Livelihood Profiles

Three Livelihood Zones in
Palu, Donggala and Sigi Districts
Central Sulawesi, Indonesia

Assessed Using Rapid Household Economy Analysis (HEA)
April 2019

Report Prepared by:
Alexandra King
ACKNOWLEDGEMENTS

This Rapid HEA (household economy analysis) was funded by the Disasters Emergency Committee (DEC) and Tear Fund and was undertaken for Yayasan Sayangi Tunas Cilik (Save the Children Indonesia) and Yayasan Fondasi Hidup (FH Indonesia) in March – April 2019. The following people dedicated three weeks to the exercise:

<table>
<thead>
<tr>
<th>Yayasan Sayangi Tunas Cilik (Save the Children Indonesia)</th>
<th>Yayasan Fondasi Hidup (FH Indonesia)</th>
<th>Food Economy Group (FEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyaw Oo Maung</td>
<td>Novita H. Lenahatu</td>
<td>Alexandra King</td>
</tr>
<tr>
<td>Hendrik Muntu</td>
<td>AHM Kamruzzaman</td>
<td></td>
</tr>
<tr>
<td>Jamal Fida</td>
<td>James Patrick Alonzo</td>
<td></td>
</tr>
<tr>
<td>Mery Ana Farida</td>
<td>Liberson Frain Sitanggang</td>
<td></td>
</tr>
<tr>
<td>Meliana</td>
<td>Josua J. Sinaga</td>
<td></td>
</tr>
<tr>
<td>Martin Tarigan</td>
<td>Gunawan Panjaitan</td>
<td></td>
</tr>
<tr>
<td>David Ferdinan Bawias</td>
<td>Damai Ryanti Purba</td>
<td></td>
</tr>
</tbody>
</table>

Many thanks are due to the community leaders and community members who agreed to spend long hours with the teams.
TABLE OF CONTENTS

Acknowledgements ......................................................................................................................... 2
Table of contents ............................................................................................................................ 3

A  Background to the Rapid HEA .................................................................................................... 4
B    Methodology................................................................................................................................ 4
C  Livelihood Zone Summaries ........................................................................................................ 5
D  Livelihood Zone Comparisons ..................................................................................................... 7
D.1  Reference Year .......................................................................................................................... 7
D.2  Food sources .............................................................................................................................. 8
D.3  Sources of cash income .............................................................................................................. 8
D.4  Total income (food + cash) ........................................................................................................ 9
D.5  Expenditure patterns .................................................................................................................. 10
D.6  Hazards and response strategies ............................................................................................... 11
E  Shock analysis: earthquake .......................................................................................................... 11
E.1  Shock analysis principles .......................................................................................................... 11
E.2  The projected impact of the September 2018 earthquake on livelihoods ............................ 13
E.3  Sigi Upland Agriculture Livelihood Zone – Current year scenario .................................... 14
E.4  Donggala Coastal Fishing Livelihood Zone – Current year scenario .................................... 16
E.5  Palu Inland Irrigated Agriculture Livelihood Zone – Current year scenario .................... 18
F  Implications for Programming .................................................................................................... 20

SIGI UPLAND AGRICULTURE LIVELIHOOD ZONE PROFILE......................................................... 22

DONGGALA COASTAL FISHING LIVELIHOOD ZONE PROFILE......................................................... 35

PALU INLAND IRRIGATED AGRICULTURE LIVELIHOOD ZONE PROFILE......................................... 45

Annex: Notes on HEA-based interviews in Sangurara displaced settlement ................................. 55
A Background to the Rapid HEA

On 28 September, a series of earthquakes struck Indonesia’s Central Sulawesi province, the strongest of which was a 7.4M earthquake only 10 km deep and with its epicentre close to the provincial capital, Palu. The earthquake triggered a tsunami striking beaches in Palu and Donggala. The earthquakes, tsunami and resulting liquefaction and landslides caused significant damage and loss of life. As of 21 December, 2,101 people are known to have died, 1,373 people have been reported as missing and the number of IDPs stands at 133,631 people. The report from the Centre for Disaster Data and Information (PUSDATINA) of Central Sulawesi Province on 20 December 2018 confirmed a need for 20,257 shelters to be built in 207 IDPs sites.

Across the three main livelihood zones – coastal, inland and upland – the earthquake has severely affected the fishing and agriculture sectors, and damaged key market infrastructure and SME/income generating assets. Basic short-term food needs have been met by the Government of Indonesia and other actors; however, loss of income and reduced purchasing power pose a risk to food security for vulnerable households. Reduced financial access to food will complicate already troubling child nutrition - results of a nutrition surveillance established by the Ministry of Health (PSG 2017) unveiled GAM exceeded the WHO crisis classification threshold for “serious” (10%).

Basic needs in all sectors, especially shelter, will continue to place stress on household economy, forcing caretakers to make difficult decisions about the allocation of scarce resources, increasing risks to child wellbeing such as child marriage or labour. Household food and economic insecurity will persist until productive assets, income sources and livelihoods are restored.

The overall objectives of this Rapid HEA (household economy analysis) are to assess the food security and livelihoods needs of Central Sulawesi Earthquake and Tsunami affected population, alongside relevant market analysis, in SC operational areas of Central Sulawesi; and to inform strategic decisions and scale up for livelihood recovery programming.

The Indonesia Earthquake and Tsunami response will be transitioning into a recovery phase on 1 April 2019. Initial FSL assessment and market studies conducted during the relief stage need to be updated and more in-depth livelihood and market analysis conducted to better understand recovery needs and gaps. Broadly, this assessment will also seek to identify the impact of income and food security on our intended recovery outcomes for children through livelihoods analysis that can inform the understanding of recovery needs in other sectors. Analysis will also include consideration of shelter recovery needs and how this can impact the stabilisation of HH economy. Wherever possible, data collection and analysis will consider the specific impact of food and economic security on children.

The rapid HEA aims to provide insight into partner agencies’ recovery and reconstruction work as a way to better understand which livelihood profiles need recovery support, specify what that support is, as well as give a better understanding of the level of food insecurity and livelihood vulnerability in the earthquake and tsunami affected areas.

B Methodology

A rapid HEA is not a substitute for a fuller HEA but is an adaptation of it for emergency response when a full HEA baseline is not available.

The methodology was essentially a normal HEA baseline assessment with the following differences: three days of classroom training for the field team instead of five or six days, which included tailoring the interview forms and spreadsheets to the local context; six days of fieldwork per livelihood zone instead of 10-12 days; five villages visited per livelihood zone instead of 8-12 villages; current year monitoring information gathered in addition to HEA baseline information for a reference year; and two days instead of at least four days to analyse reference year information, compile bullet points for the report, set up a single zone analysis spreadsheet, and run the earthquake / current year scenarios.

---

1 This section is taken from the TOR for the Rapid HEA.
Most of the field data was collected directly at village from community key informants and focus groups through lengthy semi-structured interviews. Interviews were also conducted with traders. For more information on the Household Economy Analysis framework and methodology, please see the following resources:

1. **HEA Guide for Programme Planners and Policy Makers:**

2. **HEA Practitioners’ Guide:**

3. **HEA Animation (7 minutes):**

In addition to the differences between full and rapid HEA, there were some other limitations to this exercise:

- A formal livelihood zoning was not carried out prior to the start of fieldwork and the team covered a limited geographical spread within each livelihood zone. YSTC and YFH were mainly interested in their intervention villages, so the team categorised these into three livelihood zones: Sigi Upland Agriculture, Donggala Coastal Fishing, and Palu Inland Irrigated Agriculture. The team found some diversity within livelihood zones in terms of both the pre-earthquake situation (related to market and land access) and the post-earthquake situation (impact), particularly in the Palu Inland Irrigated Agriculture Livelihood Zone, which may need to be split following a formal livelihood zoning.

- The team faced difficulties in getting participation from the better off wealth group (in all zones, but especially in the fishing zone) and women (in the fishing and irrigated paddy zones). This affects understanding of who employs labourers and of expenditure patterns.

- There was limited time to interview large traders to fully understand market trade routes. However, other assessments have been conducted in this area.

### C Livelihood Zone Summaries

The following tables provide a brief summary of the characteristics of each livelihood zone. They are followed by a more detailed comparison of the zones and then a profile per livelihood zone.

#### Sigi Upland Agriculture Livelihood Zone

<table>
<thead>
<tr>
<th>Crops</th>
<th>Cacao</th>
<th>Durian</th>
<th>Rice</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This livelihood zone is located in upland areas of Sigi District where cash crops dominate and most households own land. It used to be a coffee-dominant area, but in recent decades cacao has been the main crop. Farmers now suggest that cacao is in decline (due to the age of trees, sub-optimal maintenance and disease) and have been planting durian in recent years. Some households grow paddy in lowland areas where irrigation systems channel mountain water sources, mostly for own consumption. A variety of vegetables are also grown, also mostly for own consumption.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income Sources</th>
<th>Crop sales</th>
<th>Casual labour</th>
<th>Self-employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The main casual labour activities are in agriculture and construction. Self-employment activities include petty trade, kiosks, prepared food sales, ojek, sand and stone sales. Pine sap tapping is very important in one of the villages visited.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Chickens</th>
<th>Pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main determinant of wealth in this livelihood zone is the size of land area cultivated, along with type of off-farm activity (people with salaries are generally in the better off wealth group). Land areas owned are larger than land areas cultivated. There are a few landless households, but this was not typical for any wealth group. Livestock are kept in very small numbers and most households own only chickens. Pig fattening is more common in the middle wealth group in Christian</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Different crops were affected in different ways, but farmers generally neglected their trees and fields in the months after the earthquake. Landslides have reduced land areas cultivated in some villages. Many houses, schools, clinics, government buildings, roads, piped water and irrigation systems were damaged. 

Villages visited: Salua, Bolodangko, Tangkulowi, Sungku, Namo (all in Kulawi Sub-District).

### Donggala Coastal Fishing Livelihood Zone

<table>
<thead>
<tr>
<th>Income Sources</th>
<th>Fishing</th>
<th>Fishing labour</th>
<th>Casual labour</th>
<th>Self-employment</th>
<th>Safety nets</th>
</tr>
</thead>
<tbody>
<tr>
<td>This livelihood zone is located in coastal areas of Donggala District where fishing is the dominant income-generating activity, supplemented by casual labour and self-employment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealth is determined by the type of boats and engines and other fishing equipment owned. The ‘better off’ (owners of large boats) are a small percentage of the population and were not met by the team. Households that did not own a boat shared boats with others or worked as fishing labour (earning a share of the catch).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some households own land, but crop production was not common in the reference year. Some have started planting cloves in recent years and will start harvesting in future.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few livestock are kept, apart from chickens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The main casual labour activities are in agriculture and construction. Access to markets varies considerably in the villages that were visited, with some close to the main road and others quite distant.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many fishermen lost boats, other fishing equipment, homes and belongings during the tsunami that followed the earthquake at the end of September 2018. Demand for fish from tsunami-affected waters decreased. Peak fishing spots have moved.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villages visited: Tompe, Tanjung Padang, Labean, Walandano, Manimbaya. (Where the inland agriculture livelihood zone was also present in a village, the team visited the fishing sub-villages.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Very few Coconuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Few livestock are kept, apart from chickens.</td>
<td></td>
</tr>
<tr>
<td>The main casual labour activities are in agriculture and construction. Access to markets varies considerably in the villages that were visited, with some close to the main road and others quite distant.</td>
<td></td>
</tr>
<tr>
<td>Many fishermen lost boats, other fishing equipment, homes and belongings during the tsunami that followed the earthquake at the end of September 2018. Demand for fish from tsunami-affected waters decreased. Peak fishing spots have moved.</td>
<td></td>
</tr>
<tr>
<td>Villages visited: Tompe, Tanjung Padang, Labean, Walandano, Manimbaya. (Where the inland agriculture livelihood zone was also present in a village, the team visited the fishing sub-villages.)</td>
<td></td>
</tr>
</tbody>
</table>

### Palu Inland Irrigated Agriculture Livelihood Zone

<table>
<thead>
<tr>
<th>Crops</th>
<th>Rice</th>
<th>Corn</th>
<th>Vegetables</th>
<th>Coconuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>This livelihood zone is located in lowland, inland areas of Donggala and Sigi Districts close to Palu City, where irrigated farming is practiced. There are multiple agricultural production seasons per year and the main crops grown are rice, corn, vegetables, coconuts. Cattle, chickens and goats are the main livestock types kept, all in relatively small numbers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The main determinant of wealth is land area cultivated. The poorest households are landless labourers. There are large landowners (resident or absentee) who the team did not meet, accounting for much employment of labour. Sharecropping and land rental – under various arrangements – are common.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The main casual labour activities are in agriculture and construction. Self-employment activities include petty trade, kiosks, prepared food sales, ojek. Most farmers sell their crops and livestock directly to traders at village level. Market access is generally good in this livelihood zone, due to close proximity to Palu town.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farming has been greatly affected by the earthquake in areas where the irrigation system has been damaged. Even where the irrigation system was not damaged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Livestock
- Cattle
- Goats
- Chickens

(or was quickly repaired), farmers generally lost a season of production due to the earthquake and subsequent shocks. Many houses, schools, clinics, government buildings, roads, piped water and irrigation systems were damaged by the earthquake and resulting liquefaction.

