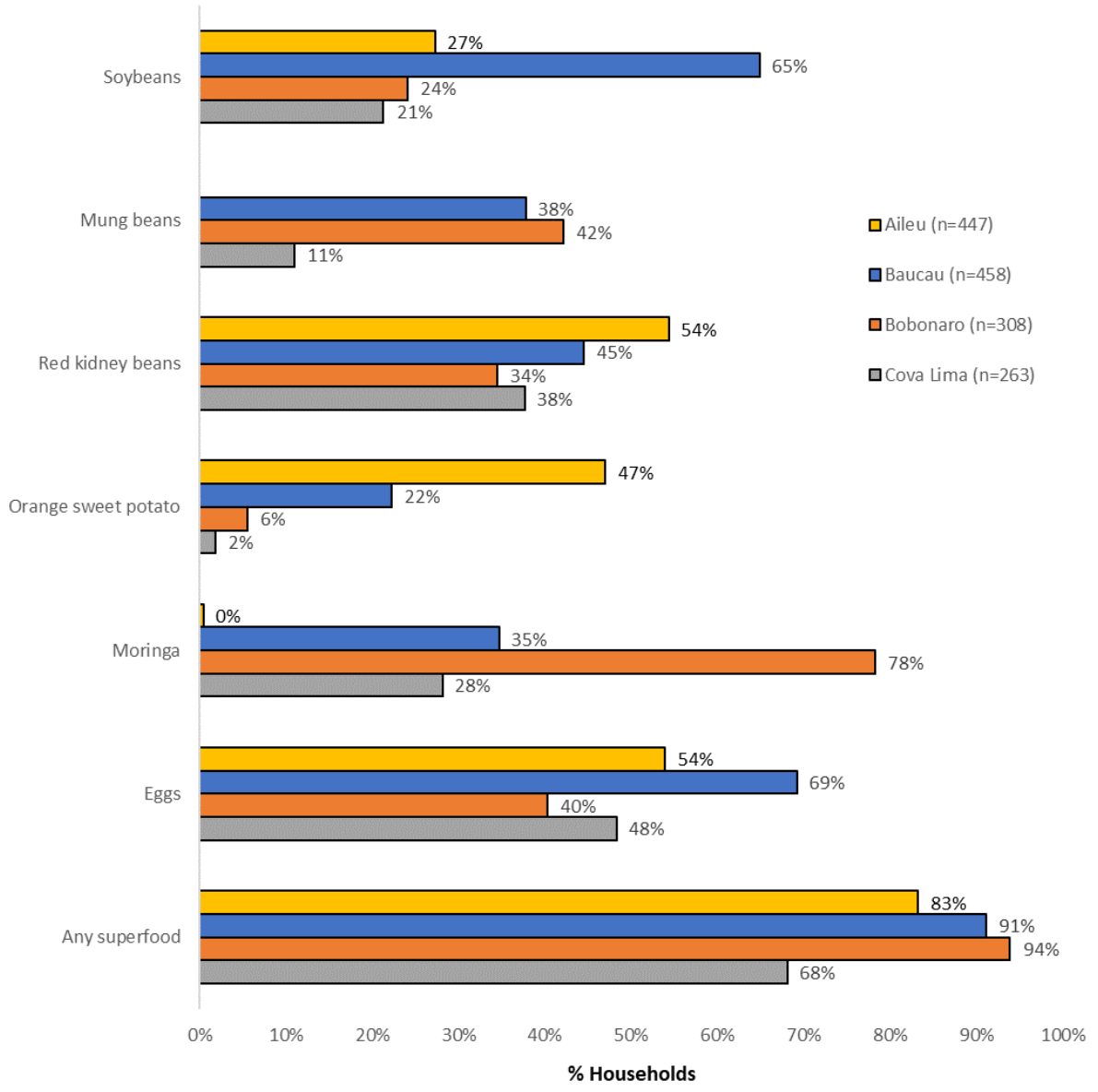
**Table 9.3.2**
**Chickens & Eggs**

| | Aileu | Baucau | Bobonaro | Cova Lima |
|---|---|---|---|---|
| Among all HHs: | n=447 | n=458 | n=308 | n=263 |
| % owning chickens | 77.6% | 89.5% | 90.6% | 89.4% |
| Among those HHs owning chickens: | n=347 | n=410 | n=279 | n=235 |
| Median number of chickens owned | 4 | 6 | 5 | 5 |
| Median number of laying months per year | 1 | 1 | 0 | 1 |
| Median number of eggs produced per laying month (all chickens) | 10 | 10 | 10 | 11 |
| % that have lost chickens in the last 12 months | 26.0% | 54.0% | 70.3% | 53.6% |
| Security of chicken housing: | | | | |
| Coop secure day and night | 1.0% | 0.5% | 5.7% | 3.8% |
| Coop secure part of the day | 10.0% | 5.1% | 1.4% | 8.1% |
| Insecure coop | 33.0% | 11.5% | 16.1% | 16.6% |
| No coop | 56.0% | 82.9% | 76.7% | 71.5% |
| % whose chickens have been vaccinated | 2.9% | 4.9% | 4.3% | 2.6% |
| Average number of chickens lost in the last 12 months | 1.89 | 3.69 | 4.88 | 3.08 |

## Consumption of Superfoods

Figure 9.3.1 shows the proportion of households reporting having consumed each of the BFBH superfoods in the seven days prior to the interview. Consumption may have been by any household member. Consumption rates vary substantially by location: households in Aileu were most likely to have consumed red kidney beans; households in Baucau, soybeans or eggs; and in Bobonaro, moringa. Virtually no households in Aileu consumed moringa, and only 2% (n=263) in Cova Lima consumed orange sweet potato. Most households in Aileu (83%, n=447), Baucau (91%, n=458) and Bobonaro (94%, n=308) consumed at least one superfood in the last seven days; in Cova Lima the rate was only 68% (n=263). These results are generally a lot more positive than the 24-hour recall data, highlighting that these foods are not eaten daily, but may indeed be eaten on a weekly basis in most households.

