

Anticipating the 2026/2027 El Niño Shock in Papua New Guinea

An Assessment of Rural Household Vulnerability from the 2023 Rural Household Survey

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Key messages

- PNG is entering a period of elevated climate and food-security risk. The developing 2026 El Niño raises the likelihood of drought and agricultural stress, with frost an additional concern in the Highlands. Early reports of falling water levels and frost damage underscore the need for preparedness. Impacts may persist well into 2027, since historically El Niño drought conditions are typically followed by flooding from La Niña climate patterns.
- Households already rely on coping strategies when food and livelihoods are under pressure. The [2023 PNG RHS Report](#) shows that households respond to shocks through mechanisms such as relying on wantok networks, consuming cheaper foods, and increasing labor supply. These strategies provide important short-term support but may be insufficient during severe or prolonged climate shock and can carry longer-term welfare costs.
- Agriculture is a key pathway from climate shocks to welfare. Own production provided 54 percent of food consumed, compared with 38 percent purchased and 7 percent from gifts or transfers. Drought or frost can reduce food availability while increasing market dependence and exposure to higher prices.
- Vulnerability is concentrated but extends beyond the Highlands. Highland areas warrant particular attention because drought and frost can coincide, but climate impacts can also affect other regions through agriculture, livestock, water, transport, and markets.
- Targeting should combine climate exposure with household vulnerability. Priority areas should reflect current climate conditions, drought and frost risk, agricultural conditions, food insecurity, livelihoods, assets, and market access, followed by rapid verification. Continued monitoring of food markets is essential. Because many households rely on

purchased food, changes in food prices, market availability, and access should be monitored closely as El Niño conditions develop. Market monitoring can help identify emerging food-security pressures, inform targeting, and determine when and where assistance or other interventions should be activated.

- The immediate priority is anticipatory action. Government and development partners should prepare food assistance, agricultural and livestock protection, market monitoring, logistics, and delivery systems, backed by flexible financing that can be activated when agreed triggers are reached.
- Donor support should prioritize readiness and flexibility. Key investments include pre-positioning, anticipatory financing, planting material, livestock support, market monitoring, and rapid assessments, tailored to local market conditions.
- The [2023 PNG-RHS](#) provides a foundation for improved climate-risk targeting. Linking household data with rainfall, temperature, drought, NDVI, elevation, agricultural, and market data can improve identification of areas where climate stress is most likely to translate into welfare losses and strengthen anticipatory action.

1. Introduction: Turning Early Warning into Early Action for the 2026-2027 El Niño

El Niño is associated with changes in rainfall and temperature across the Pacific. In Papua New Guinea, previous El Niño events have been associated with drought, reduced agricultural production, food shortages, and frost in high-elevation areas. The 2015–16 event, for example, resulted in significant drought and frost impacts and required a coordinated government and humanitarian response (Government of Papua New Guinea & United Nations, 2016). Previous experience also shows that the effects of El Niño vary across PNG according to elevation, rainfall, farming systems, market access, and the timing of agricultural activities (Allen, Bourke, & McGregor, 2017; Schmidt, Dorosh, & Gilbert, 2021).

The 2026/2027 El Niño is expected to bring increased drought risk to parts of PNG, with frost risk in high-elevation areas. The World Meteorological Organization (WMO) reported in July 2026 that El Niño had developed in the tropical Pacific and was expected to strengthen during July–September, with an increased likelihood of drought and other climate extremes in affected regions (World Meteorological Organization, 2026a). The August 2026 Island Climate Update indicates that drier-than-normal conditions are likely across a large arc extending from Papua New Guinea toward Vanuatu and New Caledonia during August–October (NIWA, 2026). The Government of PNG has also directed provinces and districts to prepare for an extraordinary and prolonged dry season (Government of Papua New Guinea, 2026).

