

Rapid assessment of 2026 El Niño in PNG: Observations during a fresh produce value chain study

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Introduction and background

The National Agriculture Research Institute (NARI) and the International Food Policy Research Institute (IFPRI) conducted a detailed fresh produce value chain survey along the Highlands Highway from August through September 2026 to investigate challenges and opportunities for growing the fresh vegetable sector in Papua New Guinea (Figure 1 displays survey areas). While preparing for the survey, PNG stakeholders requested that the survey team collect data on evolving conditions due to the severe El Niño predicted for 2026-2027. After a variety of stakeholder consultations, a survey module was designed to allow survey supervisors to provide open-text observations of community conditions related to El Niño based on 6 indicators. The six indicators had accompanying question prompts for supervisors to consider as they observed each theme in the survey communities, respectively (Table 1).

Table 1: El Niño rapid community assessment: themes and guiding questions

Observation Themes	Guiding questions
Local market observations	- Are there enough staple crops being sold in the market? - How does the kaukau (sweet potato) look like that are being sold in the market (size, quality, pest presence)?
Livestock movement	- Are people selling more livestock or meat than usual to earn money to purchase food? - Lots of pigs moving for sale?
Water availability	- Are more women and children carrying buckets or containers to fetch water? - Are the rivers and streams low or drying up? - Are people having to travel further to get water? - How much further are they traveling than usual?
Trade shop stock and prices	- Is there still rice for sale in the trade shops? - Are supplies getting low?

- How much is the price for a 1kg bag of rice now compared to earlier?

School hours and child food consumption

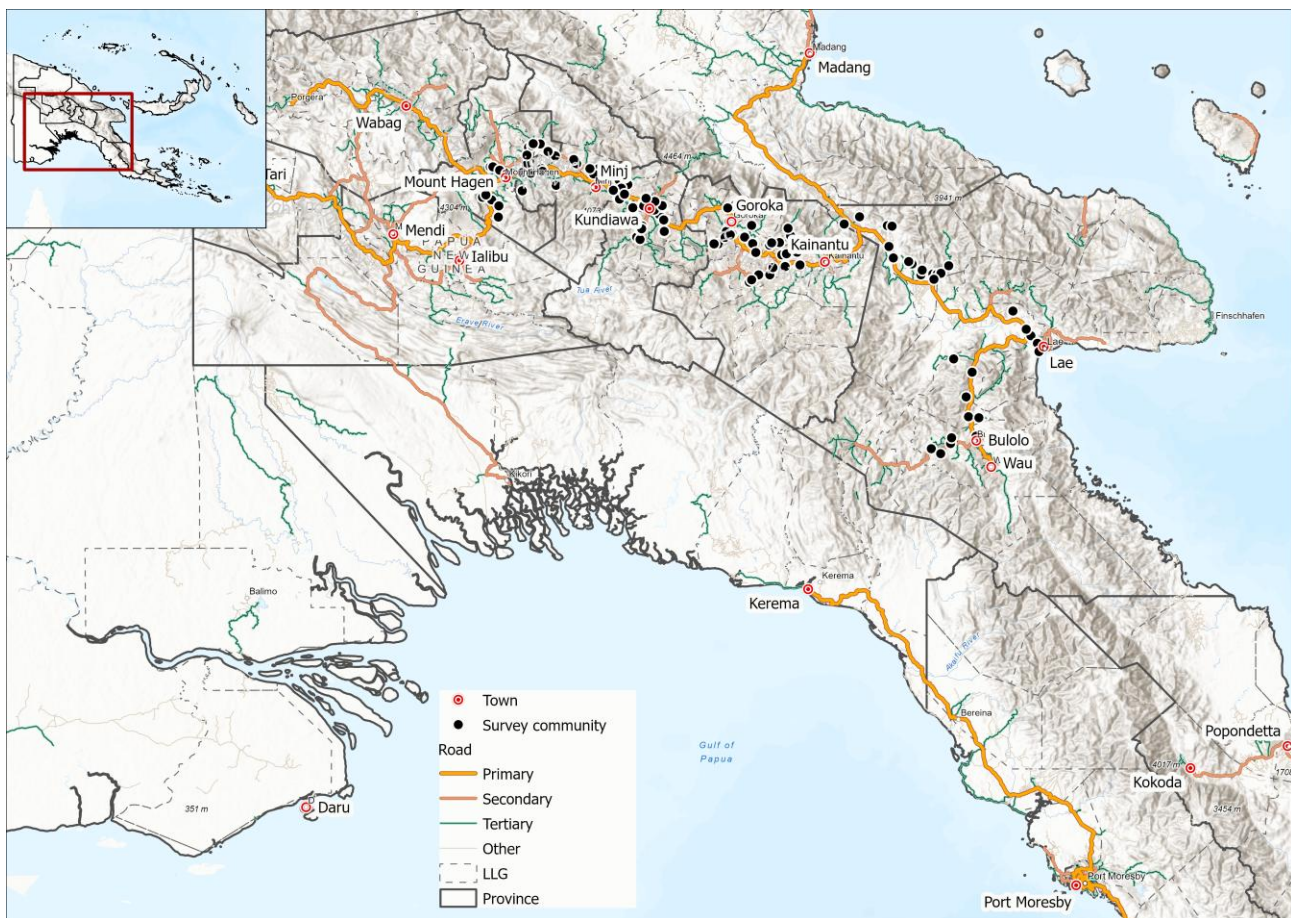
- Are kids going to school without lunch or are lunches smaller than usual?
- Are school hours shortened so kids can go home to eat?

