Data and analysis approaches to inform policy dialogue in data scarce countries

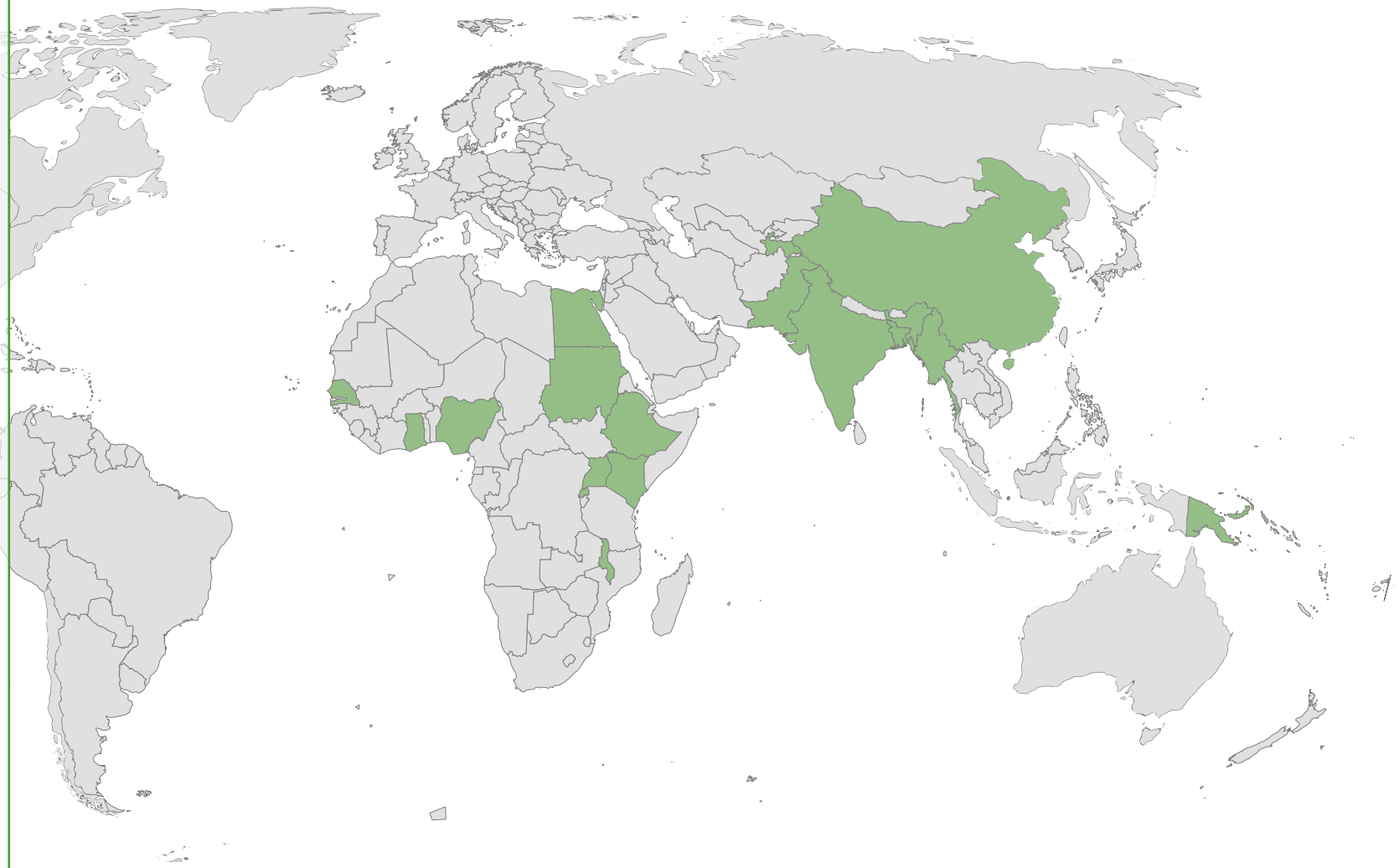
Emily Schmidt
Senior Research Fellow and Papua New Guinea Country Program Leader
International Food Policy Research Institute
e.schmidt@cgiar.org

Asia and the Pacific Food Security Forum 2024
Manila, Philippines

April 11, 2024

IFPRI Regional Offices, Country Offices and Strategy Support Programs

- Designed for long-term engagement
- Country-owned, demand-driven research and analysis
- Capacity sharing through seminars, short courses and collaborative research
- Provide policymakers, donors, civil society, media with timely, policy-relevant research and support evidence translation