The period of greatest potential impact is expected in the coming months, leaving limited time to strengthen preparedness and early action. The immediate priorities are to identify where assistance is most needed, determine what type of support is appropriate, and ensure that financing, procurement, logistics, and delivery arrangements are in place. Given the short lead time, existing programs and delivery systems should be used wherever possible rather than creating new mechanisms. The effects of El Niño are also likely to differ across locations. Rainfall deficits, temperature, elevation, farming systems, agricultural calendars, market access, and household resources will influence the extent of crop and livestock losses, food shortages, income losses, and food-price increases. A national El Niño forecast therefore does not mean that all areas or households face the same level of risk. These differences are important for deciding where assistance should be concentrated and what form it should take (Australian Bureau of Meteorology & CSIRO, 2024; World Meteorological Organization, 2026a, 2026b).

The [2023 PNG-RHS](#) provides household-level information that can help identify where underlying vulnerability is high. The survey covered 2,699 rural households in 270 communities across 14 provinces and five agroecological zones and collected information on agriculture, food consumption, livelihoods, food security, assets, and shocks (Schmidt et al., 2024). These data provide a baseline for assessing household capacity to absorb another shock. They should be combined with current climate forecasts and information on agricultural conditions, food prices, markets, elevation, and local conditions before assistance is targeted. The main concern is the interaction between expected climate exposure and existing household constraints. A production loss can reduce food available from own farms, lower agricultural income, increase dependence on food purchases, and place additional pressure on savings and other assets. Where markets are

poorly connected, local production losses can also increase prices and reduce food availability (Allen, Bourke, & McGregor, 2017; Schmidt, Dorosh, & Gilbert, 2021).

2. Rural Households Have Limited Capacity to Absorb another Shock

2.1. Food insecurity is already widespread

The [2023 PNG-RHS](#) indicates substantial pre-existing food insecurity among rural households. Seventy-nine percent reported food insecurity, with food shortages lasting 3.8 months on average. Food accounts for approximately 75 percent of household consumption expenditure, while own production provides 54 percent of food consumed, highlighting exposure to both production and market shocks.

Table 1. Selected indicators of rural household vulnerability

Indicator	PNG-RHS finding
Households reporting food insecurity	79%
Average duration of food shortages	3.8 months
Food share of household consumption expenditure	75%
Food obtained from own production	54%
Food obtained from purchases	38%
Food obtained from gifts/transfers	7%
Households reporting drought, 2018–2023	54%
Households reporting food-price increases	53%
Households reporting flooding	47%

Source: Authors' calculations using the 2023 PNG-RHS.

Vulnerability is particularly high in several sentinel locations. Food insecurity affected 97 percent of households in Bitapaka and Kamano No. 1 and 96 percent in Kapao (Aseki), while average food-shortage duration exceeded four months in several locations. These conditions suggest that households in already vulnerable areas may have limited capacity to absorb further production losses or food-price increases. IFPRI's [2023 PNG-RHS](#) analysis indicates limited household food and welfare buffers. Only 45 percent of individuals consumed enough calories to meet the recommended requirement, while poverty was estimated at 43 percent under a cost-of-basic-needs measure and 64 percent under a healthy-diet poverty line. These are sample-specific estimates. This vulnerability supports using historical food insecurity for initial targeting, particularly where shortages persist, combined with current climate exposure, market and agricultural conditions, and rapid food-security monitoring. For donors, this supports early pre-positioning, market-based assistance where markets function, and flexible financing that can scale as conditions deteriorate.

2.2. Dependence on agriculture creates several forms of exposure

An El Niño-related drought could affect household welfare through several interconnected channels. Reduced rainfall, higher temperatures, and frost in some high-elevation areas can reduce agricultural production and household food availability. Production losses may increase reliance on markets, while widespread supply reductions could raise food prices and reduce real purchasing

power. For food-insecure households, these pressures may result in lower food consumption, greater reliance on coping strategies, and depletion of savings or productive assets.

These risks are particularly relevant in rural PNG, where agriculture is central to food access. In [2023 PNG-RHS](#), own production accounted for approximately 54 percent of the value of food consumed, compared with 38 percent from purchases, while food represented about three-quarters of household consumption expenditure. Production losses can therefore affect welfare directly through reduced food availability and indirectly through greater market dependence and potentially higher food prices.

The potential transmission pathway is:

Climate shock → production loss → lower own-food availability → greater market dependence → higher food prices → reduced purchasing power → increased food insecurity and asset depletion.