Villages visited: Labuan, Lero Tatari, Lolu, Sibalaya, Pombewe. (Where the fishing livelihood zone was also present in a village, the team visited the agricultural sub-villages.)

D Livelihood Zone Comparisons

D.1 Reference Year

In HEA, baseline information is gathered for a reference year, which is a consumption year, starting with the period of main production or just after the end of the hunger/lean season. The concept of a ‘lean season’ was not understood in these three livelihood zones.

The consumption year for the Palu Inland Agriculture LZ was unclear because there are multiple harvest periods through the year and no lean season. The team decided to use the 12-month period immediately before the earthquake as the reference year (October 2017 to September 2018). It was ranked as an above average year.

The consumption year for the North Donggala Coastal Fishing LZ starts with the start of the peak fishing season in ~March. The reference year was the last full consumption year before the earthquake: March 2017 to April 2018. It was ranked as an above average year.

The consumption year for the Sigi Upland Agriculture LZ starts with the main harvest of the main crop (cacao) in ~April. The reference year was the last full consumption year before the earthquake: April 2017 to March 2018. It was ranked as an average to above average year.

The following graphic places the reference year in relation to the earthquake year and/or current year for each livelihood zone.
D.2 Food sources

The graphic above compares the sources of food in the reference year for households in different wealth groups and in different livelihood zones.

Households obtained most of their food from a combination of market purchases, own crop production, and fishing. Crop production (in dark green) was an important source of food for most households in the Palu Irrigated and Sigi Upland Agriculture Livelihood Zones, but not for very poor households in these zones, which relied mainly on market purchase. Market purchase of food was also the main source in the Donggala Fishing Livelihood Zone, supplemented by own fishing. Other small food sources were wild foods (mainly freely available coconuts), rice from the Bulog programme, livestock products (small quantities of consumed own meat), gifts (mainly bananas and vegetables from neighbours) and payment in kind (lunches provided to casual labourers in some areas).

In all livelihood zones, market purchases were dominated by staple food (primarily rice), both in terms of the amount of money spent and in terms of kilocalorie contributions. Other commonly purchased foods included fish (fresh, dried, canned), vegetable oil, sugar, vegetables, tofu, tempe, noodles, eggs, condensed milk, cassava, sweet potatoes, fruit, coconuts and chicken. Approximately 60-70% of annual kilocalories were obtained from produced or purchased rice, across all wealth groups.

D.3 Sources of cash income

The graphics below compare the sources of cash income in the reference year for households in different wealth groups and in different livelihood zones. The first graph compares the proportions of income from different sources, while the second graph compares absolute levels of income from different sources.

The importance of crop sales increased with wealth in the reference year in the two agricultural livelihood zones. Casual labour was the most important income source for poorer households in these zones. Income from fishing (which includes fishing labour) was the most important income source in the Donggala Fishing Livelihood Zone. Salaried employment was an important income source for the better off households that were met in the Sigi Upland Livelihood Zone. Livestock sales were important in the Palu Irrigated Agriculture Livelihood Zone and less important in the other two livelihood zones. The cash transfers in the reference year were from the government PKH programme.
D.4 Total income (food + cash)

The graphics in this section present total income (food plus cash). Total income is expressed as a percentage of minimum food requirements, with cash income converted into its food equivalent based upon the staple food price. Within each wealth group, the levels of total income were notably quite similar. The exception to this was the better off wealth group, although it should be noted that the largest differences in income were obtained for this group and it was difficult to get access to the genuinely better off. The team may have met the lower end of this wealth group (and in the case of the fishing zone, did not meet them at all).
D.5 Expenditure patterns

The graphic below compares expenditure patterns in the reference year for households in different wealth groups and in different livelihood zones. The proportion of income spent on staple and non-staple food declined with wealth during the reference year. Across all livelihood zone, very poor households spent 40-50% of total expenditure on food items, while better off households spent 20-30%.

‘HH items’ includes spending on salt, hygiene items, electricity, and LPG. ‘Social services’ includes spending on education and health care. The largest item of expenditure in this category is pocket money for school children. ‘Inputs’ includes agricultural inputs (seeds, tools, labour, fertilizer, transport) in the farming livelihood zones and fishing inputs (boat and net repairs, other fishing equipment, batteries, transport, fuel) in the fishing livelihood zone. ‘Other’ includes religious contributions, condiments, cosmetics, savings, etc. The cigarettes category is self-explanatory and starts at IDR 10-15,000 per day for very poor households.

During wealth group interviews, the teams separated out the clothing and health care expenditure categories into spending on adults and spending on children. Overall, about 50-60% of expenditure on clothing was for children across all wealth groups. For expenditure on health care, about 50-70% was for children. In the social services category, 90-100% of expenditure was on education costs rather than on health costs. Within education expenditure,
60-75% of expenditure was on daily pocket money for children. Across all livelihood zones, absolute expenditure increased with wealth for all categories of expenditure.

D.6 Hazards and response strategies

The recent extremely severe earthquake with tsunami and liquefaction is an infrequent hazards in the three livelihood zones, but was devastating when it happened. Less severe earthquakes are quite common. Landslides linked to earthquakes and heavy rainfall are frequent hazards in the Sigi Upland Agricultural Livelihood Zone, as are flash floods. Crop pests are a chronic hazard in the agricultural zones. Key informants also complained of drought, affecting crop production in some years. A more regular hazard for fishermen is seasonal: the large waves, strong winds and high tides that occur in November-December each year.

Common household response strategies to deal with hazards include the following.

**Switching expenditure** – Reducing expenditure on expensive, less essential items in order to purchase food and other essential items is a commonly used coping strategy pursued by all wealth groups in all livelihood zones. For example, households increase their purchase of sago flour in bad years in the Donggala Coastal Fishing Livelihood Zone, which is less expensive than rice.

**Expanding casual labour** – Households seek additional casual labour opportunities in difficult times, both locally and through migration. However, many people were reluctant to migrate in the initial months after the earthquake – partly because of the requirement to rebuild their homes – and a preference to remain close to home due to fear/trauma. The expansion of construction work in recent months has provided an opportunity for casual labourers, which now includes men from all wealth groups.

**Switching crops** – When irrigation systems are disrupted, farmers in the Palu Irrigated Agriculture Livelihood Zone switch from producing rice to producing corn or other crops that can be grown without irrigation. A strategy to cope with the gradual decline in cacao production in the Sigi Upland Agriculture Livelihood Zone in recent years is to plant durian as a new cash crop. However, this is a long-term strategy because the trees take about five years to reach maturity and bear fruit.

**Sharing boats** – In the Donggala Coastal Fishing Livelihood Zone, this is a normal strategy for very poor households that do not own boats and has become more widely practised after the earthquake/tsunami.

**Borrowing** – Casual labourers request payments in advance when facing difficult times or obtain expenditure item on credit from kiosks. There is a limit to which this strategy can be used when households in all wealth groups are facing problems.

E Shock analysis: earthquake

E.1 Shock analysis principles

Three types of information are combined for HEA scenario analysis: information on baseline access, information on a hazard or change (i.e. factors affecting access to food/income, such as crop production, fish production or market prices) and information on coping strategies (i.e. the sources of food and income that people turn to when exposed to a hazard). The approach can be summarised as:

**Baseline + Hazard + Coping = Outcome**

The output from an outcome analysis is an estimate of total food and cash income for a projected period, once the cumulative effects of current hazards and income generated from coping strategies have been taken into account. The next step is to compare projected total income against two clearly defined thresholds to determine whether an intervention of some kind is required.

The two thresholds – the **Livelihoods Protection Threshold** and the **Survival Threshold** – are described below. The **Survival Threshold** is the amount of food and cash income required to ensure survival in the short-term, i.e. to cover minimum food and non-food needs. Minimum non-food needs include the costs of preparing and consuming food (including LPG, electricity, soap, and salt) plus any cash expenditure on water for human consumption. For the baselines included in this report, the staple food basket includes rice, noodles, eggs, fresh fish, tofu, tempe, vegetable oil, sugar and vegetables.
The *Livelihoods Protection Threshold* is the amount of food and cash income required to protect local livelihoods. This means a level of income that gives people the option to maintain expenditure on basic non-food goods and services at the levels prevailing in the reference year. This does not mean that people will have exactly the same standard of living as in the reference year (since the livelihoods protection basket excludes non-essential items such as cigarettes), nor that they will pursue exactly the same activities as in the reference year. But it does mean that – provided they prioritise these items – people can continue to spend similar amounts of money on inputs for crop and livestock production and on health and education as in the reference year.

### An Example of an Outcome Analysis for Poor Households from the Wolayita Maize and Root Crop Livelihood Zone in Southern Ethiopia

Three types of quantitative data are combined to predict outcome: data on baseline sources of food and cash, data on the hazard and data on coping strategies.

First of all, the effects of the hazard on baseline sources of food and cash income are calculated (middle bar in the chart).

Then the effect of any coping strategies is added in (right-hand bar).

The result is an estimate of maximum total food and cash income for the current year.

**Note:** In this graphic, food and cash income have been added together and, in this case, expressed in food terms. (The results could also be expressed in cash terms).

Besides these essential non-food goods and services, the *Livelihoods Protection expenditure basket* contains a number of items that – while not absolutely essential for survival – are nonetheless considered essential in terms of sustaining a minimum locally acceptable standard of living. It is usually quite easy to identify these items through discussions with local key informants. The exact composition of the Livelihoods Protection Basket will vary from livelihood zone to livelihood zone, depending upon local circumstances.

Another important point about the *Livelihoods Protection Threshold* is that, as defined here, it is set relative to local conditions rather than relative to international standards, such as Sphere, although different thresholds can be developed as required.
Comparison of Projected Income against Two Clearly Defined Thresholds

Projected total income (including income from coping) is compared against two thresholds defined based on local patterns of expenditure.

The Survival Threshold represents the total income required to cover:

a) 100% of minimum food energy needs (2100 kcal per person), plus

b) the costs associated with food preparation and consumption (i.e. salt, soap, LPG for cooking and electricity), plus

c) any expenditure on water for human consumption.

Note: Items included in categories b) and c) together make up the minimum non-food expenditure basket, represented by the brown bar in the expenditure graphic.

The Livelihoods Protection Threshold represents the total income required to sustain local livelihoods. This means total expenditure to:

a) ensure basic survival (see above), plus

b) maintain access to basic services (e.g. routine medical and schooling expenses), plus

c) sustain livelihoods in the medium to longer term (e.g. inputs for crop production or fishing, depending on the livelihood zone, including transport) plus

d) achieve a minimum locally acceptable standard of living (e.g. purchase of basic clothing, condiments, coffee, hygiene items beyond basic soap etc)

Regarding coping strategies, it is not usual to include every possible strategy in the calculation of outcome. This would have the effect of minimising and almost certainly under-estimating the need for assistance as measured by the deficit. Instead, only those strategies that are appropriate responses to local stress are included. In this context, appropriate means both ‘considered a normal response by the local population’ and ‘unlikely to damage local livelihoods in the medium to longer term’. In HEA, therefore, the most important characteristic of a coping strategy is its cost, where cost is measured in terms of the effect on livelihood assets, on future production by the household, and on the health and welfare of individual household members. Note that cost is not just a function of the type of activity, but the extent to which it is utilised. High cost strategies (i.e. damaging) are not included in the analysis.

E.2 The projected impact of the September 2018 earthquake on livelihoods

Scenarios for the earthquake year and current year have been developed for each livelihood zone, based on the timeline that was presented earlier:
Many houses, schools, clinics, government buildings, roads, piped water and irrigation systems were damaged by the earthquake, tsunami and liquefaction at the end of September 2018 in the villages visited as part of this assessment. Farming has been greatly affected in areas where the irrigation system has been damaged. Apart from the impact on irrigation systems, farmers generally neglected their farming activities – and all income-generating activities – in the months following the earthquake. This was because they were busy rebuilding shelters and also because of fear and trauma. In the coastal fishing zone, fishing boats and equipment were swept away or damaged by the tsunami. Fishermen also generally neglected all income-generating activities in the months immediately after the earthquake/tsunami. There was little market for their fish in any case immediately after the tsunami because households initially did not want to consume fish from tsunami-affected waters.