IFPRI

CGIAR

Data scarce environments require innovative approaches to fill gaps in a cost effective and timely manner

- IFPRI is working in a variety of countries where:
  - data collection is expensive
  - transportation is challenging
  - security is questionable
- Data scarce environments are often coupled with a lack of data analysis capacity
- These environments require innovative data collection and analysis methods and **ongoing in-country collaboration and capacity strengthening**

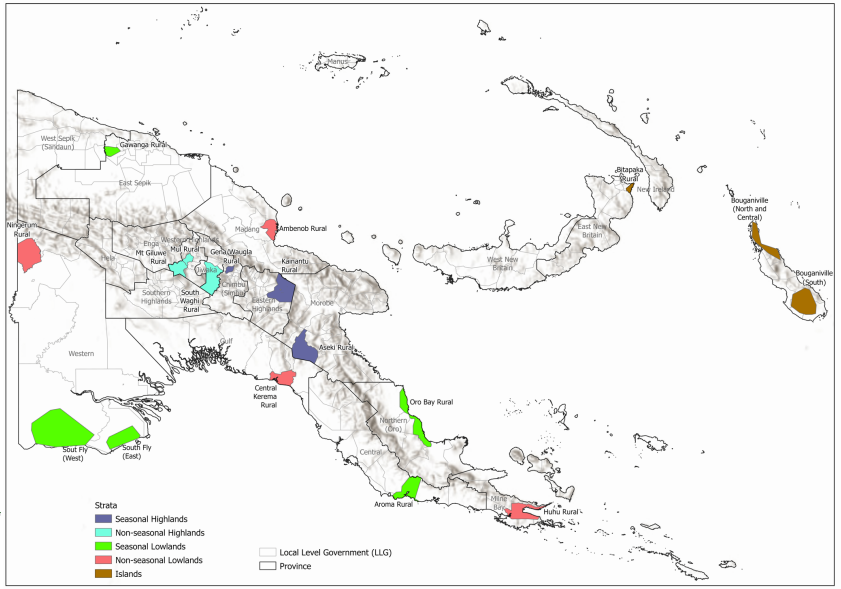
IFPRI

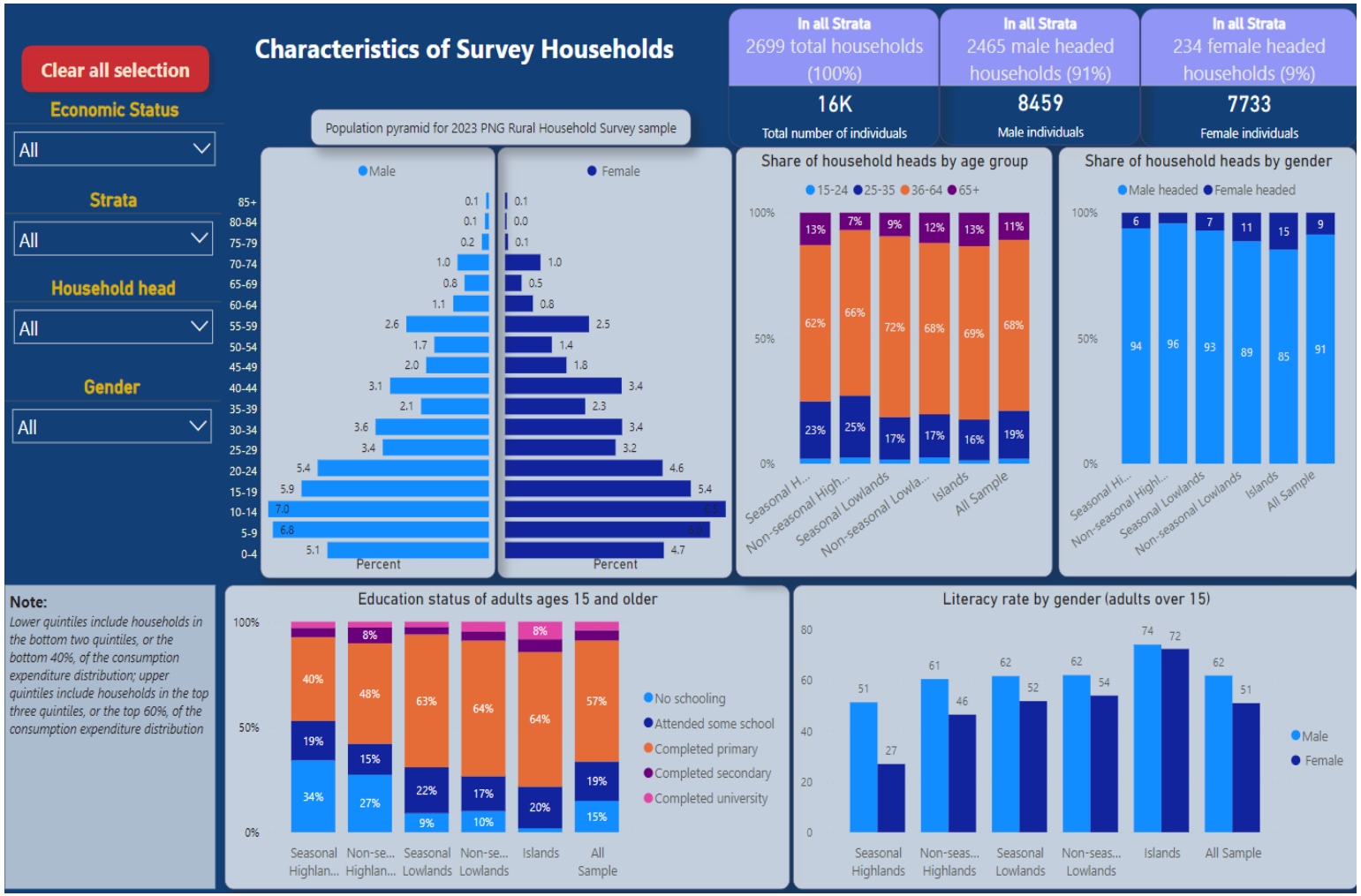
CGIAR

Papua New Guinea: Filling data gaps on household livelihoods

PNG country strategy support program

- **PNG Rural Household Survey 2023**: across diverse agro-ecological zones:
- **Goal**: Inform livelihood profiles, consumption expenditure, anthropometry
- **Ongoing investment**: in capacity strengthening and outreach