The strength of these channels will vary across households and locations. Households with diversified incomes, savings, productive assets, own food production, or better market access may be better able to smooth consumption. Poorer and agriculture-dependent households with limited market access may have fewer options to absorb production losses or higher prices. Effective early-action targeting therefore requires considering climate exposure together with existing household vulnerability.

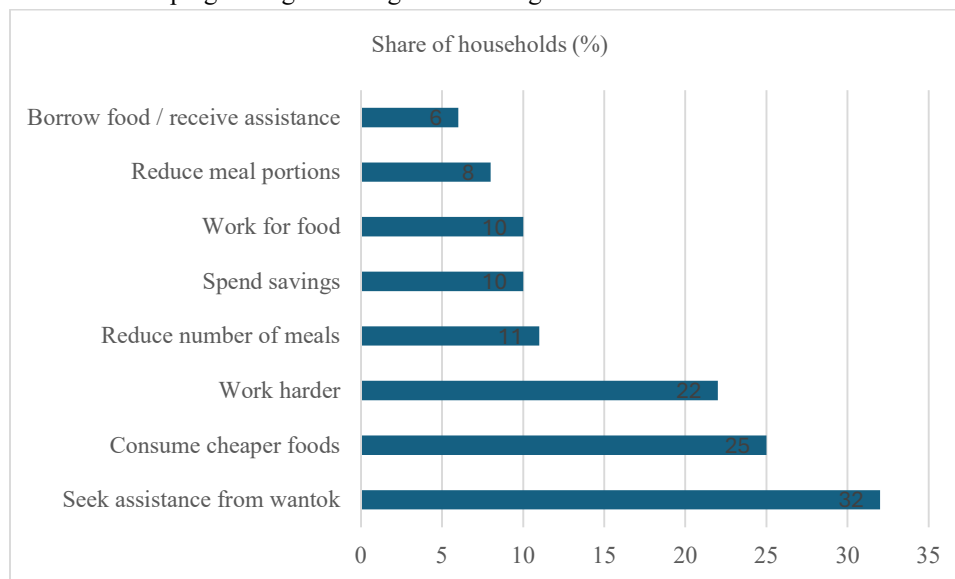
Earlier IFPRI analysis provided a useful benchmark. Potential Impacts of an El Niño Related Drought on Sweet Potato Consumption and Prices in Papua New Guinea, use a partial-equilibrium framework to examine production shocks to sweet potato (Joseph et al., 2024). Their results indicate that substantial production losses could increase sweet-potato prices and reduce household consumption, with effects varying across locations and household groups, particularly in the Highlands where sweet potato is an important food and livelihood crop. These results should not be interpreted as forecasts of the 2026/2027 El Niño impacts. Rather, they illustrate plausible transmission channels. The [2023 PNG-RHS](#) provides a complementary baseline on livelihoods, production, consumption, food security, assets, and prior shocks. Linking these characteristics with spatial climate and environmental information can help identify where climate exposure is most likely to translate into welfare risks.

Future analysis can link [2023 PNG-RHS](#) households to geospatial measures of rainfall, temperature, precipitation variability, and vegetation conditions such as NDVI, and assess alternative drought and food-price scenarios. This can strengthen future climate-risk targeting and policy design. For the present policy brief, however, the priority is to identify where elevated climate exposure overlaps with existing household vulnerability and use this evidence to guide preparedness and early action.

2.3. Existing coping capacity is already under pressure

Rural households in the [2023 PNG-RHS](#) report widespread use of informal and consumption-based strategies to manage food shortages, suggesting that many have limited capacity to absorb another climate shock without reducing food consumption or drawing down livelihood resources. The most common response was seeking assistance through wantok networks (32 percent), followed by consuming cheaper or less-preferred foods (25 percent) and increasing labor supply (22 percent). Others reported reducing meal frequency or portion sizes, spending savings, working for food, or borrowing food and receiving assistance.

Figure 1. Household coping strategies during food shortages



Source: Authors' calculations using the 2023 PNG-RHS.

These strategies differ in their implications for resilience. Wantok support can provide an important buffer, while increased labor supply may protect consumption where income opportunities exist. However, their effectiveness may decline during a widespread climate shock as informal networks face greater demand and frost, drought, or reduced agricultural activity constrains earning opportunities. Other responses protect food availability in the short term but may carry longer-term costs. Cheaper foods or smaller and fewer meals can reduce dietary quality and intake, while spending savings or borrowing can weaken households' ability to cope with subsequent shocks.