Many organisations, government departments and private companies have been providing assistance in the area since the earthquake. Much work has been done to provide temporary solutions for damaged homes, schools, clinics, water supplies and public toilets. The government restored electricity and temporary shelters are connected. Some assistance has already been provided in the agriculture sector in terms of seeds and other inputs for farmers, small-scale and short-term irrigation, as well as cash-for-work for agricultural labour (so that farmers can work on their own fields rather than having to work elsewhere for urgently needed daily cash). Some fishing equipment has been supplied to fishermen, but replacement boats have not yet been provided.

Each livelihood zone profile contains a description of

E.3 Sigi Upland Agriculture Livelihood Zone – Current year scenario

The scenario developed for the current year (April 2019 to March 2020) is based on most households having returned to their farming work in recent months. Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the current year incorporates the following elements:

Crop production:
- Crop maintenance was neglected in the months after the earthquake and farmers have only recently restarted agricultural activities. The expected decrease in annual cacao production this year compared to the reference year is estimated at 30%.
- For paddy/rice, most irrigation systems are now working again, but some problems remain and capital for inputs is lacking. The expected decrease in the first season is 50% and in the second season is 25% compared to the reference year.
- Other crops seem to be largely back to normal.

Labour/self-employment/other:
- Agricultural labour reduced by 50% compared to the reference year (because of lack of capital).
- Construction labour increased by 25% (because of reconstruction activities).
- Self-employment/salaries/businesses largely back to normal.
- Pig fattening income has been removed from the projection (due to lack of capital to restart).

Market prices:
• There are no major market price changes compared to the reference year.

Assistance:
• Food and cash assistance is not included in this scenario (because most organisations haven’t planned such assistance and in order to project possible need).

Note:
• This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in three wealth groups (for all four wealth groups, please see the profile for this livelihood zone that follows). The impact of the earthquake is felt more fully in this annual scenario than in the earthquake year scenario (see separate profile), particularly in the absence of food/cash assistance. Very poor households in particular look likely to struggle to reach the livelihood protection threshold (the level of deficit illustrated below is approximately IDR 3,600,000). They were heavily dependent on agricultural labour in the reference year. The large decrease for middle households is partly because of the removal of pig fattening income.

A livelihood protection deficit represents an emergency situation whereby households cannot afford many basic things that they spent money on in the reference year, including education, health, and productive inputs. Faced with this situation, they may make a choice to purchase some items in the livelihood protection basket in preference to staple food, thus also going hungry.

The current year scenario above does not take into account the problem of shelter. Many households have built temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. In the graphs below, this cost has been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes. This revised livelihood protection threshold remains unaffordable to most wealth groups during the current year. The levels of deficit are extremely large for the poorer households.
wealth groups, indicating that it will be difficult, if not impossible, for households to rebuild their homes without external support.

E.4 Donggala Coastal Fishing Livelihood Zone – Current year scenario

The scenario developed for the current year (March 2019 to February 2020) is based on most households having returned to fishing in recent months, sharing boats where possible. Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the current year incorporates the following elements:

Fishing:
- Boat losses approach 70% in the more affected fishing villages, but they are being shared and more frequently used. Peak fishing areas have moved since the tsunami. The estimated fishing income decrease this year is 55%. Note that the less affected villages (Walandano and Manimbaya in Balaesang Tanjung Sub-District) will have a less severe loss of fishing.

Labour/self-employment/other:
- Agricultural labour returns to normal (or could increase because cloves trees in the area are maturing).
- Construction labour increased by 25% (because of reconstruction activities).

Market prices:
- There are no major market price changes compared to the reference year.

Assistance:
- Food and cash assistance is not included in this scenario (because most organisations have not planned such assistance and in order to project possible need).

Note:
- This scenario can be revised and other assumptions can be modelled on request.
Given this scenario, the following figures present the results for households in three wealth groups. The impact of the earthquake is felt more fully in this annual scenario, particularly in the absence of food/cash assistance. Very poor and poor households in particular look likely to struggle to reach the livelihood protection threshold (the levels of deficit illustrated below are approximately IDR 3,300,000 and IDR 1,000,000 respectively). Middle households are also likely to see a large decrease in total income.

Current year scenario analysis (without shelter/boat/engine costs) – Donggala Coastal Fishing

![Graphs showing current year analysis](image)

**Note:** The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold. The ‘food aid/safety nets’ portion represents food and cash transfers.

The current year scenario above does not take into account the problem of shelter or loss of boats experienced in this livelihood zone. Many households have built temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. Boat and engine costs have been estimated at $350-550 per household, depending on wealth group. In the graphs below, these costs have been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes and boats. This revised livelihood protection threshold remains unaffordable to most wealth groups during the current year. The levels of deficit are extremely large for the three wealth groups, indicating that it will be difficult, if not impossible, for households to rebuild their homes or purchase boats without external support.
E.5 Palu Inland Irrigated Agriculture Livelihood Zone – Current year scenario

The analysis for the current year incorporates the following elements for the ‘more affected’ villages (where irrigation systems have not been restored). Any aspect of this analysis and any assumption made can be revised and updated based on better information. The scenario does not apply to households that have lost their homes and their land and are now living outside the livelihood zone in displaced camps.

Crop / livestock production:
- Both paddy/rice seasons are not cultivated in the current year.
- The first corn and vegetable production seasons were not cultivated, with gradual recovery in seasons 2 and 3.
- Livestock production largely unaffected.

Labour/self-employment:
- Agricultural labour reduced by 75% (because of the decline in crop production)
- Construction labour increased by 25%. Very poor households switch from agricultural labour to construction labour.
- Better off use savings to engage in self-employment.
- Petty trade increased by 20%.

Market prices:
- After a short period of disruption, prices returned to pre-earthquake levels.

Assistance:
- Approximately 2 months of food assistance across wealth groups and 3 months of hygiene items.
- Approximately IDR 3m cash for most households.
Note:
- This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in three wealth groups (for all four wealth groups, please see the profile for this livelihood zone that follows). Households experienced a large drop in total income (combining food and cash), somewhat compensated by the large quantities of assistance provided. All wealth groups fell below the livelihoods protection threshold without assistance. With assistance, they likely remained above the livelihoods protection threshold, but this is dependent on construction labour having expanded. The availability of construction labour in the period through September 2019 (and beyond) should be monitored.

The current year scenario above does not take into account the problem of shelter. Many households have built temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. In the graphs below, this cost has been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes. This revised livelihood protection threshold remains unaffordable to all wealth groups during the current year. The levels of deficit are extremely large for most households, indicating that it will be difficult, if not impossible, for them to rebuild their homes without external support.
Implications for Programming

The final section of each livelihood zone profile outlines recovery priorities that were generated by the community leader and wealth group interviewees themselves. These suggestions can be divided into interventions related to livelihoods, shelter and education. The suggestions below are not exhaustive and are not based on feasibility studies, but are offered by the field teams as ideas for further discussion and exploration.

**Shelter** – Households that experienced damage or loss of their homes and belongings seek assistance in this sector. While recognising the huge amount of assistance that has been received, they are by no means back to their previous living standards. Many households are living in temporary shelters. The analysis in this report suggests that reconstruction costs (even for semi-permanent homes) are unaffordable to almost all households in the three livelihood zones.

**Livelihoods** – The resumption of previous livelihood activities is a priority now that temporary shelters are available and levels of trauma are somewhat reduced.

Fishermen in the Donggala Coastal Fishing Livelihood Zone seek capital or in kind assistance to restart their previous activities. Priorities include boats, engines, fishing equipment (nets, lines, traps, cool boxes, buckets, drying equipment), and repairs. Key informants indicated that there is no interest in sharing of assets (based on previous poor experiences with this) and there are some signs that targeted assistance is causing resentment between and within villages. It will be important to identify fishermen who lost boats and other equipment in a fair and transparent way, perhaps through previous licensing information. Carpentry skills training and tools provision may assist with both construction and boat building/repair needs. Home industries (such as the fish cracker production) to add value to income from fishing should be considered.

Farmers in the Palu Inland Irrigated Agriculture Livelihood Zone urgently request assistance to restore irrigation or to find smaller-scale temporary solutions while the Gumbasa dam irrigation system is being repaired. Assistance with capital and inputs for crops that do not require irrigation would also be useful. Where fields have been disturbed and are now uneven, assistance with flattening them was requested. Capacity building and technical know-
how to improve crop production was also mentioned, in addition to the reactivation or strengthening of farmer groups.

Farmers in the Sigi Upland Agriculture Livelihood Zone seek capital to restart their previous crop production / maintenance activities and improve on those activities (recognising that cacao production has been in decline in recent years). Priorities include continued repairs to irrigation systems for rice production, repairs to the small roads that farmers use to access their fields by motorcycle (which is important for moving inputs and crops), and capital to purchase inputs for production (including fertilizer and labour). Capacity building in cacao production/maintenance was also mentioned, in addition to the provision of quality cacao seeds and the reactivation or strengthening of farmer groups.

Capital to resume and increase livestock production and self-employment activities (petty trade, prepared food sales, small businesses) is also important across all livelihood zones. Access to low interest loans was mentioned as a priority and savings groups may be a longer-term solution for this.

**Humanitarian assistance** – Although most organisations have completed their short-term humanitarian assistance activities, this analysis suggests that some very poor and poor households face a livelihoods protection deficits in the coming year. In the Donggala Fishing Livelihood Zone, very poor and poor households face deficits of of approximately IDR 3,300,000 and IDR 1,000,000 respectively. In the Sigi Upland Agriculture Livelihood Zone, very poor households face a livelihoods protection deficit of approximately IDR 3,600,000 (or roughly two rounds of MPG) in the coming year. These levels of deficit do not take into account longer-term shelter or boat requirements and are dependent on the assumption made here of increased construction labour opportunities. This should be monitored in the coming months.

**Education** – Education for children is a priority for households. Many schools are operating in temporary shelters because of earthquake damage to school buildings. Households also worry about their ability to afford school fees and other education-related costs in future.
Rapid HEA Assessment Report
Kulawi Sub-District, Sigi District
Central Sulawesi, Indonesia

Sigi Upland Agriculture Livelihood Zone

15 April 2019

Zone description

This rapid HEA assessment was conducted in five earthquake-affected villages near Bolapapu in Kulawi Sub-district of Sigi District in Central Sulawesi. Although a formal livelihood zoning has not been carried out, the field team proposes that these villages fall into the Sigi Upland Agriculture Livelihood Zone and are an estimated 200-800 metres above sea level. The topography is mostly hilly where wild and cultivated trees dominate the landscape, interspersed with lowland valley areas where rice production is possible. The area borders Lore Lindu National Park. Natural resources include wild honey, wild boar, rattan, palm wine, pine sap, wood, rattan, sand and stone.

This livelihood zone is located in upland areas of Sigi District where cash crops dominate and most households own land. Unlike in lowland areas in Sigi and Palu Districts, sharecropping and land rental are not common. The main livelihood activity is upland farming of cacao and durian, supplemented by lowland paddy farming by some households. This used to be a coffee-dominant area, but in recent decades cacao is the main crop. Farmers suggest that cacao is now in decline (due to the age of trees, sub-optimal maintenance and disease) and have been planting durian recently. Tree crops take years to mature and most farmers have not started harvesting durian in large quantities yet, but this should increase in future. Some households grow paddy in lowland areas where irrigation systems channel mountain water sources, mostly for own consumption. Few livestock are kept, but some households in Christian communities rear pigs. Goats and cattle are present in some communities in small numbers. Some of these were provided by the government and are owned through farmer groups rather than by individual households.

Casual labour is an important income source for poorer households (both on- and off-farm), along with self-employment. Better off households are salaried or have larger businesses. The main casual labour activities are in agriculture and construction. Self-employment activities include petty trade, kiosks, prepared food sales, ojek, brewing and sand and stone sales. Pine sap tapping is very important in one of the villages visited (Tangkulowi).

The livelihood zone is distant from the main market for cacao and durian in Palu town and frequent landslides occur on the main road, creating temporary problems for market access. Bolapapu is the main town within the livelihood zone.

Both men and women are engaged in most crop production activities (land preparation, planting, weeding and harvesting), whether they are for own production or paid casual agricultural labour. Boys and girls help with all crop production activities related to own production. Paid construction labour, ojek driving and collecting palm wine are activities for men, while selling prepared food is an activity for women. Both men and women can be involved in petty trade and labour migration. In terms of domestic household activities, women generally cook and clean, while men and boys collect firewood and are responsible for any building work. Anyone can collect water for domestic use, where

---

1 Field work for the current profile was undertaken in March-April 2019. The reference year information presented refers to the period April 2017 to March 2018. The current year scenario is for April 2019 to March 2020.