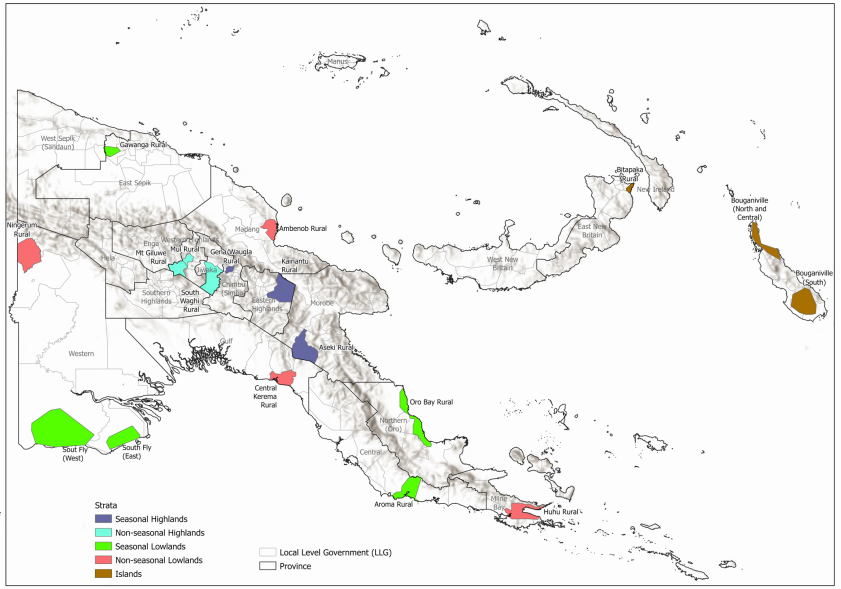


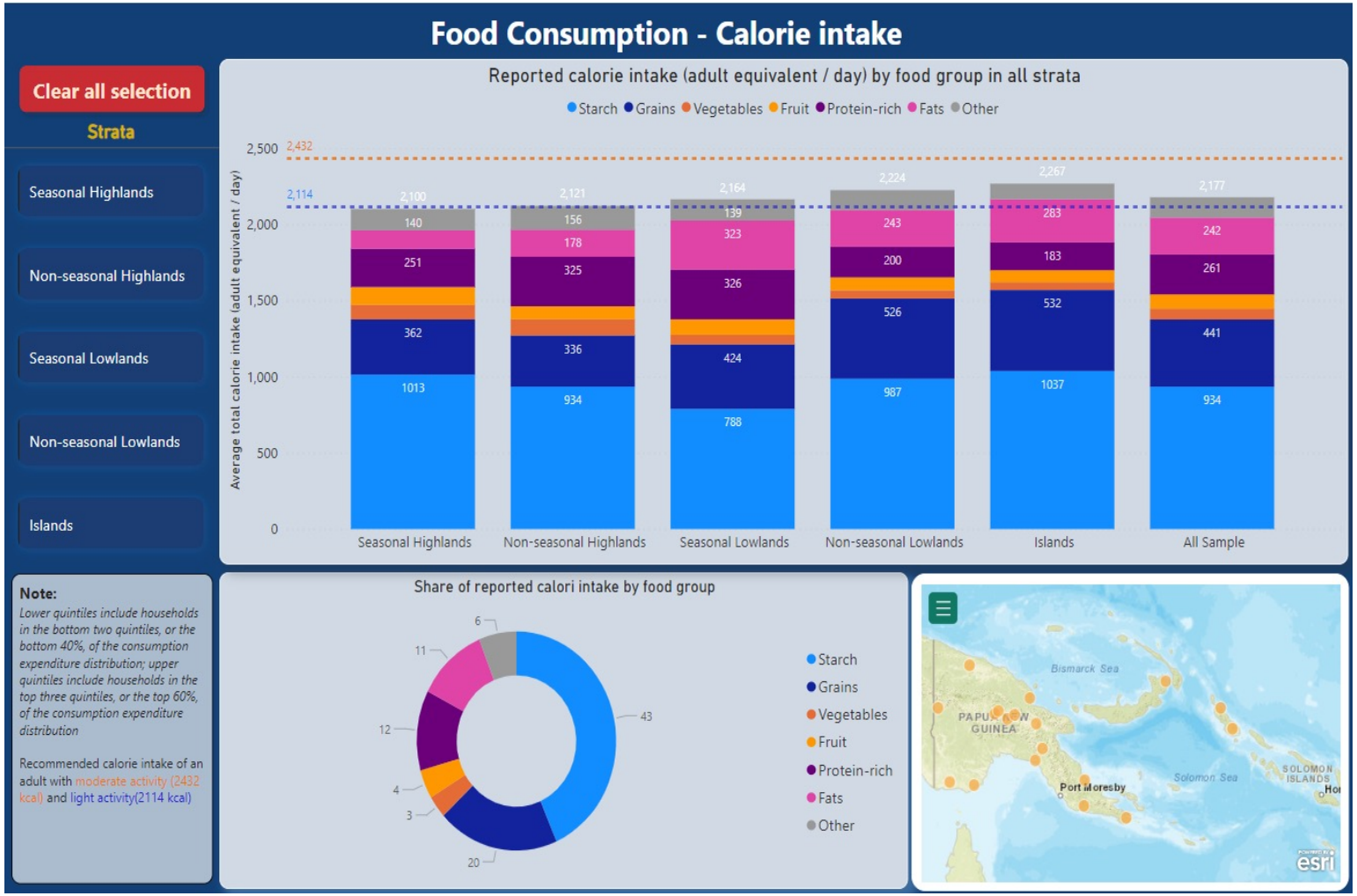


Papua New Guinea: Filling data gaps on household livelihoods

PNG country strategy support program

- Most expansive consumption expenditure survey since national HIES 2009/10