The policy implication is not to eliminate coping, but to prevent a temporary shock from exhausting the mechanisms households need to recover. Anticipatory action should protect immediate food access while safeguarding productive assets, income, savings, and nutrition. For donors and operational partners, this supports early food assistance alongside livelihood protection, using community and wantok networks for delivery while recognizing their limits. The objective is to reduce reliance on erosive coping before households are forced to deplete savings, sell assets, or reduce food intake.

3. Where Climate Exposure and Household Vulnerability Overlap

The areas of greatest concern are not necessarily those with the highest climate exposure alone. Early action should prioritize locations where drought and frost exposure overlaps with high household vulnerability, agricultural dependence, and limited access to food and markets. The same rainfall deficit can have different welfare consequences depending on household resources, farming systems, elevation, agricultural calendars, and market connectivity. High-elevation Highland communities warrant particular attention because drought may coincide with frost. Previous El Niño events caused substantial damage to sweet potato and other crops, while prolonged dry conditions reduced food production and water availability (Government of Papua New Guinea & United Nations, 2016; Allen, Bourke, & McGregor, 2017). Current information also points to elevated dry-season and frost concerns in parts of the Highlands (NIWA, 2026). However, drought risk extends beyond the Highlands, affecting agriculture, livestock, water availability, and food markets in other regions.

A practical targeting framework

The [2023 PNG-RHS](#) provides a useful vulnerability baseline, including food insecurity, food-shortage duration, agricultural dependence, assets, livelihoods, and previous exposure to shocks. These indicators should be combined with current forecast rainfall, temperature and frost risk, elevation, vegetation and agricultural conditions, food prices, and market access.

Table 2. Prioritizing areas for early action: climate exposure and household vulnerability

	Low climate exposure	High climate exposure
High household vulnerability	Prepare and monitor	Priority 1: Early action
Low household vulnerability	Routine monitoring	Priority 2: Targeted preparedness

Note: Climate exposure combines rainfall deficits, temperature/frost risk, elevation, vegetation, and agricultural conditions. Vulnerability draws on selected [2023 PNG-RHS](#) indicators. Classifications are indicative and should be updated using current climate, agricultural, market, and administrative information. Priority locations are not predetermined beneficiary areas.

Source: Authors' analysis of the 2023 PNG-RHS and current climate and agricultural information.

Immediate resources should focus first on where climate exposure and household vulnerability are both high. High-exposure/low-vulnerability areas may require agricultural preparedness and monitoring, while highly vulnerable areas with lower current exposure should remain under observation and have contingency arrangements.

Early action should reflect the likely impact pathway:

- Drought + high food insecurity: prepare food, water support, and market monitoring.
- Drought + agricultural dependence: protect planting material, strengthen extension, and prepare rapid replanting.
- Drought + frost + high elevation: strengthen frost monitoring and crop protection and pre-position planting material, livestock feed, and veterinary support.

- Climate exposure + weak market access: assess food availability and transport constraints and, where needed, pre-position essential supplies before determining whether the type of assistance that is feasible.

Overlay, verify, and trigger

Targeting should overlay climate exposure and household vulnerability, verify priority areas using current government, agricultural, market, and field information, and trigger agreed preparedness or early-action measures when predefined conditions are reached. This creates a dynamic targeting system rather than a static vulnerability map. Climate information identifies increasing exposure; household data identify limited capacity to absorb the shock; and current field and market information determines whether assistance is needed and which instrument is appropriate. The [2023 PNG-RHS](#) should therefore be treated as a vulnerability baseline, not a beneficiary list, with priorities updated as conditions evolve. The key principle is that neither vulnerability nor climate exposure alone should determine targeting. The strongest case for early action arises where both are elevated and current evidence indicates likely losses in food availability, income, productive assets, or market access.

4. Priority Policy Actions for Government and Development Partners

With the expected impact period approaching, the priority is to ensure that agreed assistance reaches the areas and households facing the greatest risks.