2 The villages visited were Salua, Bolodangko, Tangkulowi, Sungku, Namo. The 2017 population of the entire Kulawi sub-district was 15,462 people.
piped water is not available.

Most households had access to piped water from mountain sources before the earthquake, for which they paid a small monthly contribution. Most homes also had their own toilets. Garbage was generally collected and burned. Health care was provided through village-level clinics that provided care free of charge (for some households) and at a small cost (for others). Most households were connected to mains electricity; some directly and others indirectly (through other houses). Education was available through primary level in all villages and through secondary level nearby. There is a branch of BRI bank in Bolapapu, but bank loans were generally restricted to better off households. Other sources of credit included cooperatives and moneylenders, at higher interest rates. There were few NGOs operating in the area prior to the earthquake.

**Markets**

This livelihood zone is considered remote compared to the other two zones covered in this report, due to its distance from the main market for cacao and durian in Palu town. However, the villages visited are less remote than some of the other villages in Kulawi Sub-District, some of which are only accessible by motorcycle.

The main road from Palu is mostly tarmac, but is vulnerable to landslides and can get cut off in places after earthquakes and during the rainy season. The roads between villages and Bolapapu are mostly tarmac and accessible year-round, but some of the smaller roads require driving through river beds and can be inaccessible after rainfall. Smaller, narrow paths within villages and to farming areas are cement and accessible by motorcycle.

The main mode of transport is motorcycle, with most households owning at least one (sometimes purchased on credit). Motorcycles are used to transport children to school and to transport farmers, inputs and production to and from fields. There are some public transport taxis to Palu.

Only Salua has a weekly market (on Saturdays); the other villages do not and rely on mobile traders from lowland areas to purchase fresh goods (fish, tofu, tempe, vegetables). There are kiosks at village level and some larger shops in Bolapapu.

Cacao and other crops are purchased by local traders/collectors and then sold on to larger traders from Palu or sold directly to Palu-level traders who travel directly to villages to purchase. Most rice is grown for local consumption. Any sales are made to local mills, from which traders purchase. Rice is also supplied to the area from South Kulawi. Pigs and chickens are reared for local consumption.

**Timeline and reference year**

The baseline information on food, income and expenditure presented in this report refers to the period April 2017 to March 2018, the most recent full consumption year before the earthquake. The consumption year for the Sigi Upland Agriculture Livelihood Zone starts with the main harvest of the main crop (cacao) in ~April. In interviews at community level, key informants were asked to rank the last five years, with ‘1’ indicating a poor year and ‘5’ indicating an excellent year. This is summarised in the table below. The average ranking for the reference year was 3-4 (an average to above average year in terms of production, prices and other livelihoods-related events).

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank 1-5*</th>
<th>Events/hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>3</td>
<td>Only ranked 3 because of assistance — otherwise it is a difficult year following the earthquake.</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>Earthquake on 28 Sept 2-18. The year would have been ranked higher until the earthquake hit.</td>
</tr>
<tr>
<td>2017</td>
<td>3-4</td>
<td>Average to above average production and prices in the year before the earthquake.</td>
</tr>
<tr>
<td>2016</td>
<td>2</td>
<td>Key informants mentioned a couple of events that made this year below average: a ong drought; an eclipse in March 2016 on which a cacao production decrease has been blamed.</td>
</tr>
<tr>
<td>2015</td>
<td>3</td>
<td>Average production. Cacao prices were good because of the USD exchange rate.</td>
</tr>
<tr>
<td>2014</td>
<td>4</td>
<td>An above average year. Tapping pine trees started in Tangkulowi; durian planting started in Sungku and other villages.</td>
</tr>
</tbody>
</table>
*5 = an excellent season for household food security (e.g. due to good rains, good prices, good crop yields, etc)
4 = a good season or above average season for household food security
3 = an average season in terms of household food security
2 = a below average season for household food security
1 = a poor season (e.g. due to drought, flooding, pest attack) for household food security

The timeline below places the reference year in relation to the ‘earthquake year’ (April 2018 to March 2019) and the current year (April 2019 to March 2020). In the sections towards the end of this profile, scenarios are developed and illustrated for these two later years (including a projection for the current year).

Seasonal calendar for the reference year

<table>
<thead>
<tr>
<th>Food source/Income activity</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season</td>
<td>XXX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>XX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Festival season</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Construction labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Staple food prices (high)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Water for humans</td>
<td>floods</td>
<td>floods</td>
<td>low/</td>
<td>floods</td>
<td>floods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cacao</td>
<td>XX</td>
<td>X</td>
<td>X</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>XX</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pig sales</td>
<td></td>
<td></td>
<td></td>
<td>piglets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mature sale</td>
<td>x</td>
</tr>
<tr>
<td>Chicken sales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

Although it can rain at any time, the peak of the rainy season is from October to January. Cacao can be harvested at any time, but production peaks from April to June. There is a second main season of harvesting, usually around December – January. The cultivation seasons for paddy were not consistent across villages, with seemingly no fixed pattern because of the use of irrigation. Cultivating twice per year was common in the villages visited. The durian harvest also spreads across the year, varying by variety. Candlenuts are harvested at any time. Coconuts are harvested 3 or 4 times per year. Agricultural labour opportunities are available throughout the year.

Other things in the calendar above revolve around the two main festivals during the year: Ramadan in Muslim communities and Christmas in Christian communities. Construction work opportunities peak in the months leading up to these holidays and they also represent the months when food prices are highest. Fluctuations in rice prices generally do not correspond with periods of more or less local production. Key informants struggled to identify a distinct ‘lean season’.
Wealth breakdown

<table>
<thead>
<tr>
<th>Wealth Groups Characteristics</th>
<th>HH size (no.</th>
<th>Land area cultivated [ha]</th>
<th>Trees</th>
<th>Off-farm activities</th>
<th>Other assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very poor</td>
<td>3-5 (4)</td>
<td>0.25-0.5</td>
<td>200-300 cacao, 0-2 durian</td>
<td>Casual labour</td>
<td>1 motorcycle, 1 mobile phone</td>
</tr>
<tr>
<td>Poor</td>
<td>3-5 (4)</td>
<td>0.5-1</td>
<td>300-500 cacao, 0-5 durian</td>
<td>Casual labour and/or self-employment</td>
<td>1 motorcycle, 1-2 mobile phones</td>
</tr>
<tr>
<td>Middle</td>
<td>3-5 (4)</td>
<td>1-2</td>
<td>500-1000 cacao, 0-10 durian</td>
<td>Self-employment and/or skilled/casual labour</td>
<td>1 motorcycle, 2 mobile phones</td>
</tr>
<tr>
<td>Better off</td>
<td>4-6 (5)</td>
<td>1.5-2.5</td>
<td>1000-1500 cacao, 10-20 durian</td>
<td>Salary or business</td>
<td>1-2 motorcycles, 2-3 mobile phones</td>
</tr>
</tbody>
</table>

The main determinant of wealth in this livelihood zone is the size of land area cultivated, along with type of off-farm activity. People with salaries (with civil service or other types of jobs) are generally in the better off category and having a constant stream of income cushions them from external shocks such as earthquakes. Very poor and poor households obtain much of their cash income from casual work and/or self-employment. Middle households are also engaged in off-farm income generating activities, although the type of labour they do is sometimes more skilled than in the poorer groups.

Land areas owned are generally larger than land areas cultivated. There are a few landless households in the livelihood zone, but this was not typical for any wealth group. All wealth groups grow cacao. Not all households have access to paddy land, but this was more typical for households in the poor and middle wealth groups.

Livestock are kept in very small numbers and most households own only chickens. Pig fattening is more common in middle households.

Household sizes increased slightly in better off households because they tend to attract dependents from less well-off relatives. Most households own at least one motorcycle and one mobile phone. These are partly inputs for production, with motorcycles used to transport inputs to fields and production from fields and phones used to obtain off-farm income generating activities. Motorcycles are also used to transport children to and from school in some villages.

Sources of food in the reference year

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the period April 2017 to March 2018. April represents the start of the consumption year since it is when the main cacao harvesting season usually begins.

During the reference year, most annual food needs across all wealth groups were covered by a combination of market purchase and own crop production. Only poor and middle households typically produced rice in the reference year. Other crops

In the graph, food access is expressed as a percentage of minimum food requirements, taken as an average food energy intake of 2100 kcals per person per day.
grown and consumed in small quantities included vegetables, cassava, bananas, coconuts and durian. Households without access to their own bananas and coconuts could rely on gifts of these foods from neighbours.

The main purchased staple food, across all wealth groups, was rice. Other food items purchased by all wealth groups were vegetable oil, fresh and dry fish, eggs, tofu, tempe, sugar, noodles, vegetables, and condensed milk. Better off households also purchased chickens. Approximately two-thirds of annual kilocalories were obtained from produced or purchased rice, across all wealth groups.

### Sources of cash income in the reference year

The graph provides a breakdown of total cash income according to income source.

<table>
<thead>
<tr>
<th>Annual income range ('000 IDR)</th>
<th>20,000-26,000</th>
<th>26,000-36,000</th>
<th>36,000-50,000</th>
<th>50,000-70,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.Poor</td>
<td>Salary or business</td>
<td>Self - employment</td>
<td>Labour - casual</td>
<td>Livestock sales</td>
</tr>
<tr>
<td>Poor</td>
<td>Crop sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better-off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Across all wealth groups, households obtained their cash income from a combination of on- and off-farm sources in the reference year April 2017 to March 2018. Most crop sales income came from cacao sales, followed by durian sales. Cash income from other crops was relatively minor. Rice was grown mainly for consumption rather than for sale.

Income from livestock sales was restricted to pig sales by middle households. Pig fattening (rather than pig breeding) was the main activity here, with households typically purchasing piglets in March to fatten for nine months and sell in December. This was an income source in Christian communities only.

Casual labour was the main income source for very poor and poor households. Agricultural labour was paid at about IDR 50,000 per day in the reference year and was the main type of casual labour performed by very poor households. Poor and middle households mainly worked in the construction sector, which was better paid at about IDR 60-100,000 per day. Self-employment was also common for these wealth groups, covering activities like prepared food sales, petty trade, kiosks, motorcycle taxis (ojek), rattan sales, pine tapping and brewing. Unlike in the other two livelihood zones contained in this report, PKH was not a typical income source for any wealth group in the reference year.

Better off households typically also had a large income from employment, a business or from large-scale crop production. Total cash income for better off households was nearly 2.5-3 times greater than that of very poor households.

---

3 The average IDR-USD exchange rate in the reference year was IRD 13400 per USD $1.
4 Program Keluarga Harapan, a social assistance programme providing conditional cash to poor families with children in school.
Expenditure patterns in the reference year

Expenditure on food generally (combining staple and non-staple expenditure) was the most significant expenditure category for households across wealth groups. The proportion of money spent on food decreased with wealth, with the very poor spending almost 50% of income on food, while the middle and better off spent 20-30%. There was no major difference in the prices paid for food across wealth groups.

‘HH items’ includes spending on salt, hygiene items, electricity, LPG, and water contributions. ‘Social services’ includes spending on education and health care.

‘Inputs’ includes agricultural inputs (seeds, tools, labour, fertilizer, transport). This category is proportionately large for middle households because they purchase piglets and some fodder, in addition to inputs for crop production. ‘Other’ includes religious contributions, condiments, cosmetics, savings, etc. The cigarettes category is self-explanatory and starts at IDR 10,000 per day for very poor households.

The clothing and health care expenditure categories were separated into spending on adults and spending on children. Overall, about 50-60% of expenditure on clothing was for children across all wealth groups. For expenditure on health care, about 50-70% was for children, although total expenditure in this category was very small. Most households received health care through the government’s health care programme (BPJS5). In the social services category as a whole, 90-100% of expenditure was on education costs rather than on health costs. Within education expenditure, 60-75% of expenditure was on daily pocket money for children.

Hazards

Earthquakes and landslides are the most common hazards affecting livelihoods in the Sigi Upland Agricultural Livelihood Zone. The last severe earthquake before the September 2018 quake was in 2012. However, minor earthquakes and landslides are relatively common. Flash floods are a periodic hazard, affecting some villages more than others. Key informants also complained of drought, affecting crop production in some years. Crop pests are a chronic hazard, with the disease burden on cacao becoming increasingly problematic in recent years.

Response strategies

Households in this livelihood zone engage in a number of strategies in an attempt to cope with hazards and difficult times. These include:

Switching expenditure – Reducing expenditure on expensive, less essential items in order to purchase food and other essential items is a commonly used coping strategy pursued by all wealth groups.

Expanding casual labour – Households seek additional casual labour opportunities in difficult times, both locally and through migration. However, many people were reluctant to migrate in the initial months after the earthquake and preferred to remain close to home due to fear/trauma.