Garden conditions

- What do gardens and the environment look like?
- Is it dry and brown?
- Do you see wilted or ruined plants?

Source: PNG Fresh Produce Value Chain Survey, 2026

Figure 1: Fresh Produce Value Chain Community Survey Areas



Source: Authors' calculations

Survey sample

It is important to note that this analysis is not nationally representative, nor representative at any administrative level. Rather, the rural component of the fresh produce value chain survey was designed to represent areas that focus on the commercial fresh produce value chain. Therefore, the geographic sampling universe is restricted to communities within ≤ 3 hours travel time to the nearest primary road or the Highlands highway. Five provinces were purposefully selected for the survey given their geographic location along the Highlands highway:

- 1) Morobe Province
- 2) Eastern Highlands Province (EHP)
- 3) Chimbu Province
- 4) Western Highlands Province (WHP)
- 5) Jiwaka Province

Within these provinces, 6 LLGs were randomly selected for Morobe, EHP, and Chimbu, while 5 and 3 LLGs were randomly selected for WHP and Jiwaka province, respectively.¹ Within each randomly selected LLG, a total of 5 communities were randomly selected for enumeration. In doing so, communities were divided into 'connected' (less than 1 hour travel time) and 'less connected' (1-3 hours travel time) categories based on travel time to the Highlands Highway or a primary (paved), connector road to the Highlands Highway. From this categorization, 3 'connected' and 2 'less connected' communities were randomly selected for enumeration within each randomly selected LLG. According to recent PNG census figures, about 73% of the total population across the five sample provinces reside within 3 hours of a primary road. Appendix 1 lists the LLGs that were randomly selected for survey enumeration.

Observational analysis methodology and caveats

The observational analysis reported in this research brief constructs a severity ranking score that uses keyword and phrase matching applied to open text observation notes written by the enumeration team that visited each of the survey communities. Overall, 130 communities were visited. Of which, 123 community observations contained open text observations of the current conditions of the community on the day that the enumerator visited and recorded their observations.

The severity index is built using four steps and applied separately to each of the six themes (market, livestock, water, trade shops, schools, and gardens) for each community observation. First, each recorded observation is checked against a theme-specific list of severity and relief phrases using key-word matching analysis in Claude. Severity phrases (wording that signals conditions worsening, such as "dried up" or "wilted") and relief phrases (wording that signals status quo, such as "not affected" or "as normal") were counted within each community observation. In addition, if a specific theme was not mentioned in the community observation field, it was coded as "not mentioned" (Appendix 2 provides the list of keywords and phrases used to calculate the severity score). Second, a raw score is calculated as the count of severity phrase hits minus the count of relief phrase hits within a specific community observation for each respective theme. Third, because raw scores aren't directly comparable across themes, each theme's raw scores are rescaled independently across the full survey sample of observations using a min-max transformation, so the most severe wording found anywhere in a respective theme becomes a 5 and the mildest becomes a 0, with everything else falling proportionally in between. Finally, the overall severity score for an observation is the sum of its six scaled theme scores (0-30 total), treating any theme not mentioned as a 0 for that sum.