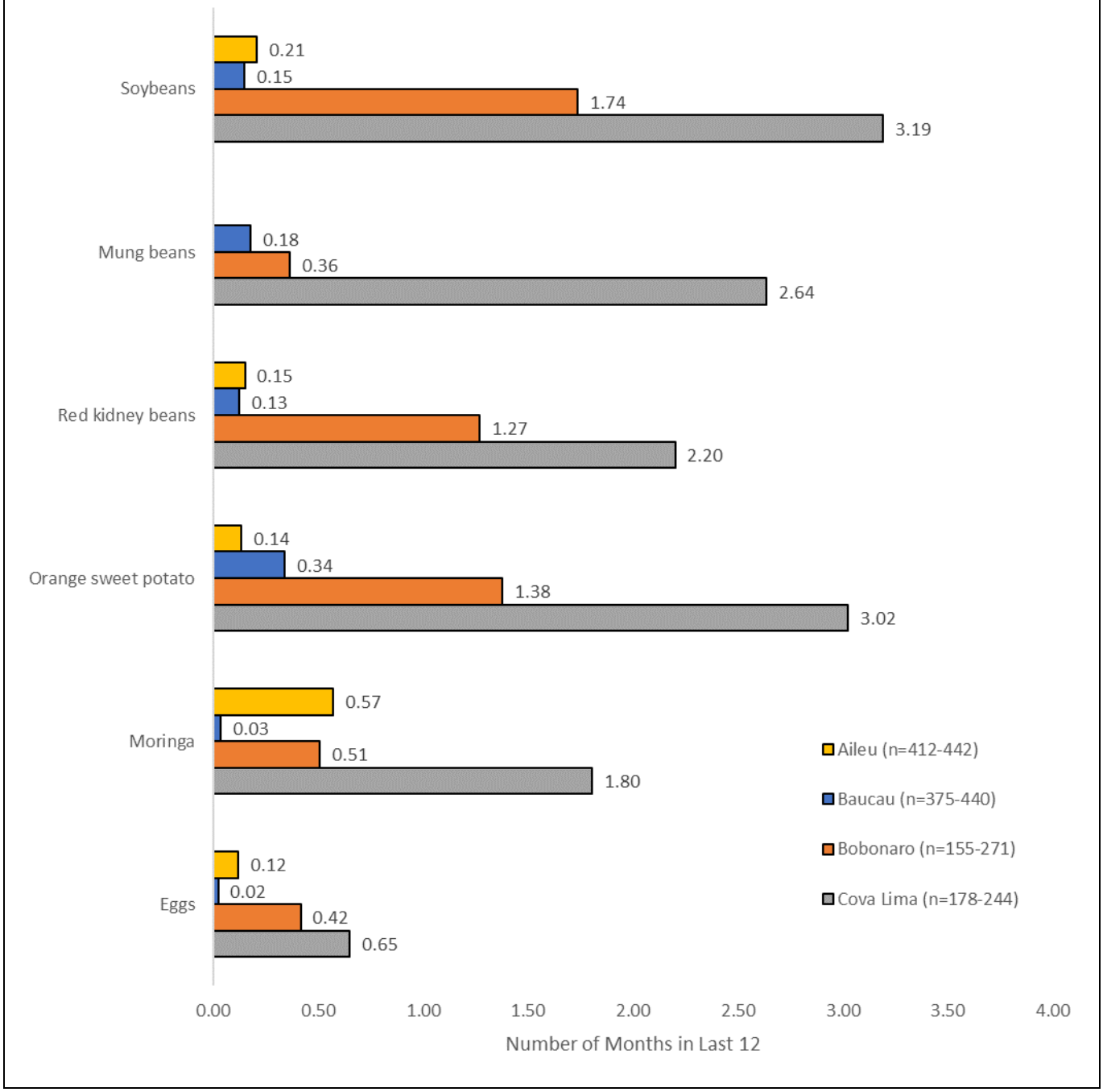
**Figure 9.3.1**
**Household Consumption of Superfoods in the Last 7 Days**



## Availability of Superfoods

In the baseline survey, households were asked whether they had difficulty sourcing or having each of the six superfoods in the last 12 months, and if so, for how many months of the year. Results are shown in Figure 9.3.2.

**Figure 9.3.2**
**Number of Months in the Last 12 with Difficulty Sourcing Superfoods**



Households in Cova Lima consistently report the greatest number of months with difficulty in each of the six superfoods, with most in shortage for 2-3 months of the year. Baucau also reports shortages in each of the superfoods for around one month of the year. Few households in Aileu or Baucau report shortages. Eggs appear to be the superfood least likely to be in shortage. Given that rates of consumption of superfoods tend to be low, for Aileu and Baucau in particular, this suggests that the low consumption rates are more to do with preferences and knowledge rather than access to such foods. Among those reporting difficulty, the main reason mentioned was that the foods were not being sold in the local area, or the household does not grow those foods.

Households were also asked about difficulties sourcing or having rice and fresh vegetables in the baseline survey. Rates of difficulty with rice were much higher in Bobonaro (52%) and Cova Lima (41%) than in Aileu (15%) and Baucau (10%). The majority experienced this difficulty for financial reasons, or because rice was not available to buy locally. Fewer households reported difficulty having fresh vegetables (Aileu, 8%; Baucau 7%; Bobonaro 19% and Cova Lima 16%) and this was due to financial issues, being unavailable to buy locally or crop loss due to weather. When rice was difficult, the vast majority of households switched to starchy tubers such as cassava and taro that are kept in 'storage' in the ground. This is not common practice with orange sweet potato – BFBH could promote 'storage' of orange sweet potatoes in the ground much like current practice with cassava and taro. The vines and leaves could also be consumed as a green leafy vegetable, as is done with other tubers.