Switching crops – A strategy to cope with the decline in cacao production is to plant durian as a new cash crop. However, this is a long-term strategy because the trees take about five years to reach maturity and bear fruit.

Key parameters for monitoring

The key parameters listed in the table below are things that make a substantial contribution to household food and income sources in the Sigi Upland Agriculture Livelihood Zone. These things could be monitored to indicate potential

5 Badan Penyelenggara Jaminan Sosial.
losses or gains to local household economies, either through ongoing monitoring systems or through periodic assessments. It is also important to monitor the prices of key items on the expenditure side, including food prices.

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Parameter – Quantity</th>
<th>Key Parameter – Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop production</td>
<td>• Cacao production</td>
<td>• Cacao prices</td>
</tr>
<tr>
<td></td>
<td>• Durian production</td>
<td>• Durian prices</td>
</tr>
<tr>
<td></td>
<td>• Rice production</td>
<td></td>
</tr>
<tr>
<td>Other food and cash income</td>
<td>• Pig production</td>
<td>• Pig prices</td>
</tr>
<tr>
<td></td>
<td>• Agricultural labour availability</td>
<td>• Agricultural labour wage rates</td>
</tr>
<tr>
<td></td>
<td>• Construction labour availability</td>
<td>• Construction labour wage rates</td>
</tr>
<tr>
<td></td>
<td>• Self-employment availability</td>
<td>• Self-employment profit rates</td>
</tr>
</tbody>
</table>

**Earthquake year scenario (April 2018 – March 2019)**

Many houses, schools, clinics, government buildings, roads, piped water and irrigation systems were damaged by the earthquake at the end of September 2018 in the villages visited as part of this assessment. There was no electricity for 2-3 months following the earthquake. Different crops were affected in different ways, but farmers generally neglected their trees and fields – and all income-generating activities – in the subsequent months. This was because they were busy rebuilding shelters and also because of fear and trauma.

A large number of organisations are working in the area since the earthquake (including Yayasan Fondasi Hidup (FH Indonesia), Yayasan Sayangi Tunas Cilik (Save the Children Indonesia), Plan International, ADRA, World Vision, Caritas, CARE, Imunitas, Rebana, Karsa, Tramp, KUN and Dompet Dhuafa). Much work has been done to repair piped water and irrigation systems and to provide temporary solutions for damaged homes, schools and clinics. The government restored electricity and is working to repair the main road to Palu.

The scenario developed for the earthquake year is based on most of the annual cacao harvest having already been collected prior to the earthquake (during the peak harvest period in April to June). Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the earthquake year incorporates the following elements:

**Crop production:**
- Most annual cacao production had occurred prior to the earthquake and the decrease in the earthquake year was estimated at 25%.
- One paddy/rice season (out of two seasons annually) was not cultivated.
- Durian collection was down 10% and candle nut collection down 25%. Other crops were largely unaffected (bananas, coconuts, vegetables).

**Labour/self-employment/other:**
- Agricultural labour reduced by 35-40% (almost nothing in October to December while people were busy rebuilding their homes and a large reduction in January to March).
- Construction labour reduced by 40% (similar to agricultural labour).
- Self-employment reduced by 25% (a large reduction in October to December and some recovery in January to March).
- Larger businesses reduced 20%.
- Pig fattening income was left in the analysis (because piglets were purchased prior to the earthquake).

**Market prices:**
- After a short period of disruption, prices returned to pre-earthquake levels.

**Assistance:**
- This varied quite a lot from village to village.
- On average, approximately 3 months of food assistance across wealth groups and 4 months of hygiene items
were received by households in all wealth groups.

- On average, approximately IDR 3,000,000 was received per very poor and poor household and IDR 2,000,000 per middle household. The amount of cash assistance was provided not based on wealth group status, but based on the type of cash programme. For example, the provision of multipurpose cash assistance was based on the level of damaged buildings. However, because of the vulnerability criteria to select beneficiaries, the very poor and poor wealth groups typically ended up receiving more than other wealth groups because they received different types of cash from multiple NGOs.

Note:
- This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in all four wealth groups. Households experienced a drop in total income, somewhat compensated by the large quantities of assistance provided. They likely remained above the livelihood protection threshold, but the very poor in particular were borderline without assistance.

Earthquake year scenario analysis

Very poor HHs

Middle HHs

Note: The graphs show estimates of total income (food plus cash) for the earthquake year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold.
The scenario above does not take into account the problem of shelter. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. In the graphs below, this cost has been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes. This revised livelihood protection threshold was unaffordable to most wealth groups during the earthquake year. The levels of deficit are extremely large for the poorer wealth groups, suggesting that it will be difficult, if not impossible, for households to rebuild their homes without external support.

**Earthquake year scenario analysis with shelter cost**

Very poor HHs  
Poor HHs

Middle HHs  
Better off HHs

Note: The graphs show estimates of total income (food plus cash) for the earthquake year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold (LPT). Shelter costs have been added to the LPT.
Current year scenario (April 2019 – March 2020)

The scenario developed for the current year (April 2019 to March 2020) is based on most households having returned to their farming work in recent months. Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the current year incorporates the following elements:

Crop production:
- Crop maintenance was neglected in the months after the earthquake and farmers have only recently restarted agricultural activities. The expected decrease in annual cacao production this year compared to the reference year is estimated at 30%.
- For paddy/rice, most irrigation systems are now working again, but some problems remain and capital for inputs is lacking. The expected decrease in the first season is 50% and in the second season is 25% compared to the reference year.
- Other crops seem to be largely back to normal.

Labour/self-employment/other:
- Agricultural labour reduced by 50% compared to the reference year (because of lack of capital).
- Construction labour increased by 25% (because of reconstruction activities).
- Self-employment/salaries/businesses largely back to normal.
- Pig fattening income has been removed from the projection (due to lack of capital to restart).

Market prices:
- There are no major market price changes compared to the reference year.

Assistance:
- Food and cash assistance is not included in this scenario (because most organisations haven’t planned such assistance and in order to project possible need).

Note:
- This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in all four wealth groups. The impact of the earthquake is felt more fully in this annual scenario, particularly in the absence of food/cash assistance. Very poor households in particular look likely to struggle to reach the livelihood protection threshold (the level of deficit illustrated below is approximately IDR 3,600,000). They were heavily dependent on agricultural labour in the reference year. The large decrease for middle households is partly because of the removal of pig fattening income.
Current year scenario analysis

Very poor HHs

Note: The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold.

As in the earthquake year scenario, the current year scenario above does not take into account the problem of shelter. Many households have built temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. In the graphs below, this cost has been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes. This revised livelihood protection threshold remains unaffordable to most wealth groups during the current year. The levels of deficit are extremely large for the poorer wealth groups, indicating that it will be difficult, if not impossible, for households to rebuild their homes without external support.
Current year scenario analysis with shelter cost

Very poor HHs

<table>
<thead>
<tr>
<th>% minimum food needs</th>
<th>Ref. year</th>
<th>Curr. year</th>
<th>Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>200%</td>
<td>250%</td>
<td>300%</td>
</tr>
</tbody>
</table>

Poor HHs

<table>
<thead>
<tr>
<th>% minimum food needs</th>
<th>Ref. year</th>
<th>Curr. year</th>
<th>Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>200%</td>
<td>250%</td>
<td>300%</td>
</tr>
</tbody>
</table>

Middle HHs

<table>
<thead>
<tr>
<th>% minimum food needs</th>
<th>Ref. year</th>
<th>Curr. year</th>
<th>Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>200%</td>
<td>250%</td>
<td>300%</td>
</tr>
</tbody>
</table>

Better off HHs

<table>
<thead>
<tr>
<th>% minimum food needs</th>
<th>Ref. year</th>
<th>Curr. year</th>
<th>Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>200%</td>
<td>250%</td>
<td>300%</td>
</tr>
</tbody>
</table>

Note: The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold (LPT). Shelter costs have been added to the LPT.

Recovery priorities

The main recovery priorities for households living in the earthquake affected areas of the Sigi Upland Agricultural Livelihood Zone are shelter, resumption of livelihood activities, and education.

Shelter – Households that experienced damage or loss of their homes and belongings seek assistance in this sector. While recognising the huge amount of assistance that has been received, they are by no means back to their previous living standards. Many households are living in temporary shelters.
Livelihoods – The resumption of previous livelihood activities is a priority now that temporary shelters are available and levels of trauma are somewhat reduced. Farmers seek capital to restart their previous crop production / maintenance activities and improve on those activities (recognising that cacao production has been in decline in recent years). Priorities include continued repairs to irrigation systems for rice production, repairs to the small roads that farmers use to access their fields by motorcycle (which is important for moving inputs and crops), and capital to purchase inputs for production (including fertilizer and labour). Capacity building in cacao production/maintenance was also mentioned, in addition to the provision of quality cacao seeds and the reactivation or strengthening of farmer groups.

Capital to resume and increase livestock production and self-employment activities (petty trade, prepared food sales, small businesses, etc) is also important. Access to low interest loans was mentioned as a priority and savings groups may be a longer-term solution for this.

Humanitarian assistance – Although most organisations have completed their short-term humanitarian assistance activities, this analysis suggests that very poor households face a livelihoods protection deficit of approximately IDR 3,600,000 (or roughly two rounds of MPG) in the coming year. The absence of a deficit for poor households in the current year analysis above is heavily dependent on the assumption of increased construction labour opportunities and this should be monitored in the coming months.

Education – Education for children is a priority for households in the livelihood zone. Many schools are operating in temporary shelters provided by NGOs because of earthquake damage to school buildings. Households also worry about their ability to afford school fees and other education-related costs in future.
This rapid HEA assessment was conducted in five earthquake and tsunami affected villages in Donggala District in Central Sulawesi. Although a formal livelihood zoning has not been carried out, the field team proposes that these villages fall into the Donggala Coastal Fishing Livelihood Zone.

This livelihood zone is located in coastal areas of Donggala District where fishing is the dominant income-generating activity. Wealth is determined by the type of boats and engines and other fishing equipment owned. The ‘better off’ (owners of large boats) are a small percentage of the population and were not met by the team (so results for this group are not presented here).

Most boats are small, so fishing is generally carried out within about two hours / two miles of the coast. Not all households own their own boat, but they typically ‘share’ with households that do own (receiving a share of the catch, under different arrangements). Apart from boats and engines, the fishing equipment used includes fishing lines, nets, trawl nets, traps, buckets, cool boxes, fish drying racks. The types of fish caught include batu (grouper), cakalang (tuna), katombo (Indian mackerel), lajang (mackerel), layar (sailfish), pelagis / teri (sardines), cumi-cumi (squid), and kakap merah (red snapper).

Some households own land, but crop production was not common in the reference year. Clove trees have been planted in recent years in upland areas and some households will start harvesting this crop in future when the trees mature. Coconuts and sago trees are widely available. Few livestock are kept, apart from chickens. The main casual labour activities are in fishing, agriculture and construction.

Access to markets varies considerably in the villages that were visited, with some close to the main road from Palu to Toli Toli and others quite distant.

Own fishing is done exclusively by men and boys, while paid fishing labour is done by men. Fish selling is carried out by both women and men. Women are involved in fish processing and drying. Boat repairs are done by men and boys, while women also assist with net repairs. Paid agricultural and construction labour is done by men, whether local or migrant. Petty trade and selling prepared food are activities for women and girls. In terms of domestic household activities, women generally cook and clean, while men and boys collect firewood and are responsible for any building work. Anyone can collect water for domestic use, where piped water is not available.

Before the earthquake, households obtained water from boreholes, PDAM (public water pipes), fountains and shallow wells. Water was boiled before drinking. There was a small weekly contribution for access to water in some communities. Access to toilets varied considerably from village to village: in some villages, all houses had their own toilets; in other villages, everyone defecated outside. In most villages, garbage was burned. Health care was provided

---

1 Field work for the current profile was undertaken in March-April 2019. The reference year information presented refers to the period March 2017 to February 2018. The current year scenario is for March 2019 to February 2020.
2 The villages visited were Tompe and Tanjung Padang (in Sirenja Sub-District); Labean (in Balaesang Sub-District); Walandano and Manimbaya (in Balaesang Tanjung Sub-District). Where any village also had a farming community, the team focussed on the fishing sub-villages.
through village-level clinics that provided care free of charge (for some households) and at a small cost (for others). There was a child health care unit in each village. Except in Manimbaya, households were connected to mains electricity; some directly and others indirectly (through other houses). In Manimbaya, some HHs used generators and others used solar lamps. Education was available through primary level in all villages and through secondary level nearby. Sources of credit included banks, cooperatives and moneylenders. There were no NGOs operating in the area prior to the earthquake, but the Government Fisheries Department provided assistance with fishing equipment.