4.1. Protect household food consumption

In high-risk areas where shocks coincide with household vulnerability, the government and development partners should ensure preparedness for the timely provision of food assistance and livelihood support. Preparedness should include financing, procurement, logistics, beneficiary verification, market monitoring and implementation systems. Early support is critical to prevent food shortages and reduce the adoption of negative coping strategies than erode household resilience (World Food Programme, 2023).

4.2. Protect agricultural production

Agricultural assistance should focus on reducing production losses and supporting rapid recovery. Priority actions include protecting and pre-positioning planting material, preparing rapid replanting arrangements, strengthening extension services, providing appropriate local agricultural advice, and conducting rapid crop-loss assessments following drought or frost. Sweet potato and other crops central to Highland food systems warrant particular attention because losses can affect both household food supplies and livestock feed (Allen, Bourke, & McGregor, 2017). A rapid agricultural recovery facility could provide financing for planting material, inputs, transport, extension, and replanting once agreed conditions are met.

4.3. Protect livestock and productive assets

Where crop losses reduce livestock feed, households may sell animals or reduce their productive herds. Early support should therefore consider livestock feed, water support, veterinary services, animal-health monitoring, and protection of breeding stock. Protecting productive assets is particularly important because asset sales can provide short-term consumption support while weakening household recovery capacity.

4.4. Monitor food markets

Market monitoring should begin before the main impact period and should track staple-food prices, market arrivals, local stocks, transport costs, agricultural-input prices, livestock prices, and availability of planting material. This information should inform decisions on food assistance is appropriate and help identify locations where local production losses may generate wider market pressures. Remote communities deserve particular attention because local production losses and transport constraints can reinforce one another.

4.5. Maintain nutrition and social protection

Where food shortages persist, nutrition services and social protection should be linked to the response. The objective is to prevent temporary food shortages from resulting in sustained reductions in meal frequency, diet quality, and food consumption. Existing social-protection and community programs should be used where they can provide rapid coverage.

5. Financing, Coordination and Delivery

The time available before the expected impact period is short. Financing, procurement, beneficiary identification, transport, and delivery arrangements therefore need to be agreed before assistance is required.

Table 3. Proposed early-action sequence

Stage	Decision	Main action
Monitor	Is climate risk increasing?	Update forecasts, rainfall indicators and frost-risk information
Prepare	Which areas and households require attention?	Update vulnerability information and logistics
Trigger	Are agreed climate and vulnerability thresholds met?	Release pre-arranged financing
Respond	Are households experiencing losses?	Deliver food, agricultural and livestock support
Assess	What happened?	Rapid household, agricultural and market assessment
Recover	What support remains necessary?	Replanting, livelihood and social-protection support

Source: Authors' assessment.

Donor priorities

Development partners should concentrate on support in five areas:

1. Preparedness financing: Resources for forecasting, mapping, market monitoring, procurement, logistics, and pre-positioning of life-saving and essential stock.

2. Anticipatory financing: Funding that can be released when agreed climate and vulnerability thresholds are reached.
3. Agricultural and livestock support: Planting material, extension, feed, veterinary services, and rapid replanting.
4. Food assistance: Temporary support for households facing food shortages and reduced purchasing power.
5. Follow-up and evaluation: Resources for rapid household, agricultural, market, and post-assistance assessments.

Coordination

Climate information should be coordinated by the National Weather Service and other relevant technical agencies. Agricultural and household information should be shared among the Department of Agriculture and Livestock, provincial governments, humanitarian agencies, development partners, research institutions, and the [Food Security Cluster](#). The Food Security Cluster provides an important platform for coordinating assessments, identifying geographic and operational gaps, and reducing duplication among partners (Singh et al., 2026). IFPRI's comparative contribution is in household vulnerability analysis, spatial targeting, monitoring, and evaluation, using the [2023 PNG-RHS](#) and complementary climate, environmental, agricultural, and market information. Existing delivery systems should be used wherever possible. The objective should be to minimize the time between a decision to act and actual assistance reaching households.

6. Future Work: Strengthening Climate-Risk Monitoring and Targeting

The [2023 PNG-RHS](#) provides a strong household-level baseline on food security, agricultural livelihoods, consumption, assets, and coping capacity. However, it cannot identify current exposure to the 2026/2027 El Niño. Immediate targeting should therefore combine the [PNG-RHS](#) vulnerability baseline with current climate forecasts, agricultural conditions, market information, and local assessments.