Converse to rice shortage, when vegetables were difficult to obtain, the coping strategy was to go without vegetables ("eat dry rice"). In terms of who in the household went without, this was either the whole household or the older men and women. Children were never reported as missing out.

Many households utilise storage drums from the Ministry of Agriculture and Fisheries (MAF) for storage of household production of corn/maize, but other crops are either not amenable to this method or are rarely produced in large quantities to warrant storage.

BFBH could promote 'storage' of orange sweet potatoes in the ground much like current practice with cassava and taro.

## 9.4 Outcome 3: Households have increased income from superfood production

**Outcome 3:**
**Households have Increased Income from Superfood Production**

3.1.1. Average household income from sale of superfoods and their products, among superfood-producing households - either individually or as part of a collective effort (farmer group, parents' group) [MELF 3.102 - Number (x) of poor women and men with increased income].
3.1.2. Proportion of households earning income from superfoods and superfood-related activities (production, labour, processing, sale) - either individually or as part of a collective effort (farmer group, parents' group).
3.2.1. Average annual savings/funds mobilised per savings group. [not collected at baseline]
3.2.2. Average annual savings/funds mobilised per savings group member. [not collected at baseline]
3.2.3. Average amount of household savings.

Table 9.4.1 shows the proportion of households earning income from superfoods, and among these, the median annual income (revenue less costs of production, if incurred). Very few households in Aileu or Baucau earned income from superfood crops in the last 12 months – the proportions among growing respondents are all less than 7%. Superfoods are more commonly sold in Bobonaro, most common being mung beans grown by 126 households and being sold by 36% of these. Interestingly while moringa is the most common superfood crop in Bobonaro, it is only sold by 2% of growing households (n=169). Proportions selling superfood crops in Cova Lima appear high, but actually these represent very few households. Only 10% (n=347) of households with chickens in Aileu sold chickens or eggs, but this was higher in Baucau (28%, n=410), Bobonaro (34%, n=279) and Cova Lima (42%, n=235).

Due to few households selling superfood crops, income figures are sparse and consequently there is insufficient data to obtain precise estimates for average incomes earned, however figures obtained indicate very little annual income is earned from superfood crops. Median annual income from selling chickens and/or eggs is quite low at $30-40 – representing the sale of 3-4 chickens.

| Table 9.4.1<br>Income from Sale of Superfoods | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Aileu | | Baucau | | Bobonaro | | Cova Lima | |
| % earning income from superfoods: | | | unit | n | unit | n | unit | n | unit | n |
| | Soybeans | %HHs growing the crop | 3% | 68 | 0% | 3 | 0% | 10 | 0% | 4 |
| | Mung beans | | 0% | 0 | 0% | 1 | 36% | 126 | 30% | 10 |
| | Red kidney beans | | 7% | 95 | 0% | 1 | 10% | 10 | 25% | 4 |
| | Orange sweet potato | | 7% | 105 | 0% | 4 | 15% | 27 | 25% | 4 |
| | Moringa | | 0% | 2 | 0% | 6 | 2% | 169 | 7% | 56 |
| | Chickens / Eggs | % HHs raising chickens | 10% | 347 | 28% | 410 | 34% | 279 | 42% | 235 |
| | Any superfood | % HHs | 11% | 447 | 26% | 458 | 40% | 308 | 40% | 263 |
| Annual median income (revenue less cost of inputs) | | | | | | | | | | |
| | Soybeans | $median among those selling the crop | $16.50 | 2 | - | 0 | - | 0 | - | 0 |
| | Mung beans | | - | 0 | - | 0 | $75.00 | 39 | $0.00 | 3 |
| | Red kidney beans | | $22.50 | 6 | - | 0 | $50.00 | 1 | $0.00 | 1 |
| | Orange sweet potato | | $10.00 | 7 | - | 0 | $10.00 | 3 | $25.00 | 1 |
| | Moringa | | - | 0 | - | 0 | - | 0 | $0.00 | 2 |
| | Chickens / Eggs | $median among those selling chickens/eggs | $40.00 | 36 | $29.00 | 112 | $30.50 | 90 | $30.00 | 100 |

Households in Aileu are most likely to have any savings at 31% (n=447) of households, and those in Cova Lima the least likely at 11% (n=263). Among those with some savings, the median value varied from $50 in Aileu (n=140) to $300 in Cova Lima (n=29).

**Table 9.4.2**
**Household Savings**

| | Aileu | | Baucau | | Bobonaro | | Cova Lima | |
|---|---|---|---|---|---|---|---|---|
| | unit | n | unit | n | unit | n | unit | n |
| % HHs with any savings | 31.3% | 447 | 25.1% | 458 | 16.9% | 308 | 11.0% | 263 |
| Median value of savings among those HHs with some savings | 50 | 140 | 100 | 115 | 200 | 52 | 300 | 29 |

## 9.5 Outcome 4: Improved sustainability of health and agriculture services

Outcome 4 relates to sustainability of health and agricultural services. This will be facilitated by the project through support for Citizen Voice and Action groups – community groups whereby members and the wider community can bind together to affect change to public service quality and accountability. At baseline, these groups do not exist.

Other indicators under Outcome 4 at the household level include respondent perceptions and satisfaction levels with public services, ability to voice their opinions and make change to public service quality and accountability. At the PSF level, indicators relate to PSF chicken and egg production.