Markets

Part of this livelihood zone is located on the main tarmac road north from Palu, where market access is good, while other parts are more inaccessible. The road to Balaesang Tanjung Sub-District is partly dirt and subject to landslides during heavy rains in November – December.

The main modes of transport are by boat and motorcycle, with most households owning at least one motorcycle (sometimes purchased on credit). Motorcycles are used to transport children to school and to transport fishermen to and from markets.

For fish sales, there is a large daily fish market in Labean. Fish are transported from Labean to Palu market by road. Sales also occur from fishermen to traders directly to Palu. Fishermen from Manimbaya and Walandono transport fish to Labean by boat if the weather permits; otherwise by motorcycle; or sell to traders that purchase at village level. Fisherman from Tompe and Tanjung Padang transport fish by motorcycle to Labean or sell to traders who purchase at village level. There are some local sales directly to consumers in neighbouring farming and non-fishing communities. Large boats/traders from Borneo used to come to Labean to purchase fish before the earthquake, but they have not yet returned.

There are no large markets for daily consumption / purchases, but there are weekly markets, and for daily fresh purchases (of vegetables, tofu/tempe, spices, eggs), households rely on daily mobile vendors (motorcycles and pickups).

Timeline and reference year

The baseline information on food, income and expenditure presented in this report refers to the period March 2017 to February 2018, the most recent full consumption year before the earthquake. The consumption year for the Donggala Coastal Fishing Livelihood Zone starts with the main period of fishing in ~March. In interviews at community level, key informants were asked to rank the last five years, with ‘1’ indicating a poor year and ‘5’ indicating an excellent year. This is summarised in the table below. The average ranking for the reference year was 4 (an above average year in terms of production, prices and other livelihoods-related events).

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank 1-5</th>
<th>Events/hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>2</td>
<td>Post earthquake / tsunami there is a lack of fishing boats and equipment. Households are engaged in casual labour and relying on humanitarian assistance.</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>Prior to the earthquake / tsunami year, this year was similar to 2014-17, but the impact of the earthquake / tsunami turned it into a ‘1’.</td>
</tr>
<tr>
<td>2017-2014</td>
<td>4</td>
<td>Not much detail on the years before the earthquake/tsunami, except that they are now considered to be ‘above average’.</td>
</tr>
</tbody>
</table>

*5 = an excellent season for household food security (e.g. due to good fishing, good prices, etc); 4 = a good season or above average season for household food security; 3 = an average season in terms of household food security; 2 = a below average season for household food security; 1 = a poor season for household food security

The timeline below places the reference year in relation to the ‘earthquake year’ (March 2018 to February 2019) and the current year (March 2019 to February 2020). In the sections towards the end of this profile, scenarios are developed and illustrated for these two later years (including a projection for the current year).
Seasonal calendar for the reference year

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry season</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big waves / strong wind / tide water</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing season</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramadan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Construction labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Labour migration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken sales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>High food prices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health - malaria - affects mainly children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paddy season - neighbouring sub-villages</td>
<td>F/W</td>
<td>F/W</td>
<td>H</td>
<td>L</td>
<td>P</td>
<td>F/W</td>
<td>F/W</td>
<td>H</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coconut - harvest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural labour - coconut, cloves</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although it can rain at any time, the peak of the rainy season is from October to February. Fish can be caught at any time, but the fishing season generally runs from January to October, with catches peaking from March/April to June. November and December are low periods for fishing because of the weather (rain and wind and waves).

Agricultural labour availability in neighbouring sub-villages and villages relates to the peak activities for paddy, coconuts and cloves.

Other things in the calendar above revolve around the two main festivals during the year: Ramadan in Muslim communities and Christmas in Christian communities. Construction work opportunities peak in the months leading up to these holidays and they also represent the months when food prices are highest. Key informants struggled to identify a distinct ‘lean season’.

Wealth breakdown in the reference year

Wealth is determined by the type of boats and engines and other fishing equipment owned. Households that did not own a boat, shared boats with others or worked as fishing labourers (earning a share of the catch). Half of very poor households owned a small, wooden boat without an engine. Poor and middle households owned boats with engines of varying sizes. Better off households owned larger boats with 2-3 engines. The ‘better off’ were a small percentage of the population and were not met by the team (so results for this group are not presented here). In some villages, this group was not present, so in effect the middle wealth group can represent the better off in this livelihood zone.

Some households own land, especially in the poor and middle wealth groups, but crop production was not common in the reference year. Clove trees have been planted in recent years, but have not yet reached maturity. This will be an income source in future. Livestock are kept in very small numbers and most households own only chickens.
Most households own at least one motorcycle and one mobile phone. These are partly inputs for production, with motorcycles used to transport fishing equipment and catches and phones used to obtain off-farm income generating activities. Motorcycles are also used to transport children to and from school in some villages.

**Sources of food in the reference year**

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the period March 2017 to February 2018. March represents the start of the consumption year since it is when the main fishing season usually begins.

Households obtained most of their food from market purchase. Consumption of fish from own catch was approximately 1kg per household per day. Rice from the government’s Bulog programme was a small food source. Small quantities of meat are distributed by mosques during festivals. Households without access to their own coconuts could rely on gifts from neighbours or freely available coconuts.

The main purchased staple food, across all wealth groups, was rice. Other food items purchased by all three wealth groups were vegetable oil, eggs, tofu, tempe, sugar, noodles, vegetables, cassava, sago flour, dry fish, chicken, bananas and condensed milk. Approximately 60% of annual kilocalories were obtained from purchased rice, across all three wealth groups.

**Sources of cash income in the reference year**

Households obtained their cash income from fishing, non-fishing labour (in some cases mixed with self-employment), chickens sales and cash transfers (PKH) in the period March 2017 - February 2018.

Households that owned boats with engines could catch more fish and larger fish, which command higher prices per kilo. The fishing part of the graph includes fishing labour, since the main form of payment for this activity was in fish (a share of the catch, subsequently sold).

The casual labour category includes agricultural labour for neighbouring farming communities and construction labour. Middle households had access to higher-paid types of labour, including more skilled work and migration.

---

3 The average IDR-USD exchange rate in the reference year was IRD 13400 per USD $1.
The (less common) self-employment activities in the zone included trading and prepared food sales. Total cash income for middle households was approximately double that of very poor households.

**Expenditure patterns in the reference year**

Expenditure on food generally (combining staple and non-staple foods) was the most significant expenditure category for households across the three wealth groups. The proportion of money spent on food decreased with wealth, with very poor households spending over 40% of income on food, while middle households under 30%. There was no major difference in the prices paid for food across wealth groups.

‘HH items’ includes spending on salt, hygiene items, electricity, LPG, and water contributions. ‘Social services’ includes spending on education and health care. ‘Inputs’ includes fishing inputs (boat and net repairs, other fishing equipment, batteries, transport, fuel). ‘Other’ includes religious contributions, condiments, cosmetics, savings, etc. The cigarettes category is self-explanatory and starts at IDR 10-15,000 per day for very poor households.

The clothing and health care expenditure categories were separated into spending on adults and spending on children. Overall, about 50-60% of expenditure on clothing was for children across all wealth groups. For expenditure on health care, about 50-70% was for children, although total expenditure in this category was very small. Most households received health care through the government’s health care programme (BPJS⁴). In the social services category as a whole, 90-100% of expenditure was on education costs rather than on health costs. Within education expenditure, 60-75% of expenditure was on daily pocket money for children.

**Hazards**

Earthquakes with tsunamis are not very common in the Donggala Coastal Fishing Livelihood Zone – three previous experiences were mentioned to the team in the last 100 years – but they are devastating when they occur. A more regular hazard for fishermen is seasonal: the large waves, strong winds and high tides that occur in November-December each year.

**Response strategies**

Households in this livelihood zone engage in several strategies in an attempt to cope with hazards and difficult times. These include:

Switching expenditure – Reducing expenditure on expensive, less essential items in order to purchase food and other essential items is a commonly used coping strategy pursued by all wealth groups. For example, households increase their purchase of sago flour in bad years, which is less expensive than rice.

Sharing boats – This is a normal strategy for very poor households that do not own boats and has become more widely practised after the earthquake/tsunami.

Expanding casual labour – Households seek additional casual labour opportunities in difficult times, both locally and through migration. However, many people were reluctant to migrate in the initial months after the earthquake – partly because of the requirement to rebuild their homes – and a preference to remain close to home due to fear/trauma.

---

⁴ Badan Penyelenggara Jaminan Sosial.
Key parameters for monitoring

The key parameters listed in the table below are things that make a substantial contribution to household food and income sources in the Donggala Coastal Fishing Livelihood Zone. These things could be monitored to indicate potential losses or gains to local household economies, either through ongoing monitoring systems or through periodic assessments. It is also important to monitor the prices of key items on the expenditure side, including food prices.

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Parameter – Quantity</th>
<th>Key Parameter – Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing</td>
<td>• Size of catches</td>
<td>• Fish prices</td>
</tr>
<tr>
<td>Other food and cash</td>
<td>• Chickens sold</td>
<td>• Chicken prices</td>
</tr>
<tr>
<td>income</td>
<td>• Agricultural labour availability</td>
<td>• Agricultural labour wage rates</td>
</tr>
<tr>
<td></td>
<td>• Construction labour availability</td>
<td>• Construction labour wage rates</td>
</tr>
<tr>
<td></td>
<td>• PKH availability</td>
<td>• PKH payment rates</td>
</tr>
</tbody>
</table>

Earthquake year scenario (March 2018 – February 2019)

Many houses, schools, clinics, government buildings, roads, and water systems were damaged by the earthquake and tsunami at the end of September 2018 in the villages visited as part of this assessment. Fishing boats and equipment were swept away or damaged. Fishermen generally neglected all income-generating activities in the months immediately after the earthquake/tsunami because they were busy rebuilding shelters and also because of fear and trauma. There was little market for their fish in any case immediately after the tsunami because households initially did not want to consume fish from tsunami-affected waters.

Many organisations and government departments have been working in the area since the earthquake (including Save the Children, JMK-Oxfam, Kopernik, Red Cross, MDS, UNDP, PUPR, BPBD and ACT). Much work has been done to provide temporary solutions for damaged homes, schools, clinics, water supplies and public toilets. The government restored electricity and temporary shelters are connected. Households in villages without electricity have been supplied with solar and battery lamps. Some fishing equipment has been supplied, but replacement boats have not yet been provided.

The scenario developed for the earthquake year is based on most of the annual fishing having already occurred prior to the earthquake (during the peak fishing period in April to June). Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the earthquake year incorporates the following elements:

**Fishing:**
- Most of the annual fishing had occurred prior to the earthquake and the decrease in the earthquake year was estimated at 15%.

**Labour/self-employment/other**
- Agricultural labour reduced by 20% (since most occurred in the period prior to the earthquake).
- Construction labour reduced by 50%.

**Market prices:**
- After a short period of disruption, prices returned to pre-earthquake levels.

**Assistance:**
- Approximately 2 months of food assistance across wealth groups and 3 months of hygiene items.
- Approximately IDR 2m per very poor and poor household and IDR 1m per middle household. The amount of cash assistance was provided not based on wealth group status, but based on the type of cash programme. For example, the provision of multipurpose cash assistance was based on the level of damaged buildings. However, because of the vulnerability criteria to select beneficiaries, the very poor and poor wealth groups
ended up receiving more than other wealth groups because they typically received different types of cash from multiple NGOs.

**Note:**
- This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in three wealth groups. Households experienced a drop in total income, somewhat compensated by the large quantities of assistance provided. They likely remained above the livelihood protection threshold, but the very poor in particular were borderline without assistance.

The scenario above does not take into account the problem of shelter or loss of boats experienced in this livelihood zone. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. Boat and engine costs have been estimated at $350-550 per household, depending on wealth group. In the graphs below, these costs have been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes and boats/engines. This revised livelihood protection threshold was unaffordable to most wealth groups during the earthquake year. The levels of deficit are extremely large for all three wealth groups, suggesting that it will be difficult, if not impossible, for households to rebuild their homes and purchase boats / engines without external support.
The scenario developed for the current year (March 2019 to February 2020) is based on most households having returned to fishing in recent months, sharing boats where possible. Any element of this analysis and any assumption made can be revised and updated based on better information. The analysis for the current year incorporates the following elements:

**Fishing:**
- Boat losses approach 70% in the more affected fishing villages, but they are being shared and more frequently used. Peak fishing areas have moved since the tsunami. The estimated fishing income decrease this year is 55%. Note that the less affected villages (Walandano and Manimbaya in Balaesang Tanjung Sub-District) will have a less severe loss of fishing.

**Labour/self-employment/other:**
- Agricultural labour returns to normal (or could increase because cloves trees in the area are maturing).
- Construction labour increased by 25% (because of reconstruction activities).