Future analysis can strengthen this framework by linking [PNG-RHS](#) households and communities with spatially and temporally matched data on rainfall, temperature, drought, NDVI, elevation, market access, and agricultural conditions. This would allow household food-security and welfare outcomes to be assessed alongside local climate conditions and strengthen climate-risk targeting (World Bank, 2022; IPCC, 2022). Attention should be given to the interaction between rainfall, temperature, and vegetation conditions. Combining these indicators with household characteristics can help identify where climate stress is most likely to translate into welfare losses, particularly among households that depend heavily on agriculture, have limited assets, faced high food expenditures, or had weak market access (World Bank, 2021; WFP, 2023).

Future work could also examine drought and food-price scenarios. Earlier IFPRI analysis of El Niño-related sweet-potato production shocks provides a useful benchmark for assessing potential effects on prices and household consumption. Joseph et al. (2024) show that simulated

production reductions can generate substantial price increases and consumption losses, varying across locations and household groups. These are scenarios, not forecasts of the 2026/2027 event. Extending this analysis could assess alternative production and price shocks and their implications for food access and welfare. Over time, integrating household, climate, agricultural, environmental, and market data could support a more actionable climate-risk monitoring system and strengthen anticipatory financing, social protection, agricultural resilience, and disaster preparedness.

Importantly, this analytical work is a medium-term extension, not a prerequisite for immediate action. Available climate forecasts and the PNG-RHS baseline should be used now to support targeting, financing, procurement, logistics, and delivery. Subsequent analysis can improve understanding of how climate variability translates into agricultural losses, market pressures, and household welfare outcomes.

Working with development partners

For development partners, the priority is to translate available evidence into timely decisions, rather than wait for a complete analytical system. Near-term support should focus on preparedness, targeting, market monitoring, and delivery capacity, while subsequent analysis strengthens the evidence base for future events. Linking household vulnerability with observed climate and environmental conditions can help identify where limited resources are most likely to have the greatest protective effect and improve future targeting, climate-risk financing, and program design (WFP, 2023).

7. Conclusion

The 2026/2027 El Niño is expected to increase drought risk across parts of Papua New Guinea, with frost a particular concern in high-elevation areas. Previous El Niño events demonstrate the potential for agricultural losses, food shortages, and frost damage, particularly in the Highlands (Government of Papua New Guinea & United Nations, 2016; Allen, Bourke, & McGregor, 2017). The [2023 PNG-RHS](#) indicates limited capacity among many rural households to absorb another shock: 79 percent reported food insecurity, food shortages lasted 3.8 months on average, and food accounted for approximately 75 percent of household consumption expenditure. More than half reported drought and food-price increases during 2018–2023 (Schmidt et al., 2024).

The immediate priority is to identify where climate exposure and household vulnerability overlap. The [PNG-RHS](#) provides an important baseline, but current climate forecasts, agricultural conditions, food prices, market access, elevation, and local information are needed to refine priorities and guide operational decisions. This is consistent with evidence that El Niño-related agricultural shocks can affect locations and household groups differently (Joseph et al., 2024).

Priority actions for government and development partners are to:

- Refine targeting by combining current climate information with the PNG-RHS vulnerability baseline.
- Prepare food-security support, such as food assistance, where conditions are warranted.

- Protect agricultural production and recovery through planting material, extension, and rapid replanting, particularly in drought- and frost-prone areas.
- Support livestock-dependent households where feed, water, or animal-health risks emerge.
- Strengthen market monitoring of food prices, availability, transport constraints, and agricultural inputs.
- Finalize financing and delivery arrangements for procurement, logistics, targeting, and coordination so actions can be implemented promptly.

The [2023 PNG-RHS](#) should be treated as a vulnerability baseline rather than a current beneficiary list. Focused follow-up during and after the event can help IFPRI and partners document impacts, monitor recovery, and assess whether assistance reached priority communities in a timely manner. It can also strengthen the evidence base for future climate-risk financing, agricultural resilience, and social protection. For now, the priority is practical preparedness and early action, supported by close monitoring and adaptive response.

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