- Use survey data platform to engage policymakers, build interest from students and youth, and inform program planning.





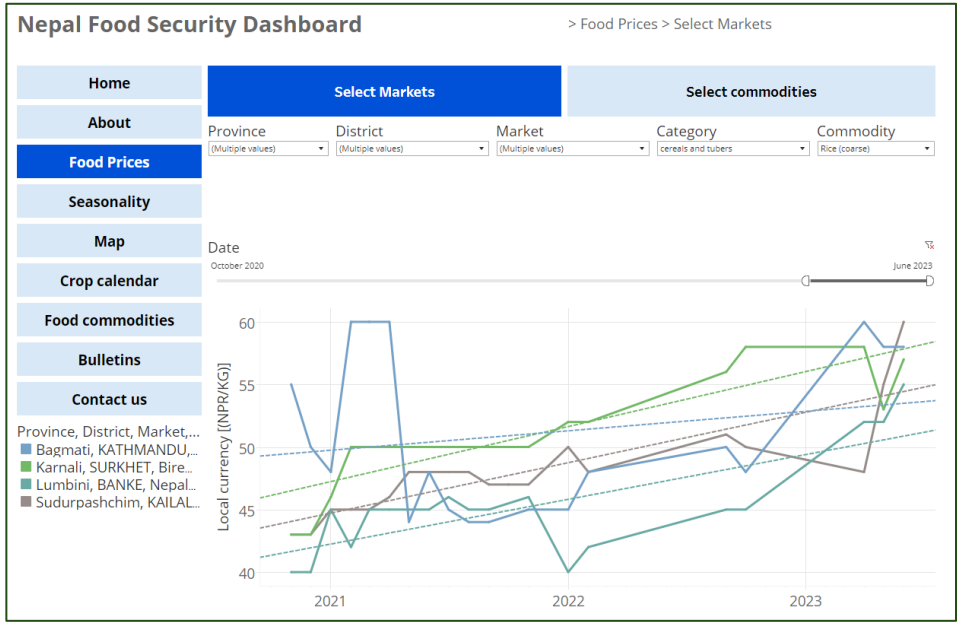
Nepal: Providing real-time food price data analysis across the country