It is important to note that observations describing problems across several themes generally rank higher than those describing a single severe issue in isolation. Thus, differences in supervisor reporting and thoroughness can affect the ranking. For example, the enumerator that surveyed the Eastern Highlands Province wrote structured observations that explicitly describe each of the six themes for each community observation, whereas, enumerators in other provinces wrote more informal field notes that describe one or two themes that stood out to them as they visited the community. Since the scoring

¹ LLGs with fewer than five communities ≤ 1 hour or fewer than four communities within 1–3 hours of the Highlands highway were excluded as potential LLG survey candidates.

method counts phrase matches per theme, longer and more thematically complete observations have more opportunities to flag both severity and relief phrases across more themes, which inflates the number of themes marked "mentioned" and pushes overall scores upward for communities in Eastern Highland Provinces relative to other provinces, independent of whether conditions are actually worse in Eastern Highlands Province.

Finally, it should be noted that this analysis is not derived from a validated survey instrument. The severity scores reported in this brief reflect how an observation is *worded*, not a direct measure of food security or hardship. Because the method counts phrases rather than imputing severity directly, it is best read as a transparent way to sort and prioritize observations for follow-up evaluation, and not as a validated severity index.

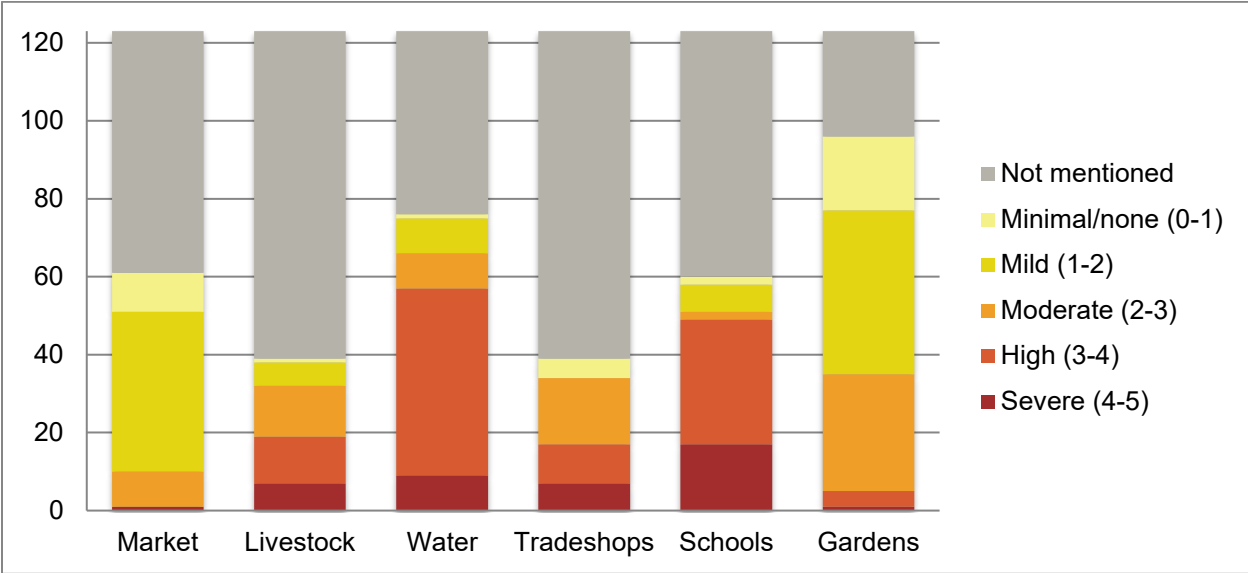
Results

The results are organized in three sections whereby section one provides a broad overview of the full community sample that reported observations (123 communities) describing conditions by theme, while section two investigates the same themes by province. Finally, section 3 provides a summary of each theme and provides examples from community observations of each theme description. It is important to note that 3 provinces (Morobe, EHP and Chimbu) have only 30 community observations (however Chimbu and Eastern Highlands recorded 28 and 29 El Niño community observations), while WHP (25 communities sampled) and Jiwaka (15 communities sampled with 11 surveys that included observation notes) have fewer observations. Thus, this analysis should be read with caution, recognizing that differences across reporting practices and community locations differ substantially and may skew results.