**Outcome 4:**
**Improved Sustainability of Health and Agriculture Services**

4.1.1. % people (women, men, women with disabilities, men with disabilities, total) attending CVA gatherings in the last 12 months. [not collected at baseline]
4.1.2. % people (women, men, women with disabilities, men with disabilities, total) reporting confidence in voicing their opinions in public.
4.1.3. % people (women, men, women with disabilities, men with disabilities, total) reporting confidence in being able to make change to public service quality and accountability in their community.
4.1.4. % people (women, men, women with disabilities, men with disabilities, total) reporting satisfaction with public services in their community.
4.2.1. Number of hectares covered with FMNR. [not collected at baseline]
4.3.1. Average number of chickens owned by PSF
4.3.2. Average number of eggs produced per month by PSF's chickens
4.3.3. % PSF with improved chicken housing.
4.3.4. % PSF whose chickens have been vaccinated.
4.3.5. Average number of chickens lost/died in the last 12 months among PSF raising chickens.

## Citizen Voice and Action

Figure 9.5.1 presents responses to questions relating to the respondent's perception of their ability to voice their opinions in public and to make change to public service quality and accountability, and whether they are satisfied with public services in their community. Respondents in Cova Lima report very low levels of confidence in both voicing their opinions and their ability to make change in their community at 19 and 20% respectively, compared to 43-51% in other municipalities. Bobonaro (33%, n=306) and Cova Lima (29%, n=263) report the lowest levels of satisfaction with public services in their community.

The "satisfaction with public services" indicator comprises four components:

(1) Health facilities in this place
(2) Health treatment and health personnel in this place
(3) Quality of public services in general, such as education, water, roads, etc. in this place
(4) Accountability and transparency of public services in this community

with the respondent satisfied overall if they report they are satisfied in all four of these components.

**Figure 9.5.1**
**Respondent Satisfaction with Public Services**

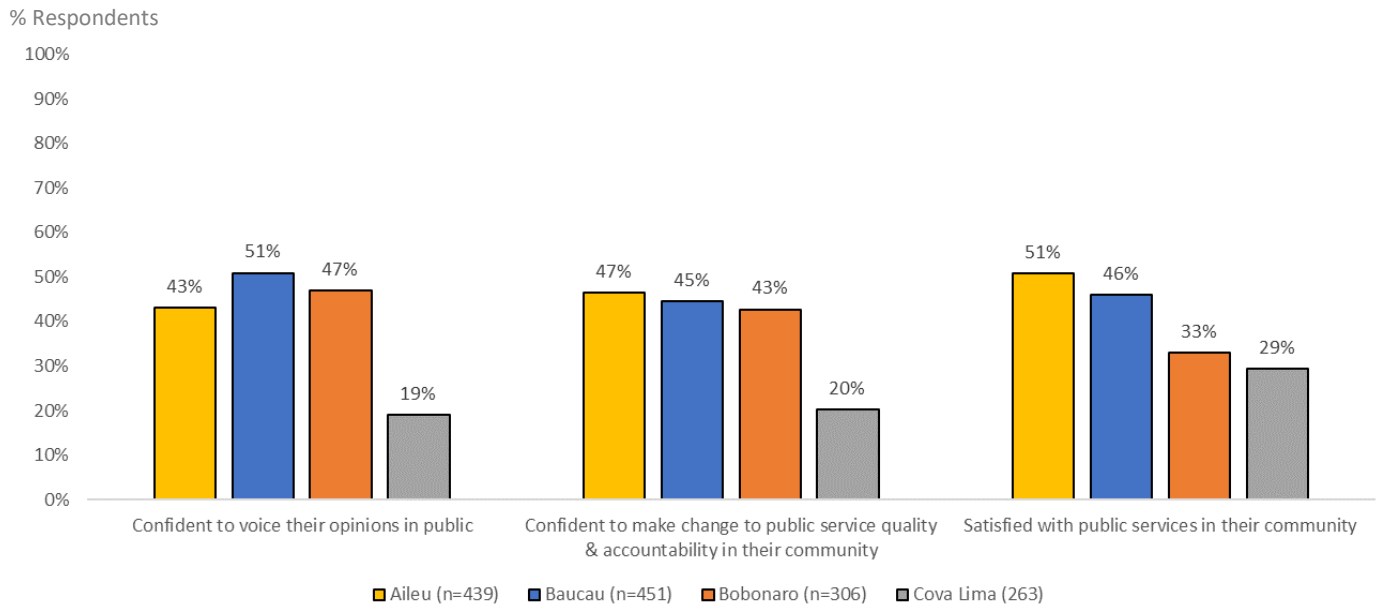



Table 9.5.1 shows a breakdown in rates of satisfaction for each of these four components by project area, and for Aileu, by sex of the respondent. Both both male and female respondents in Aileu report very high rates of satisfaction with health facilities, treatment and personnel in their communities. Rates are also quite high in Baucau, and lowest in Bobonaro and Cova Lima. Interestingly respondents in Cova Lima report higher satisfaction rates with health facilities than health treatment and personnel. Quality of public services in general, such as education, water, roads etc receive some fairly high satisfaction rates in Aileu and Baucau, but low rates in Bobonaro and Cova Lima. Women in Aileu tend to report more favourably in this area than men.

Accountability and transparency of public services rate the lowest, at 55% of respondents satisfied in Aileu (n=439), 50% in Baucau (n=451), 44% in Bobonaro (n=306) and 35% in Cova Lima (n=263). While these rates are low, they are still more positive than previous studies have found for rural areas in 2013 (see Nguyen, Cornwell, Inder and Qu, 2017[40]).