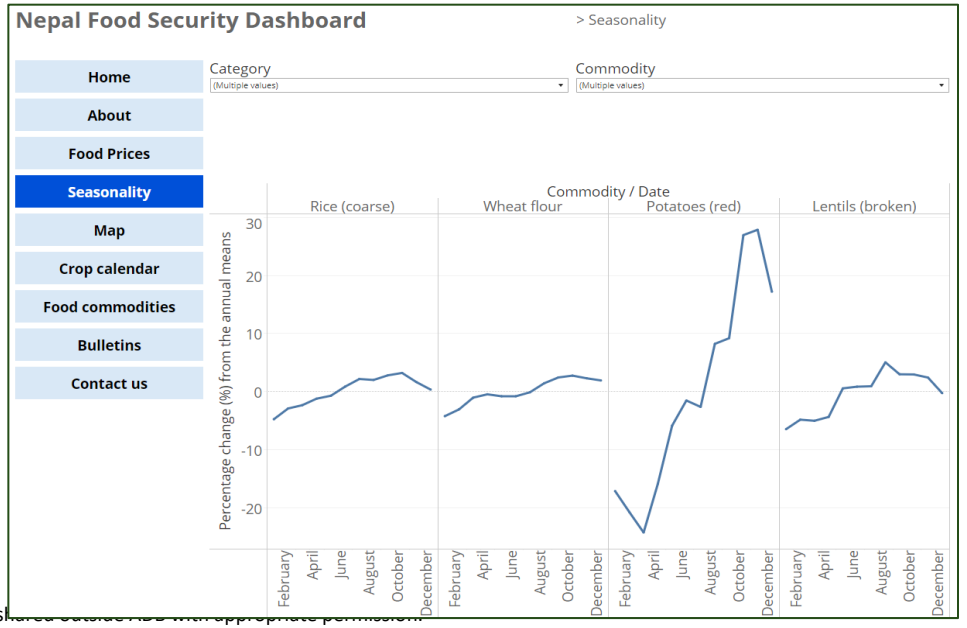
Nepal food security dashboard

- Used for real-time monitoring of food prices and food security in Nepal.

- Allows users to explore food price data of key commodities over time, comparing prices across markets, commodities, and seasons.

- Extending data and analysis to easily accessible platforms facilitates long-term research engagement and immediate policy query needs.