**Market prices:**
- There are no major market price changes compared to the reference year.

**Assistance:**
- Food and cash assistance is not included in this scenario (because most organisations have not planned such assistance and in order to project possible need).

**Note:**
- This scenario can be revised and other assumptions can be modelled on request.
Given this scenario, the following figures present the results for households in three wealth groups. The impact of the earthquake is felt more fully in this annual scenario, particularly in the absence of food/cash assistance. Very poor and poor households in particular look likely to struggle to reach the livelihood protection threshold (the levels of deficit illustrated below are approximately IDR 3,300,000 and IDR 1,000,000 respectively). Middle households are also likely to see a large decrease in total income.

As in the earthquake year scenario, the current year scenario above does not take into account the loss of shelters / boats / engines. Many households have built temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. Boat and engine costs have been estimated at $350-$550 per household, depending on wealth group. In the graphs below, these costs have been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes, boats and engines. This revised livelihood protection threshold remains unaffordable to most wealth groups during the current year. The levels of deficit are extremely large for the three wealth groups, indicating that it will be difficult, if not impossible, for households to rebuild their homes or purchase boats/engines without external support.
Current year scenario analysis with shelter + boat/engine costs

Very poor HHs  Poor HHs  Middle HHs

Note: The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold (LPT). The ‘food aid/safety nets’ portion represents food and cash transfers. Shelter / boat / engine costs have been added to the LPT.

Recovery priorities

The main recovery priorities for households living in the earthquake affected areas of the Donggala Coastal Fishing Livelihood Zone are shelter, resumption of livelihoods activities, and education.

Shelter – Households that experienced damage or loss of their homes and belongings seek assistance in this sector. While recognising the huge amount of assistance that has been received, they are by no means back to their previous living standards. Many households are living in temporary shelters.

Livelihoods – The resumption of previous livelihood activities is a priority now that temporary shelters are available and levels of trauma are somewhat reduced. Fishermen seek capital or in kind assistance to restart their previous activities. Priorities include boats, engines, fishing equipment (nets, lines, traps, cool boxes, buckets, drying equipment), and repairs. Key informants indicated that there is no interest in sharing of assets (based on previous poor experiences with this) and there are some signs that targeted assistance is causing resentment between and within villages. It will be important to identify fishermen who lost boats and other equipment in a fair and transparent way, perhaps through previous licensing information. Carpentry skills training and tools provision may assist with both construction and boat building / repair needs. Home industries (such as the fish cracker production) to add value to income from fishing should be considered.

Humanitarian assistance – Although most organisations have completed their short-term humanitarian assistance activities, this analysis suggests that very poor and poor households face a livelihoods protection deficit of approximately IDR 3,300,000 and IDR 1,000,000 in the coming year. These levels of deficit do not take into account longer-term shelter requirements and are dependent on the assumption made here of increased construction labour opportunities in the current year, which should be monitored in the coming months.

Education – Education for children is a priority for households in the livelihood zone. Many schools are operating in temporary shelters because of earthquake damage to school buildings. Households also worry about their ability to afford school fees and other education-related costs in future.
This rapid HEA assessment was conducted in five earthquake-affected villages in Donggala and Sigi Districts in Central Sulawesi. Although a formal livelihood zoning has not been carried out, the field team proposes that these villages fall into the Palu Inland Irrigated Agriculture Livelihood Zone. The topography is flat and undulating plains, dominated by farmland, and the zone is surrounded by hills. It is possible that this zone will need to be split in future into areas with different types of irrigation.

This livelihood zone is located in inland, lowland areas of Donggala and Sigi Districts where irrigated agriculture dominates and there are multiple seasons of rice, corn and vegetable production (including tomatoes, chilli, green beans, cucumbers, sweet corn and onions). Land ownership is not widespread amongst the households living in these villages, with many large absentee landlords, which means that sharecropping and land rental are common (under a variety of arrangements). Land areas cultivated increase with wealth, except for very poor households, which do not engage in own agricultural production and are landless labourers.

More livestock are kept in this livelihood zone than in the other two zones covered in this report. Households rear small numbers of cattle, goats and chickens. Cattle and goats are fed on crop residues and free grazing and are not milked.

Casual labour is an important income source for poorer households (both on- and off-farm), along with self-employment activities. Some better off households are salaried or have larger businesses or large-scale farming. The main casual labour activities are in agriculture and construction. Self-employment activities include petty trade, kiosks, prepared food sales, and motorcycle taxis (ojek).

Most farmers sell their crops and livestock directly to traders at village level. Market access is generally good in this livelihood zone, due to good roads and close proximity to Palu town.

Except for land preparation, which is an activity usually carried out by men (using tractors or hand tractors), both men and women are active in most other crop production activities (planting, weeding, harvesting, threshing), whether they are for own production or paid casual agricultural labour. Boys help with all crop production activities related to own production. Crop sales are carried out by both men and women. Paid construction labour and ojek driving are activities for men, while selling prepared food is an activity for women and girls. Boys sometimes assist their fathers in unskilled construction labour. Both men and women can be involved in petty trade and labour migration. In terms of domestic

---

1 Field work for the current profile was undertaken in September 2019. The reference year information presented refers to the period October 2017 to September 2018 (i.e. the one year period immediately before the earthquake). The current year scenario is for October 2018 to September 2019.

2 The villages visited were Labuan, Lero Tatari, Lolu, Pombewe, Sibalaya. Where any village also had a fishing community, the team focussed on the farming sub-villages. The villages are indicated with green stars in the maps above.
household activities, women generally cook and clean, while men and boys collect firewood and are responsible for any building work. Anyone can collect water for domestic use, where piped water is not available.

Most households had access to water from boreholes, wells or piped water systems before the earthquake. Most homes also had their own toilets. Garbage was generally burned. Health care was provided through village-level clinics that provided care free of charge (for some households) and at a small cost (for others). The vast majority of households were connected to mains electricity; some directly and others indirectly (through other houses). Education was available through secondary level in all the visited villages. Sources of credit included banks, cooperatives, moneylenders, pay advances from employers, and items taken on credit from kiosks. There were a few NGOs operating in the area prior to the earthquake, including World Vision and Bina Desa.

**Markets**

Market access is generally good in this livelihood zone, due to good roads and close proximity to Palu town. Despite proximity to the market, most farmers sell their crops and livestock directly to traders at village level.

The main roads to most villages are tarmac and smaller roads are tarmac or dirt. The main mode of transport is motorcycle, with most households owning at least one (sometimes purchased on credit). Motorcycles are used to transport children to school, labourers to jobs, and farmers, inputs and production to and from fields.

Most villages have a weekly market. In between these markets, households rely on mobile traders to purchase fresh goods (fish, tofu, tempe, vegetables). In addition, there are kiosks at village level.

Crops are purchased by traders and then sold on to larger traders in Inpres and Masombo markets. Most rice is grown for local consumption within Central Sulawesi, while corn and vegetables were both consumed locally and exported to other provinces. Some corn (fodder) was sold directly to large-scale chicken farmers. Livestock were generally sold to local markets.

**Timeline and reference year**

The baseline information on food, income and expenditure presented in this report refers to the period October 2017 to September 2018, the most recent full year before the earthquake. The consumption year for the Palu Inland Agriculture LZ was unclear because there are multiple harvest periods through the year and no lean season. The team decided to use the 12-month period immediately before the earthquake as the reference year. In interviews at community level, key informants were asked to rank the last five years, with ‘1’ indicating a poor year and ‘5’ indicating an excellent year. This is summarised in the table below. The average ranking for the reference year was 4 (an above average year in terms of production, prices and other livelihoods-related events).

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank 1-5*</th>
<th>Events/hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>2</td>
<td>Only ranked above 1 because of assistance – otherwise it is a difficult year following the earthquake.</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>Earthquake on 28 Sept 2018. The year would have been ranked higher until the earthquake hit.</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
<td>Above average production and prices in the year before the earthquake.</td>
</tr>
<tr>
<td>2016</td>
<td>3</td>
<td>An average year.</td>
</tr>
<tr>
<td>2015</td>
<td>3-4</td>
<td>An average to above average year.</td>
</tr>
</tbody>
</table>

*5 = an excellent season for household food security (e.g. due to good rains, good prices, good crop yields, etc)
4 = a good season or above average season for household food security
3 = an average season in terms of household food security
2 = a below average season for household food security
1 = a poor season (e.g. due to drought, flooding, pest attack) for household food security

The timeline below places the reference year in relation to the current year (October 2018 to September 2019). In the sections towards the end of this profile, a scenario is developed and illustrated for this year (including a projection).
Although it can rain at any time, the peak of the rainy season is from November to April, according to village-level key informants. Cultivating rice twice per year was common in the villages visited, with harvests in October/November and April/May. Corn was typically harvested two or three times per year. Three seasons of vegetable production were possible in irrigated areas where vegetables were the main crop, or once per year where different crops are grown on the same piece of land in different seasons. Agricultural labour opportunities were available throughout most of the year. Fluctuations in rice prices generally do not correspond with periods of more or less local production. Key informants struggled to identify a distinct ‘lean season’.
is quite limited and in some villages a large proportion of land is owned by people who do not live in the village. Sharecropping and land rental – under various arrangements – are common. Cattle, chickens and goats are the main livestock types kept, all in relatively small numbers. People with salaries (with civil service or other types of jobs) are generally in the better off category. Very poor and poor households obtain much of their cash income from casual work and/or self-employment. Middle households are also engaged in off-farm income generating activities, although the type of labour they do is sometimes more skilled than in the poorer groups. They tend to be land owners (rather than renting or sharecropping land).

Most households own at least one motorcycle and one mobile phone. These are partly inputs for production, with motorcycles used to transport inputs to fields and production from fields and phones used to obtain off-farm income generating activities. Motorcycles are also used to transport children to and from school in some villages.

Sources of food in the reference year

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the period October 2017 to September 2018, the year before the earthquake.

In this period, households obtained most of their food from own crop production and market purchase. Small food sources included payments in kind (meals taken with employers while doing casual work), gifts, assistance (Bulog) and livestock products (chicken and goat meat). Better off households sold rather than consumed much of their crop production.

Households did not consume much of what they produced and purchased most food items, including rice, fish (fresh, dried, canned), vegetable oil, sugar, vegetables, tofu, tempe, noodles, eggs, condensed milk, cassava, sweet potatoes, fruit, coconuts and chicken. Approximately two-thirds of annual kilocalories were obtained from produced or purchased rice, across all wealth groups.

In the graph, food access is expressed as a percentage of minimum food requirements, taken as an average food energy intake of 2100 kcals per person per day.
Sources of cash income in the reference year

The graph provides a breakdown of total cash income according to income source.

<table>
<thead>
<tr>
<th>Annual income range ('000 IDR)</th>
<th>25,000-30,000</th>
<th>35,000-40,000</th>
<th>40,000-55,000</th>
<th>60,000-100,000</th>
</tr>
</thead>
</table>

Crop and livestock sales were more important for middle and better off farmers in this livelihood zone (although it should be noted that there were households in these wealth groups that focussed more on business or formal employment).

Casual labour was the main income source for very poor and poor households. Agricultural labour was paid at about IDR 70,000 per day in the reference year and was the main type of casual labour performed by very poor households. Poor and middle households worked in the construction sector, which was better paid at about IDR 70-110,000 per day. Middle households were more involved in skilled construction labour.

Total cash income for better off households was about three times greater than that for very poor households, but this is somewhat misleading due to the large amount of agricultural inputs that they need to purchase in order to obtain such high levels of crop production (see next section on expenditure). Cash income available for expenditure after paying for inputs is more similar from one wealth group to another and is illustrated to the left. In this case, total cash income for better off households was roughly double that for very poor households.

The average IDR-USD exchange rate in the reference year was IRD 14,000 per USD $1.
Expenditure patterns in the reference year

Expenditure on food generally (combining staple and non-staple expenditure) was the most significant expenditure category for households across wealth groups. The proportion of money spent on food decreased with wealth, with the very poor spending over 40% of income on food, while the better off spent around 20%. There was no major difference in the prices paid for food across wealth groups.

‘HH items’ includes spending on salt, hygiene items, electricity, and LPG. ‘Social services’ includes spending on education and health care. Inputs’ includes agricultural inputs (seeds, tools, labour, fertilizer, transport). ‘Other’ includes religious contributions, condiments, cosmetics, savings, etc. The cigarettes category is self-explanatory and starts at IDR 10-15,000 per day for very poor households.

The clothing and health care expenditure categories were separated into spending on adults and spending on children. Overall, about 50-60% of expenditure on clothing was for children across all wealth groups. For expenditure on health care, about 50-70% was for children, although total expenditure in this category was very small. Most households received health care through the government’s health care programme (BPJS). In the social services category as a whole, 90-100% of expenditure was on education costs rather than on health costs. Within education expenditure, 60-75% of expenditure was on daily pocket money for children.