**Table 9.5.1**
**Satisfaction with Components of Public Services**

| | Aileu | | | Baucau | Bobonaro | Cova Lima |
|---|---|---|---|---|---|---|
| Respondent group: | Males | Females | All | All | All | All |
| % reporting satisfaction with regards to: | | | | | | |
| Health facilities in this place | 95.1% | 94.0% | 94.2% | 78.8% | 65.6% | 74.1% |
| Health treatment and health personnel in this place | 95.1% | 92.7% | 93.0% | 79.9% | 62.0% | 64.6% |
| Quality of public services in general, such as education, water, roads, etc. in this place | 67.2% | 75.5% | 74.3% | 70.5% | 48.4% | 51.7% |
| Accountability and transparency of public services in this community | 57.4% | 54.7% | 55.1% | 50.3% | 43.5% | 35.0% |
| All 4 of the above | 52.5% | 50.5% | 50.8% | 45.9% | 33.0% | 29.3% |
| n | 61 | 378 | 439 | 451 | 306 | 263 |

## PSF and their Chickens

The final set of indicators under Outcome 4 relate to PSF and their chickens: number of chickens owned, quantity of eggs produced, number of chickens lost in the 12 months prior, quality of housing and rates of vaccinations. Results for these indicators are given in Table 9.5.2.

**Table 9.5.2**
**PSF and their Chickens**

| | Aileu | | Baucau | | Bobonaro | | Cova Lima | |
|---|---|---|---|---|---|---|---|---|
| | unit | n | unit | n | unit | n | unit | n |
| Average number of chickens owned by PSF | 6.9 | 17 | 6.2 | 6 | 5.8 | 11 | 4.7 | 7 |
| Average (median) number of eggs produced per laying month by PSF's chickens | 12.0 | 15 | 105.0 | 4 | 36.0 | 5 | 38.0 | 6 |
| Average number of chickens lost/died in the last 12 months among PSF raising chickens | 5.4 | 16 | 7.8 | 4 | 4.5 | 10 | 3.7 | 6 |
| % PSF with improved chicken housing | 0.0% | 16 | 0.0% | 4 | 0.0% | 10 | 0.0% | 6 |
| % PSF whose chickens have been vaccinated | 6.3% | 16 | 0.0% | 4 | 0.0% | 10 | 0.0% | 6 |

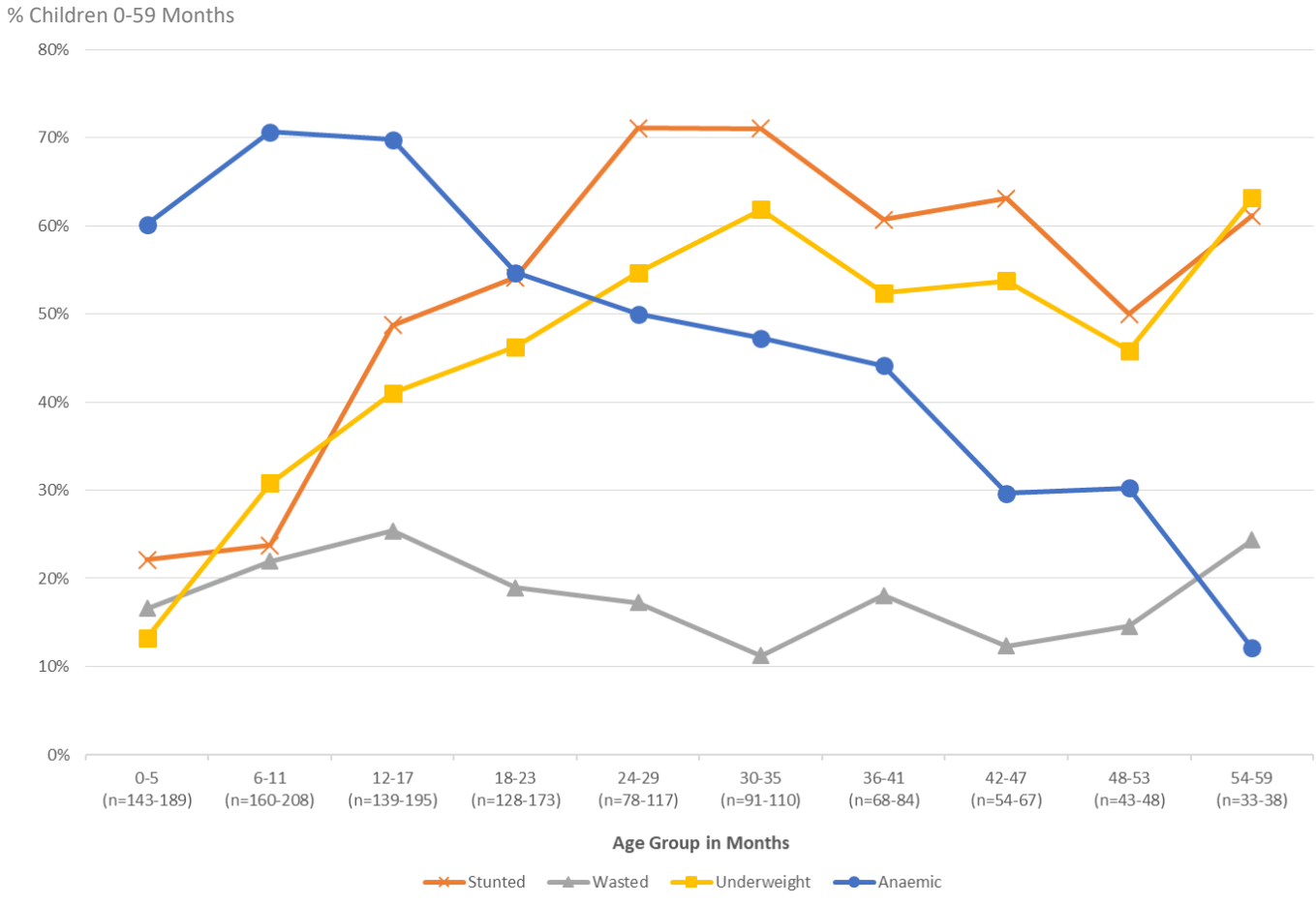
[40] Nguyen, Cornwell, Inder and Qu (2017) «An Economic Perspective on People Movement in Timor-Leste», Monash Centre for Development Economics and Sustainability Research Paper Series on Timor-Leste, RP-TL6-English, Monash University.