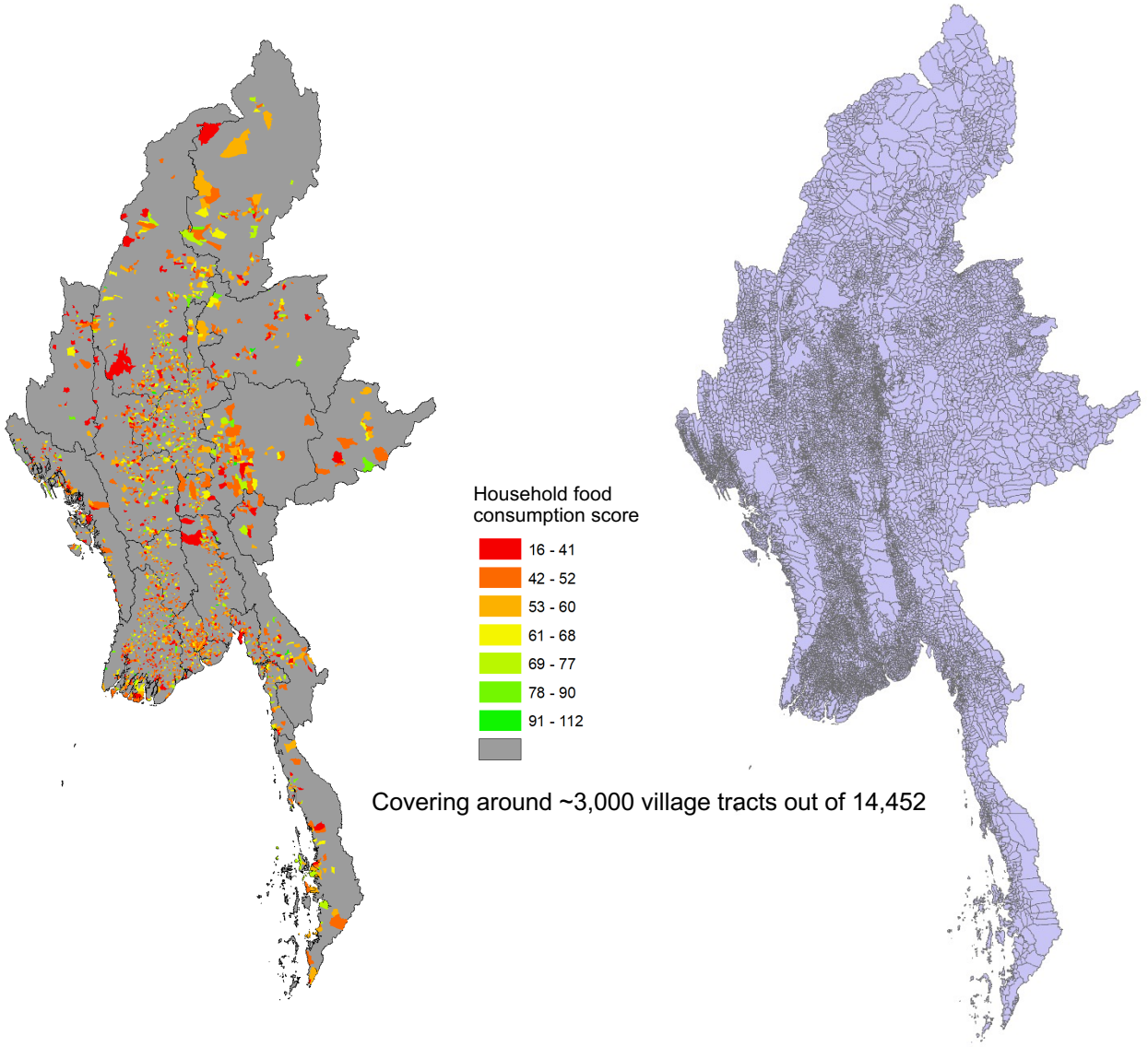
Myanmar: tracking household and individual welfare during simultaneous crises

Myanmar Agricultural Policy Support Activity

- Initiated nationally representative (state and regional) household surveys by phone
  - Interview appx. 13,000 households three times a year
  - Focus on food security, diet diversity, livelihoods, coping etc.

- **Challenge:** Obtain more granular estimates of food security to improve targeting of humanitarian interventions

- **Advantage:** IFPRI in collaboration with a variety of partners has been working in Myanmar since 2014 to co-create evidence-based analysis