1. Overall assessment

Across the whole dataset (123 observations), results suggest that water availability and school environment / reduced school day was the most significant theme affecting communities during August – September (Figure 2). The greatest number of observations among the 'high' and 'severe' ranking were within the water theme. More than half of the community observations that mention water challenges rank in the top two highest severity rankings. School environment and shortened school days reflect the largest 'severe' impact band (17 observations) of any theme, with an additional 32 observations on school effects that ranked in the 'high' severity band.

Figure 2: Number of observations by theme and severity rank



Source: PNG Fresh Produce Value Chain Survey, 2026. Note: Figure 2 depicts the entire community observation sample of 123 communities along the Highlands Highway across 5 provinces (Western Highlands, Jiwaka, Chimbu, Eastern Highlands, and Morobe).

The dominant pattern across most communities in the sample provinces is a decreased volume of garden food reaching roadside and main markets. Enumerators use words like shortage, few, not much, and production decline to describe greens, sweet potato, cassava, banana, and taro supply. Sweet potato is noted as smaller and lower quality in several enumerator notes. However, the observation ranking of the garden theme during the time of data collection (July – August) suggests relatively mild or moderate impacts. We hypothesize that this is due to several reasons: 1) enumerator notes suggested that while the garden conditions were stressed, villagers reported recent short rainfalls that gave relieve to wilted plants; 2) garden conditions are very location specific, so while one area may have experienced severe impacts another may be less affected; and 3) follow-up stakeholder discussions have highlighted that the primary negative impacts on gardens and markets is later-onset after crops are unable to reach groundwater storage that is hypothesized to be maintaining hardier crops such as cooking banana and cassava. Finally, livestock culling and trade shops stock (i.e., availability of rice and rice prices) seem less affected by the current (August-September) El Niño conditions based on the largest share of observations where these themes were not mentioned (84 observations for both themes of 123 total observations did not mention issues with livestock or trade shop stock.)

A recurring counter narrative across community observations and provinces is that a given community is not severely affected because of altitude, cold climate, or nearness to a mountain stream. These observations are sometimes accompanied with a caution that this could change if the dry spell continues for a longer period. Based on the overall data analysis, this qualifier shows up often enough that it should be read as a real pattern, echoing similar concerns voiced during follow-up stakeholder discussions.

2. Province-level assessment

Given the geographic diversity of PNG's provinces and their associated agro-ecological differences, each province has diverse El Niño impact observations. For example, survey communities in **Western Highlands Province** (25 community observations) tells a story of cautious optimism rather than crisis during August and September. Multiple notes describe rain having just returned, allowing seedlings and sprouts to revive and green. The severity chart echoes these observations, also revealing that impacts on trade shops and schools are not mentioned in any of the observations in Western Highlands Province (Figure 3).