Most PSF have fewer than seven chickens and few eggs are produced. The high median number of eggs produced by PSF in Baucau reflects that there were only four PSF interviewed, reporting 24, 60, 150 and 160 eggs produced in a 12-month period. No PSF kept their chickens in secure housing, and none in Baucau, Bobonaro or Cova Lima were vaccinated.

## 10. Confounding Factors

Figure 10 plots the goal-level outcome indicators of under-five stunting, wasting, underweight and anaemia against age of the child in months.

**Figure 10**
**Stunting, Wasting, Underweight and Anaemia[41]**
**By Age of the Child**




The plots highlight a strong link between age of the child and stunting, underweight and anaemia: during the first five months of life, children in project areas of Timor-Leste record relatively low rates of undernutrition in terms of stunting, wasting and underweight, but very high rates of anaemia (60% of children 0-5 months in the sample were anaemic). Wasting appears to increase during the first 12

[41] Combined baseline sample. Anaemia prevalence not collected in Aileu.

months of life, but then falls somewhat from 18 months of age – potentially coinciding with the introduction of a wider range of solids. Rates of stunting and underweight rise rapidly from 6-12 months of age, reaching a peak at around two years of age. Anaemia rates remain high during the first year of life before decreasing quite dramatically as the child ages. The Figure clearly shows some large shifts in child health status within the first 1-2 years of life – coinciding with the notion of 1000-days – and would likely relate closely to the introduction of complementary foods and cessation of breastfeeding.

Econometric models were estimated to further explore the factors that help to explain why the goal-level outcome indicators of stunting, wasting, underweight and anaemia are so low in project areas. While beyond the scope of this report to discuss these in detail, results show the strongest associations relate to household wealth and living conditions, age of the child and location. These factors themselves would be closely related to household income, agricultural production, diet and quality and utilisation of local health services. By seeking to address the barriers in each of these aspects in project areas, WVTL's Better Food, Better Health project is well-set to achieve improvements in the health and nutritional situation of children in target areas of Timor-Leste.

# 11. Conclusions & Recommendations

This baseline has highlighted that the nutrition situation in targeted BFBH project areas is in need of critical intervention. Rates for stunting, wasting, underweight and anaemia in project areas fall well into the WHO's most severe category for public health significance, highlighting the nutrition situation in Timor-Leste is in need of critical intervention, both for the health of its growing young population but also for national health and economic development. Nonetheless, in many cases the degree of anaemia is mild and therefore can potentially be improved with dietary adjustment such as that intended through BFBH.

Dietary diversity among children under five is very poor, with protein sources commonly lacking, particularly upon cessation of breastfeeding. Children in Cova Lima appear most deprived in nutrition indicators. The typical breastfed child in project areas is consuming foods from three food groups, while the typical non-breastfed child is consuming from only two, both of which are well short of the WHO's minimum of four food groups. The directive of BFBH to improve access to and consumption of iron and protein-rich foods is thus of dire importance in Timor-Leste. Consumption of salt, sugar and caffeine is high and consideration should be given to what effect this may be having on iron uptake and overall child health and development. Promotion of plain water in place of other drinks should also be sure to take into account quality of water source.

Households in project areas have a diverse set of living conditions, access to protein-rich foods and agricultural profile. Generally speaking, very few superfood crops are grown and therefore eaten by households, with the exception of mung beans and moringa in Bobonaro. Households in Cova Lima consistently appear to fare worse with regards to superfood consumption and availability. Moringa is grown in Bobonaro and Cova Lima but is virtually non-existent in Aileu and Baucau. Further investigation should be made as to whether moringa is a viable crop in these project areas.

Furthermore, there is very limited sale of superfood crops among those who produce them, prompting the question of what specifically are the barriers to selling these foods. This will need to be explored further in relation to the potential for growing superfood crops. With households predominately eating what they grow, the first-most strategy to improving consumption of these foods is to ensure an improvement in home production and therefore consumption.

The baseline data showed that while many households have chickens, eggs are not produced or obtained frequently and chickens are commonly lost. Eggs are also the most common superfood consumed by children. Improvements in chicken health and egg production and retention has the potential to have marked improvements on child and household nutrition.

Attendance at SISCa in the three months prior to the baseline survey is variable by location, and is worst in Cova Lima where 43% of children under five have never attended SISCa. This suggests a systemic issue that will require coordination with the municipal Ministry of Health to address.

Knowledge of hygiene practices is high, yet the practice of handwashing (as indicated by the availability of soap and water) is low. Investigation will need to be made as to why households do not put this hygiene knowledge into practice. While it may be beyond the scope for BFBH to address water access issues, investigation may reveal some simple community-based means by which to address the barriers.

The most common reason for children to be born at home or without a skilled birth attendant is that the baby "came too quickly". This highlights the importance of developing realistic birth plans – that is, birth plans that acknowledge and address the practical limitations of poor transportation facilities and road access – for expectant mothers.

Traditional gender roles are strong among the target group, and the Aileu data suggests this is particularly so among men. There is, however, clear evidence that domestic violence and harassment is viewed as unacceptable and highlights that education and involvement of men in parents' club activities is needed. The overwhelming response from mothers is that household decisions are made jointly between the man and the woman. While this could indicate equal decision-making, the likely reality is that in fact the decision is dominated more so by the male. As project activities begin to address existing gender norms and the realities become apparent, we may in fact see this indicator begin to appear worse.