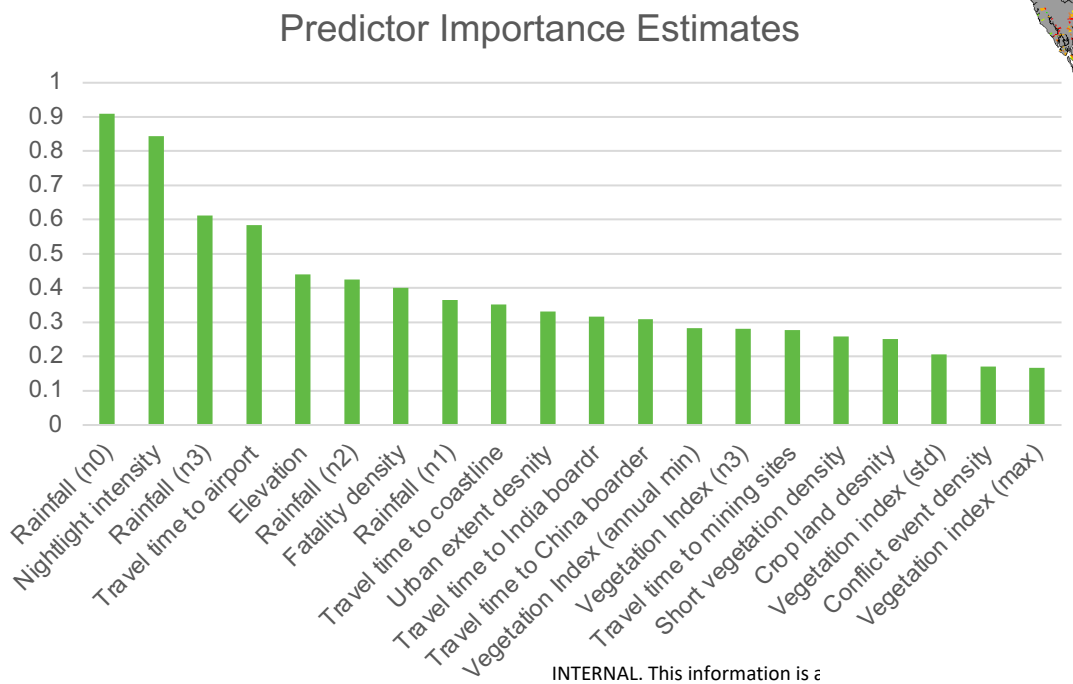


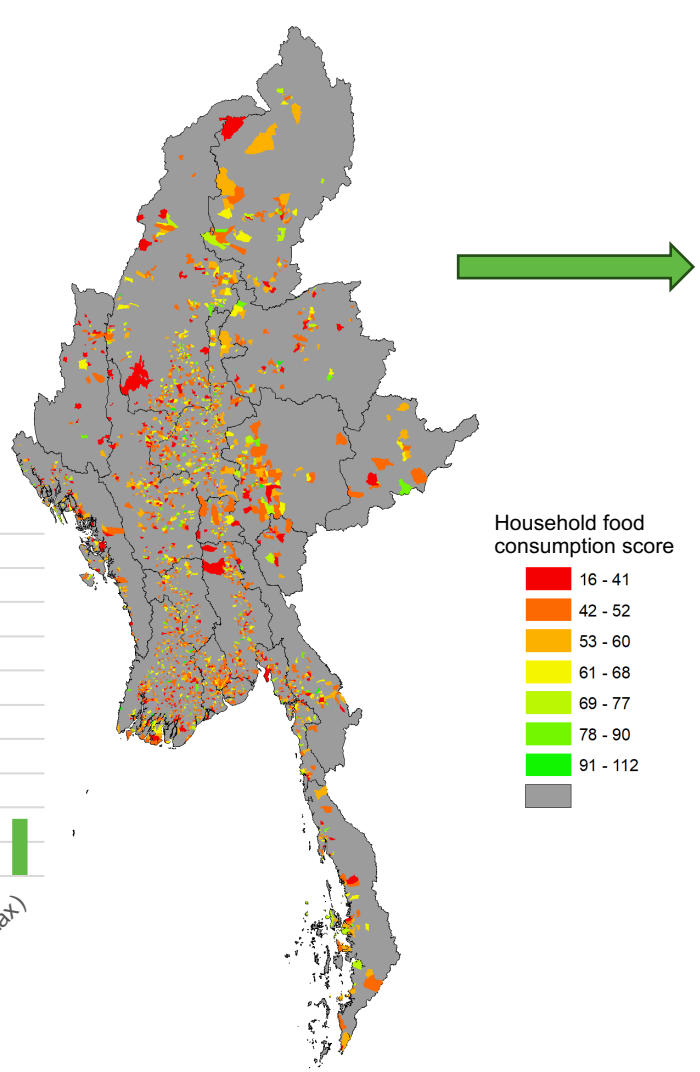
IFPRI

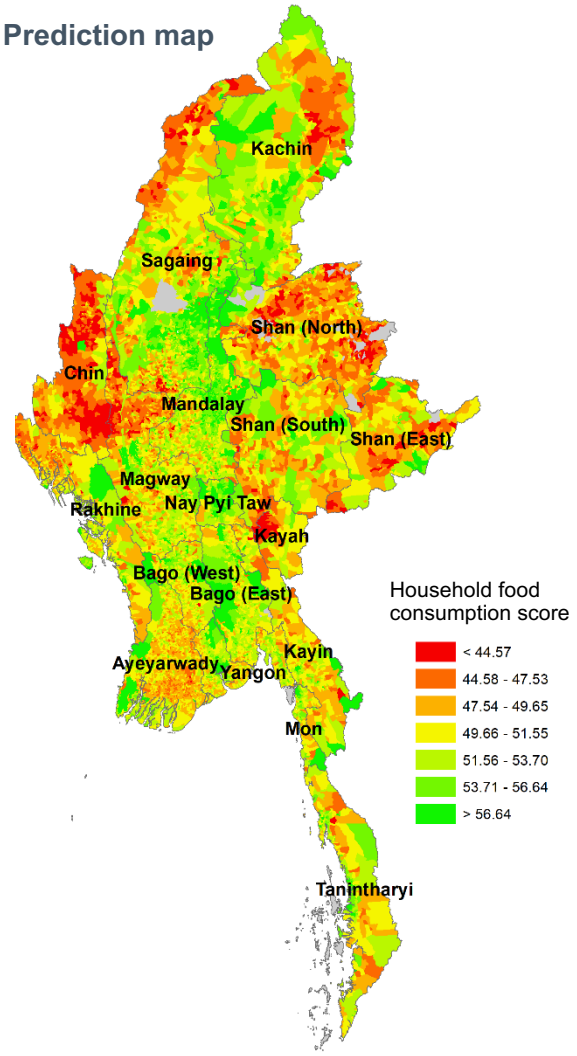
CGIAR

Myanmar: tracking household and individual welfare during simultaneous crises

- **Innovative data exploration**: combine phone survey data with machine learning and moderate resolution satellite imagery to provide spatially explicit estimates of welfare measure at fine resolution
  - Inspired by previous work on socioeconomic mapping.







Source: Guo et al., forthcoming

Reliable crop production statistics across a variety of data-scarce areas

Challenge

- Reliable crop production statistics is crucial for policies and relief assistance yet often not available when needed the most.
- Remote sensing-based crop analytics can be effective yet limited by lack of ground-truthing data

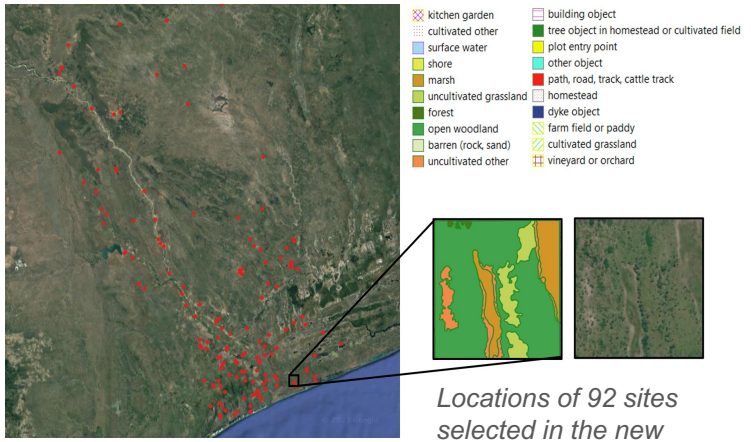
Opportunity