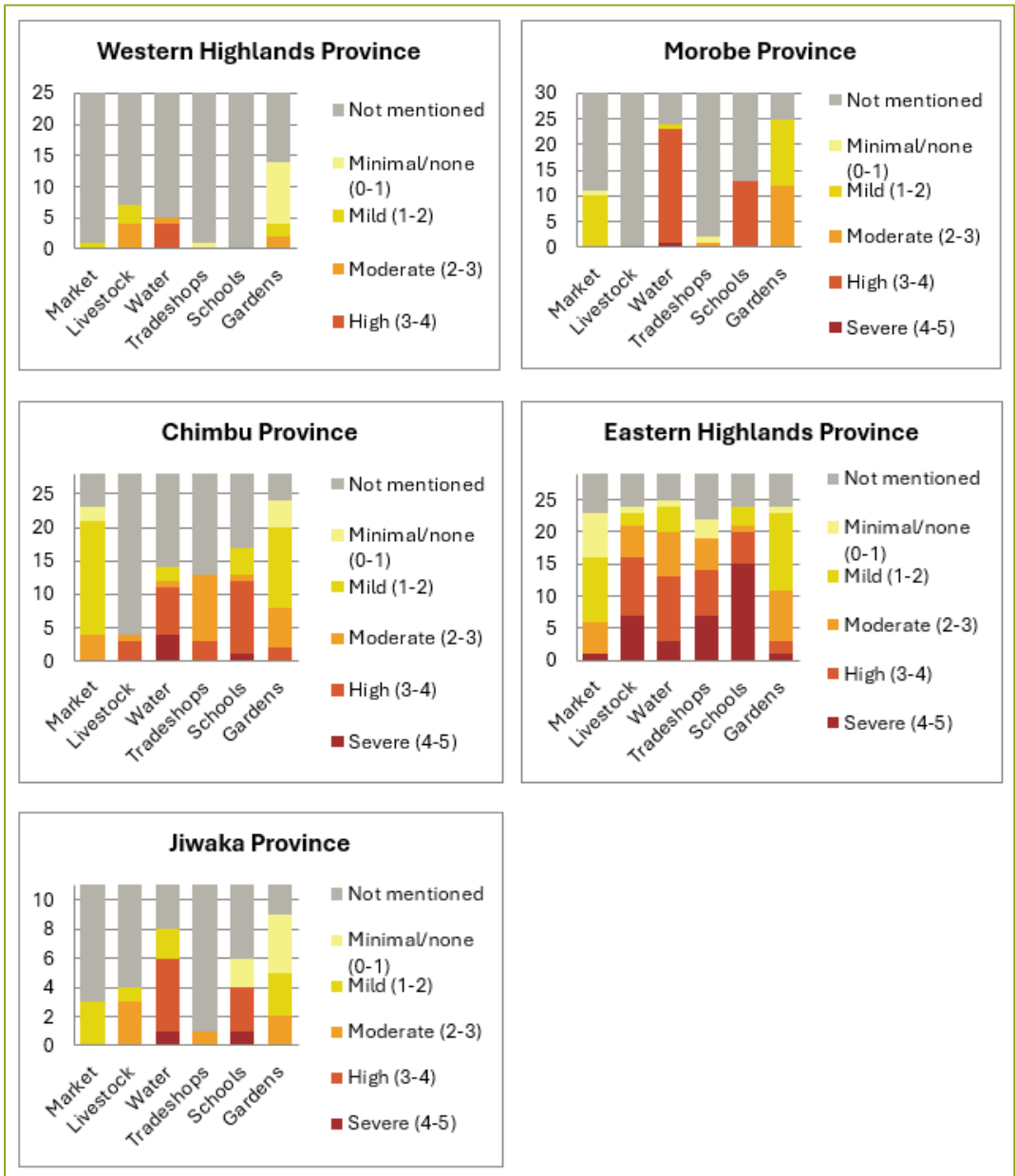
In contrast, **Morobe province** underscores the severity of water shortages. Overall, 22 of the 30 community observations are ranked with the "high" severity band for water availability. Schools closing early for the same reason is mentioned almost as often as decreased water volume. However, livestock is never mentioned as an impact issue in the Morobe community sample.

Chimbu province observations underline severe dry conditions and bushfire as the major impact channel in these communities (30 community observations). Gardens are described as brown with bushfires having "burned down many gardens". Observations on livestock impact are also stark in Chimbu survey communities, describing people killing pigs and selling the meat because there isn't enough food to keep feeding the livestock. Markets are responding to these conditions by increasing the price of food units (e.g., pieces, heaps, etc.) while decreasing the average quantity or size of the marketed unit. For example, while earlier in the year rural aggregators would purchase a 50kg bag of cabbage for K50, the same 50kg bag cost an aggregator about K210 to K250 in September.

Eastern Highlands Province (EHP) provides a good example of why this report is considered illustrative rather than prescriptive (as described in the data methodology section). The observations from the EHP (30 community observations) are the most thematically complete, and thus are the least gray on the severity chart (Figure 3). El Niño impact on school operations is the major impact channel described through EHP's sampled communities. Livestock culling and water availability both range from severe to mild within the EHP sample, split closely along elevation — colder, higher communities report having water taps at the doorstep and healthy livestock, while lower-lying communities report animals going without food and women walking miles for water.

Jiwaka province represents the smallest community sample size (11 community observations). Most of the impact observations from these communities focus on decreased water volume. For example, one observation described the Wagi river as lowered at a point of being "crystal clear", a striking change from its usual muddy state and shallow enough for school children to cross on foot. In contrast to other provinces, garden characteristics focus on pest infestations on taro, sweet potato and cabbage. In particular, a taro pest in the form of a black caterpillar is mentioned that has potentially become resistant to local insecticides.

Figure 3: Number of observations by province, theme and severity rank



Source: PNG Fresh Produce Value Chain Survey, 2026

3. Theme level summary

3.1 Market situation

Not every location reports a market problem. The colder, higher altitude communities where garden crops are less drought stressed, as per August and September conditions, and in communities with gardens that span elevation differences reported less impact from drought compared to others. For the higher altitude communities, frost is a concern; however, for the lower altitude communities, drought seems to be a larger concern. A common observation is that food crops (e.g., tubers) that are generally sold in heaps or bundles are sold at lower quality, resulting in a mixture of small tubers with one or two large tubers included in a heap compared to a heap of all large tubers during normal seasons.