In aiming to reduce undernutrition in project areas of Timor-Leste through improved utilisation, access and demand for nutritionally diverse foods – particularly protein-rich foods – and increased production and sales of superfoods, WVTL's Better Food, Better Health project is well-set to achieve improvements in the health and nutritional situation of children in target areas of Timor-Leste.

Specific recommendations coming out of this baseline study are the following:

### 1. Consider prioritising and tailoring 'superfoods' by location.

Within the set of 'superfoods', the nutritional profile varies (in particular protein and iron content), as does the availability and productivity of each which is mostly determined by the agro-geographical

climate, taboos and preferences. 'Superfoods' may need to be prioritised differently – within and across locations – accordingly. In particular, further investigation should be made as to whether moringa is a viable crop in Aileu and Baucau project areas.

### 2. Promote 'superfoods' in everyday cooking, not just special recipes.

In order for 'superfoods' to be eaten daily, they need to be seen as everyday foods that can simply be added to meals using current cooking methods. Recipes that require increased effort or complexity, a second fireplace or long cooking times will not be as readily adopted as the simple message to eat them cooked in whatever way the current meal is being prepared (e.g. plain boiled, steamed or fried).

### 3. Acknowledge (and where appropriate, address) norms and taboos.

As an example, the data suggests that when eggs are available they are eaten by the child rather than the mother, and vice-versa for red kidney beans. 'Superfood' consumption and therefore protein intake and dietary diversity could be achieved through promoting the sharing of these foods between children and mothers. This may require addressing some misconceptions, for example that red kidney beans are not suitable for children, or taboos involving eggs and breastfeeding/pregnant women to ensure that both women and children are consuming adequate protein and in a sense, doubling the number of protein sources that each currently consume.

### 4. Investigate the potential to grow and consume orange sweet potato, as is the practice with cassava.

With a long in-ground cultivation time, cassava and local tubers are often "stored" in the ground and harvested in times of rice shortage. Their vines and leaves are eaten as a green leafy vegetable. Consider whether a similar practice could be adopted for orange sweet potatoes.

### 5. Support PSFs to encourage pregnant women develop realistic birth plans.

The main reason that mothers gave birth at home (without a skilled birth attendant present) was that 'the baby came too quickly' or lack of transport / road conditions. BFBH could support PSFs to help expectant mothers develop realistic birth plans – that is, birth plans that acknowledge and address the practical limitations of poor transportation facilities and road access.

### 6. Investigate why households do not put hygiene knowledge into practice.

Households generally know when they should wash their hands, but soap and water is not commonly available. While it may be beyond the scope for BFBH to address water access issues, investigation may reveal some simple community-based means by which to address barriers to this practice.

### 7. Investigate the preferences and barriers to selling 'superfoods'.

Even in areas where 'superfoods' are more commonly grown, few households report selling them. The example of moringa in Bobonaro is an interesting case in point. Investigation into the specific preferences and barriers to selling these foods should be undertaken, to determine the potential for consumption versus market.

### 8. Include training and promotion of secure chicken housing in group activities.

BFBH provides PSF the incentive of a 'chicken package' – training, improved chicken housing, a rooster, 10 hens and chicken feed. With many households owning chickens and facing severe losses of both

chickens and eggs, large improvements in the availability of eggs for sale and home consumption could be gained through promotion of secure chicken housing at the household level.

9. Consider promoting a reduction in salt, sugar and caffeine in the diets of children.

10. Utilise farmer group monitoring data for production and yield rather than household recall.

Indicators measuring 'superfood' production, land area and yield at the household level may need to be revised as indicators due to inaccurate calculations and estimates. It is recommended to utilise farmer group monitoring data for the purposes of measuring progress towards this outcome. The focus for household-level questioning could shift towards answering the following key questions:

(1) are more HHs growing superfoods?
(2) are more HHs selling them (and is it profitable)?
(3) are HHs eating superfoods?
(4) is all this sustainable (will they continue)?

11. Supplement the quantitatively-heavy baseline with future qualitative studies throughout the project life.

These should focus on exploring norms and gender dynamics in line with the project's gender and disability action plan and the key evaluation questions in Annex 3.

12. Collect individual-level disability (and gender) indicators through monitoring processes.

Since the respondent of interest for the household surveys was the mother or carer of children aged 0-59 months of age, few PLWD were interviewed as part of the Study. As such, individual data on PLWD was not adequately collected. Monitoring data should ensure disability (and gender) data is recorded.

13. Work collaboratively with the Ministry of Health and other development partners in Cova Lima to address systemic issues.

Cova Lima project areas present a particularly poor situation with respect to health, nutrition and availability of food. This may require a more concerted and systematic approach to achieving project goals. In particular, investigation should be made as to why SISCa attendance is so low in Cova Lima, and how the Ministry of Health can best be supported in this area.

14. Work with the Health Education and Promotion Department of the Ministry of Health to develop Information, Education and Communication (IEC) materials aligned with baseline findings.

That is, incorporate information relating to anaemia prevention, and dietary diversity through promoting specific and easy-to access protein-rich foods.

15. Conduct further analysis using the baseline data.

The baseline data is a rich source of information, providing an opportunity for future in-depth analysis to gain a greater understanding of the household nutrition and agricultural practices in Timor-Leste.

# 12. Limitations

The results in this baseline should be considered bearing in mind that data was collected at different points in time: the project started as a pilot project in Aileu municipality in July 2016 with baseline conducted in July 2017, whereas the baseline for expansion districts was conducted in January-March 2018. Thus results will reflect seasonal as well as locational differences.