Hazard

Severe earthquakes are infrequent hazards in the Palu Inland Irrigated Agriculture Livelihood Zone. Key informants complained of drought affecting crop production in approximately one year in five. Crop pests are a chronic hazard.

Response strategies

Households in this livelihood zone engage in several strategies to cope with hazards and difficult times. These include:

Switching expenditure – Reducing expenditure on expensive, less essential items in order to purchase food and other essential items is a commonly used coping strategy pursued by all wealth groups.

Expanding casual labour – Households seek additional casual labour opportunities in difficult times, both locally and through migration. However, many people were reluctant to migrate in the initial months after the earthquake and preferred to remain close to home due to fear/trauma.

Switching crops – When irrigation systems are disrupted, farmers switch from producing rice to producing corn or other crops that can be grown without irrigation.

Borrowing – Casual labourers request payments in advance when facing difficult times or obtain expenditure item on credit from kiosks. There is a limit to which this strategy can be used when households in all wealth groups are facing problems.

Key parameters for monitoring

The key parameters listed in the table below are things that make a substantial contribution to household food and income sources in the Palu Inland Irrigated Agriculture Livelihood Zone. These things could be monitored to indicate potential losses or gains to local household economies, either through ongoing monitoring systems or through periodic assessments. It is also important to monitor the prices of key items on the expenditure side, including food prices.

---

4 Badan Penyelenggara Jaminan Sosial.
Many houses, schools, clinics, government buildings, roads, piped water and irrigation systems were damaged by the earthquake and liquefaction at the end of September 2018 in the villages visited as part of this assessment. Farming has been greatly affected in areas where the irrigation system has been damaged. The villages visited during this assessment fall into two types in terms of irrigation: villages where irrigation has been largely restored (such as Lero Tatari) and villages that are dependent on irrigation from the Gumbasa Dam, where irrigation will not be restored for some years. Even where the irrigation system was not damaged (or was quickly repaired), farmers generally lost a season of production due to the earthquake and subsequent shocks. Farmers generally neglected their farming activities – and all income-generating activities – in the months following the earthquake. This was because they were busy rebuilding shelters and also because of fear and trauma.

Many organisations, government departments and private companies have been providing assistance in the area since the earthquake. Much work has been done to provide temporary solutions for damaged homes, schools, clinics, water supplies and public toilets. The government restored electricity and temporary shelters are connected. Some assistance has already been provided in the agriculture sector in terms of seeds and other inputs for farmers, as well as cash-for-work for agricultural labour (so that farmers can work on their own fields rather than having to work elsewhere for urgently needed daily cash).

The analysis for the current year incorporates the following elements for the ‘more affected’ villages (where irrigation systems have not been restored). Any aspect of this analysis and any assumption made can be revised and updated based on better information. The scenario does not apply to households that have lost their homes and their land and are now living outside the livelihood zone in displaced camps.

**Crop / livestock production:**
- Both paddy/rice seasons are not cultivated in the current year.
- The first corn and vegetable production seasons were not cultivated, with gradual recovery in seasons 2 and 3.
- Livestock production largely unaffected.

**Labour/self-employment:**
- Agricultural labour reduced by 75% (because of the decline in crop production)
- Construction labour increased by 25%. Very poor households switch from agricultural labour to construction labour.
- Better off use savings to engage in self-employment.
- Petty trade increased by 20%.

**Market prices:**
- After a short period of disruption, prices returned to pre-earthquake levels.

**Assistance:**
- Approximately 2 months of food assistance across wealth groups and 3 months of hygiene items.
- Approximately IDR 3m cash for most households from different cash assistance programmes.
Note:
- This scenario can be revised and other assumptions can be modelled on request.

Given this scenario, the following figures present the results for households in all four wealth groups. Households experienced a large drop in total income (combining food and cash), somewhat compensated by the large quantities of assistance provided. All wealth groups fell below the livelihoods protection threshold without assistance. With assistance, they likely remained above the livelihoods protection threshold, but this is dependent on construction labour having expanded. The availability of construction labour in the period through September 2019 (and beyond) should be monitored.

<table>
<thead>
<tr>
<th>Current year scenario analysis (without shelter cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very poor HHs</strong></td>
</tr>
<tr>
<td><img src="graph1.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>Poor HHs</strong></td>
</tr>
<tr>
<td><img src="graph2.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>Middle HHs</strong></td>
</tr>
<tr>
<td><img src="graph3.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>Better off HHs</strong></td>
</tr>
<tr>
<td><img src="graph4.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

| Note: The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold. |

The current year scenario above does not take into account the problem of shelter. Many households have built...
temporary shelters with external assistance, but more permanent shelters have yet to be built or provided. The YSTC shelter team has estimated the cost of building a basic 18 square metre semi-permanent home at USD $1,000. In the graphs below, this cost has been added to the livelihoods protection threshold. The graphs are only relevant for households that lost – or had severe damage to – their homes. This revised livelihood protection threshold remains unaffordable to all wealth groups during the current year. The levels of deficit are extremely large for most households, indicating that it will be difficult, if not impossible, for them to rebuild their homes without external support.

Current year scenario analysis with shelter cost

<table>
<thead>
<tr>
<th>Very poor HHs</th>
<th>Poor HHs</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Middle HHs</th>
<th>Better off HHs</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Graph" /></td>
<td><img src="image4.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

**Note:** The graphs show estimates of total income (food plus cash) for the current year (labelled ‘Curr.year’) and reference year (labelled ‘Ref.year’). These are compared with the intervention thresholds (in the right-hand bar for each wealth group) to indicate whether there is a deficit this year. The pink section of the thresholds bar represents the survival threshold, while the pale blue section represents the livelihoods protection threshold (LPT). Shelter costs have been added to the LPT.
Recovery priorities

The main recovery priorities for households living in the earthquake affected areas of the Palu Inland Irrigated Agriculture Livelihood Zone are shelter, resumption of livelihoods activities, and education.

**Shelter** – Households that experienced damage or loss of their homes and belongings seek assistance in this sector. While recognising the huge amount of assistance that has been received, they are by no means back to their previous living standards. Many households are living in temporary shelters.

**Livelihoods** – The resumption of previous livelihood activities is a priority now that temporary shelters are available and levels of trauma are somewhat reduced. Farmers urgently request assistance to restore irrigation or to find smaller-scale temporary solutions while the Gumbasa dam irrigation system is being repaired. Assistance with capital and inputs for crops that do not require irrigation would also be useful. Where fields have been disturbed and are now uneven, assistance with flattening them was requested. Capacity building and technical know-how to improve crop production was also mentioned, in addition to the reactivation or strengthening of farmer groups.

Capital to resume and increase livestock production and self-employment activities (petty trade, prepared food sales, small businesses) is also important. Access to low interest loans was mentioned as a priority and savings groups may be a longer-term solution for this.

**Education** – Education for children is a priority for households in the livelihood zone. Many schools are operating in temporary shelters because of earthquake damage to school buildings. Households also worry about their ability to afford school fees and other education-related costs in future.
Annex

Notes on HEA-based interviews in Sangurara displaced settlement near Pombewe village in Sigi District. 5-6 April 2019

The Yayasan Fonasi Hidup (FH Indonesia) team conducted HEA-based interviews in one displaced settlement called Sangurara, which is near Pombewe village in Sigi District, on 5-6 April 2019. This did not form part of the main Rapid HEA. The settlement consists of 167 households that were displaced from Jono Oge village, one of the areas that was severely affected by liquefaction following the magnitude 7.4 earthquake that struck Central Sulawesi on 28 September 2018.

Before the earthquake: Approximately 60-70% of households in Jono Oge village were engaged in farming before the earthquake. The farmland around Jono Oge was supplied with irrigated water by the Gumbasa Dam irrigation scheme and the main crops grown were vegetables, rice and coconuts. The area was especially known for vegetable production, which was possible throughout the year because of access to the irrigation system (with a short gap in January when the irrigation system was usually closed for repairs/maintenance). Traders from other districts used to purchase vegetables directly from farmers in the village.

Amongst the households that did not farm were landless construction and agricultural labourers, plus some traders and people with formal-sector employment, including civil servants. Some households kept livestock, including pigs. The population was approximately 60% Christian and 40% Muslim.

Jono Oge village falls into the lowland Inland Irrigated Agriculture Livelihood Zone that was assessed separately as part of the Rapid HEA conducted in three livelihood zones of Central Sulawesi by Yayasan Sayangi Tunas Cilik (Save the Children Indonesia) and Yayasan Fondasi Hidup (FH Indonesia) in March-April 2019.

After the earthquake: Approximately 20% of the households remained in Jono Oge, while the other 80% scattered, with 167 households settling about 3 km away near Pombewe village, in a place they now call Sangurara. The displaced households are scared to return to live in Jono Oge, where their houses and livelihoods were destroyed. The land that was affected by liquefaction can no longer be used for farming and irrigation from the Gumbasa dam scheme will not be restored for some years.

Six months after the earthquake, households in Sangurara continue to live in a state of uncertainty. The government has said it will provide them with permanent homes, but they do not know where or when this will happen. They do not know if they will remain in Sangurara, return to Jono Oge or be requested to move somewhere else. They do not know if they will be provided with assistance or land to resume their former livelihoods.

Households have been provided with temporary shelters in Sangurara with access to electricity. NGOs have provided water supply, sanitation facilities, health care, food and non-food items and cash assistance. The NGOs working in the settlement include FH, Oxfam, YEU, PKBI and SOS. FH provided a multi-purpose cash transfer of IDR 2,400,000 to each household in February 2019. Community leaders stated that most households still had a stock of rice and vegetable oil provided through assistance, but that it was likely to run out in the coming month.

Children from Sangurara are attending school in Jono Oge or other nearby villages. Parents transport them to and from school by motorcycle. Approximately 60% of households still own a motorcycle and those without share transport without paying. According to community leaders, there have been no school dropouts and no distress sales of motorcycles. Some people had purchased motorcycles on loan purchase prior to the earthquake. There was a 6-month forgiveness period on loan repayments after the earthquake, but that was due to end in April 2019. Key informants were unsure how they were going to make these repayments once they restarted.

Households in Sangurara are trying to obtain cash income in any way they can, but options are reported to be limited. Income generating activities include: construction labour in nearby villages and in Palu, charcoal production, small-scale kiosks, agricultural labour in neighbouring villages, prepared food selling, livestock rearing, peeling and chopping shallots. A very small number of households have someone in full-time employment as a civil servant (jobs that were held prior to the earthquake). It was difficult to define wealth groups within the community, so interviews were held with households with two (non-assistance) income sources, households with one income source and households with no income source.

In the group with two income sources, cash income over the period October 2018 to March 2019 (6 months) was about IDR 7,500,000 and included casual labour (in construction and agriculture), prepared food sales, cash-for-work and the FH multi-purpose cash transfer. The average household size in this group was 4 people, with 2 children typically in primary school. The largest expenditure items were approximately IDR 2,600,000 on food (including salt, spices and coffee), IDR 1,000,000 on pocket money, IDR 1,000,000 on motorcycle fuel, and almost IDR 1,600,000 on cigarettes, snacks and phone.

In the group with one income source, cash income over the period October 2018 to March 2019 (6 months) was about IDR 3,100,000 and included a small amount of construction labour in addition to the FH multi-purpose cash transfer. The average household size in this group was 3 people. Households spent approximately IDR 1,600,000 on food, and IDR 900,000 on cigarettes and phone. One child was typically reported to be in primary school, but there was no education-related expenditure.

In the group with ‘no’ income sources, cash income over the period October 2018 to March 2019 (6 months) was about IDR 2,800,000 and included a small amount of petty trade in addition to the FH multi-purpose cash transfer. The average household size in this group was 1 person. Households spent approximately IDR 900,000 on food, IDR 700,000 on investment (in piglets or trading), and saved one-third of their income.

Note that households did not need to purchase rice, vegetable oil, sugar, noodles, tinned fish hygiene items or clothes during the period October 2018 to March 2019 because they received these items as assistance.
The recovery priorities expressed by community leaders and by wealth group interview participants included:

- Government decisions about long-term resettlement, housing and farming
- Irrigation, tools and other inputs to restart farming in Jono Oge, Sangurara or elsewhere
- Capital to restart other previous income-generating activities, including livestock rearing, trading, prepared food selling, other self-employment
- Food, non-food and cash assistance

Some households used the previous cash assistance provided by FH in February 2019 for investment rather than for consumption. They purchased seeds for growing vegetables, livestock, a motorcycle for transport to labour opportunities; started small-scale petty trade or prepared food sales.