3.2 Livestock

Two separate coping patterns show up in the livestock observations. The first is the culling of pigs to raise cash for food, described mostly in communities in Chimbu province. Sales notices for pig sales are posted along the roads in Chimbu province survey areas. A community in Eastern Highlands Province describes many pigs currently being moved and offered for sale in the community, alongside an observation that only small portions of food are now given to animals leading to livestock malnutrition. The second pattern, seen mostly in Eastern Highlands Province is livestock weight loss where animals are kept but not sold, and are thinning because feed and pasture are in short supply.

3.3 Water

Streams, creeks, and small rivers running low is one of the most repeated observations across the dataset. Larger rivers, such as the Wagi, the Bena, and the Ganigl are described as reduced in volume but still flowing. Two notes describe people now crossing these rivers on foot where before they needed inflated tire tubes, because the water is only knee high.

A common theme across many observations is of women and children carrying buckets for water and households needing to walk further for water. Observations recorded on the time it takes to collect water ranges from about 20 minutes to one hour. Where better water security is reported (Western Highlands Province sample communities), water retention infrastructure such as a solar powered borehole or piped water at the doorstep, or proximity to a natural water source is mentioned as an important water source.

3.4 Trade shops

Rice is not reported as fully out of stock in any of the community observations, however rice prices within the communities are reported as increasing by about 1 PGK for a 1kg bag of rice since June. Whereas a 1kg bag of rice cost approximately 5.5 - 6 PGK in June in most communities, in August and September the price had increased to 7 PGK per kg. Rice scarcity may also be location specific, whereby one community observation described a bale of rice running out in a single day. Similarly, several community observations described larger rice bags being broken down into smaller units for resale at a significant markup.

3.5 Schools

Half-day classes and school closing at 12pm or 1pm instead of the normal 3pm is the single most repeated observation across the dataset and in every province. The stated reasons are high daytime heat, lack of water in school storage tanks, and children not bringing lunch. Specific mentions of children going without lunch include a note that estimates that roughly three quarters of students do not bring lunch in one of the communities. However, it is not clear if this is an aberration from normal school lunch practices in this community.

2.6 Gardens and environment

The recurring image across the enumerator observations is dry, brown, cracked ground with wilted or ruined plants. Root crops, sweet potato and taro, are described as the first to wilt, while cassava, banana, and sugar cane are repeatedly described as more tolerant and still green in the same gardens.

Conclusion and caveats

This analysis is constructed from an in-person community survey where enumerators wrote open-ended observations to 6 specific themes: 1) markets; 2) livestock; 3) water; 4) schools; 5) trade shops; and 6) gardens. The analysis and discussion is constructed from a keyword and phrase matching analysis, not a validated survey instrument or an independently verified measure of conditions on the ground, so the severity scores reflect how an observation was worded rather than a direct measure of hardship.

The overall reported conditions of specific communities and provinces is shaped by differences in how enumerators reported their observations. Communities that were described in detail, reporting on each individual theme in more detail could potentially skew the severity score reported here as broader or more severe for reasons of enumerator writing style as much as real on-the-ground conditions.

It is important to note that the community conditions that are reported in this brief capture a single moment in time from August through September (with the specific date depending on the community visit), so the descriptions of recovery reported in Western Highlands Province, as well as ongoing hardship in other provinces may simply reflect the moment in time that the community observation was recorded. Frequent and ongoing data collection is necessary to maintain up-to-date conditions on the ground.

The findings presented in this brief suggest that this year's predicted El Niño phase is already affecting communities in areas where agriculture surplus is common (along the commercial fresh produce value chain corridor). However, meeting the data needs to judge El Niño severity for specific communities and regions across the country will require more regular, standardized data collection across the country, built around key indicators on agricultural production, food security, and water access. The ongoing initiatives of the Department of Provincial and LLG Affairs to equip ward-level data collection and upload capacity (via internet linkages), together with the World Bank and IFAD-funded PACD 2 project that plans to support and utilize the same ward-level system for frequent monitoring and evaluation may offer a path toward building the database and knowledge system needed to monitor on-the-ground conditions and their deviations from an average season or year.

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