Agricultural production and household food consumption will likely reflect the agricultural season, so effort must be made to ensure future evaluations take this timing into account. In particular, endlines should be conducted at a similar time of the year to the baseline.

In all locations, the baseline was conducted during the initial project planning period, however in most areas the project had already been socialised with local community leaders and PSF. It had not yet been socialised at the household level.

Results from the baseline data reveal that a larger proportion of the children in the sample are under the age of two. This likely reflects that older children (aged 2-5) are more independent and mobile, and as such the mothers/carers or the children themselves were not home at the time of the survey. With child health indicators quite sensitive to the age of the child, this should be taken into account when making comparisons at midline and endline, or with other studies. It may be necessary to compare indicators across smaller age categories (e.g. 0-23 months and 24-59 months).

Sukus in the baseline sample have a varied history with WVTL programming, and in particular, Cova Lima represents a new location for WVTL. Project experience may change throughout the life of the project as new projects are embarked upon by WVTL. This should be considered in the design of subsequent evaluations.

# 13. Annexes

## Annex 1: Project design document

BFBH ANCP PDD Narrative 31 Oct 2017 (includes logframe and theory of change)

## Annex 2: Baseline evaluation TOR and evaluation plan

Aileu:

Terms of Reference BFBH Baseline 19.05

Better Food Better Health Evaluation Pl

Baucau, Bobonaro, Cova Lima:

TL-BFBH-BBCL Baseline survey-ToR (

## Annex 3: Overall M&E key evaluation questions

| Aspect | Associated Key Evaluation & Learning Questions |
|---|---|
| **Goal:**<br>Children under 5 and their mothers are well nourished | • Have the project's activities led to improvements in the nutritional situation of households, particularly for women and children?<br>• Are women more empowered (involved in / have more choice) in decision-making with regard to use of income and feeding the household?<br>• To what extent do groups (parent, farmer, VSL) support women to access mutually-supportive peer structures (support from other women/parents)?<br>• What are the perceived benefits of the project from the perspectives of key stakeholders and project beneficiaries?<br>• Has the project equitably reached all of the vulnerable groups targeted in the project? |
| **Outcome 1:**<br>Caregivers of under 5 children have improved nutrition, hygiene and health-seeking practices | • Have the project's activities led to improvements in nutrition, hygiene and health-seeking practices?<br>• Are caregivers more knowledgeable and empowered with regards to nutrition, hygiene and health?<br>• To what extent do home gardens impact nutritional outcomes and food security? Are they time and cost effective?<br>• Do men engage in improving household nutrition, and what is the impact of this?<br>• To what extent are nutrition information and cooking demonstration sessions utilised in the home?<br>• To what extent are PSFs conduits to behaviour change? |
| **Outcome 2:**<br>Households have improved access to superfoods | • Can households / communities get superfoods when they want them – are superfoods more commonly grown by communities, more readily available in local markets, and wasted less due to inadequate storage?<br>• Does improved housing and vaccinations reduce chicken/egg losses?<br>• Has the project helped households / communities to increase production and yield of superfoods?<br>• How effective are demonstration plots in initiating behaviour change? |
| **Outcome 3:**<br>Households have increased income from superfood production | • Have the project's activities led to an increase in income for households? Is this experience shared for households with vulnerable persons (female-headed households, households with people with a disability)?<br>• To what extent has the project facilitated superfood-producing / processing households to engage in the market?<br>• Do producer groups facilitate collective purchasing and marketing?<br>• What is the value-add of agricultural processing of superfoods?<br>• Do improvements in income / increases in agricultural production lead to improved nutrition?<br>• To what extent do VSL groups fill a necessary gap in access to financial services? What are VSL loans used for?<br>• Are VSL members able to repay their loans? |
| **Outcome 4:**<br>Improved sustainability of health and agriculture services | • What is the role of CVA groups in advocating for improved health and agriculture services for communities?<br>• To what extent do CVA activities empower communities (particularly women and vulnerable persons) to feel heard and empowered?<br>• What are the key contributions of learnings from project activities and outcomes to the broader stock of knowledge and development community?<br>• What are the synergies between nutrition-sensitive agriculture and FMNR? |

| | |
|---|---|
| Implications for scale-up | • To what extent can villages in other agro-economic zones (including geographic proximity to borders / rivers / major roads) benefit from project activities?<br>• What is the role and capacity of government departments for scale-up? |
| Barriers & enabling factors | What is the role of:<br>• Equipment?<br>• Infrastructure and transportation / location?<br>• Water / climate?<br>• Crop type?<br>• Education / knowledge / training?<br>• Participation in groups?<br>• Preferences for crop production for sale or consumption?<br>• Gender norms |
| Unintended consequences | • How is increased income spent? Is it controlled by certain household/community members?<br>• Are methods time/physically burdensome? How does this affect the division of labour both in and outside the home, and how is the workload of women affected and managed?<br>• Have there been any participant or community backlash to the project involvement of women and PWDs, or to men who become involved in domestic tasks beyond traditional male roles?<br>• Are outcomes sustainable in the longer term?<br>• Are the most vulnerable participating and benefitting? |

## Annex 4: Baseline data collection tools

Aileu:


BFBH Baseline Household Survey 02.


BFBH Baseline PSF Survey 31.05.2017.doc


BFBH Baseline Location Survey 31.05

Baucau, Bobonaro, Cova Lima:


BBCL BFBH Tools Tetun and English 26.


BFBH Baseline PSF Survey 31.05.2017-EP


BFBH Baseline Location Survey 31.05

## Annex 5: Baseline sample size by aldeia


Sample size by aldeia.xlsx

## Annex 6: Project ITT and beneficiaries sheets


TL-BFBH ITT Baseline 03.07.18.xlsx

## Annex 7 WVTL Response