- Analyze the spatiotemporal patterns of satellite remote sensing-derived vegetation indices to develop area sample frames dynamically.
- Use a combination of ground-truth and machine learning to estimate crop production statistics

Supporting technology

- Unmanned Aerial Vehicle: In-field analysis of UAV-captured imagery within *minutes* → Allows real-time monitoring of smallholders' plots. Not constrained by clouds.
- Digital crop monitor: Solar-powered hyperlocal, real-time sensing of weather, water accounting, and canopy management data.

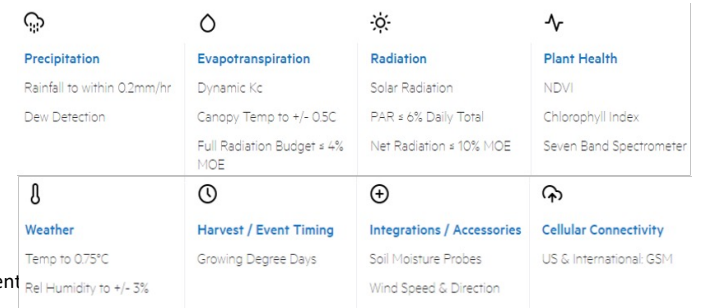
Pilot: Enhanced Monitoring of Food Security in Mozambique

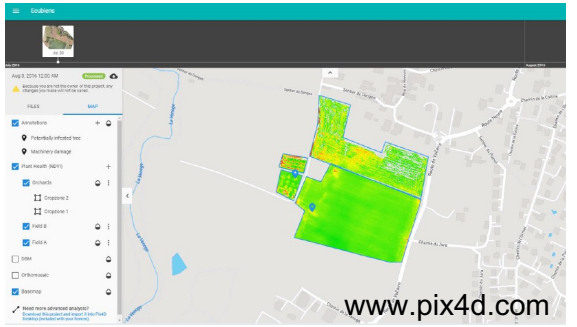


Locations of 92 sites selected in the new area sample frame

Enumerators and the groundtruth collection app

Supporting technology





IFPRI

CGIAR

Papua New Guinea: Examining climate change risk in agriculture

Climate change projections, 2020 to 2045

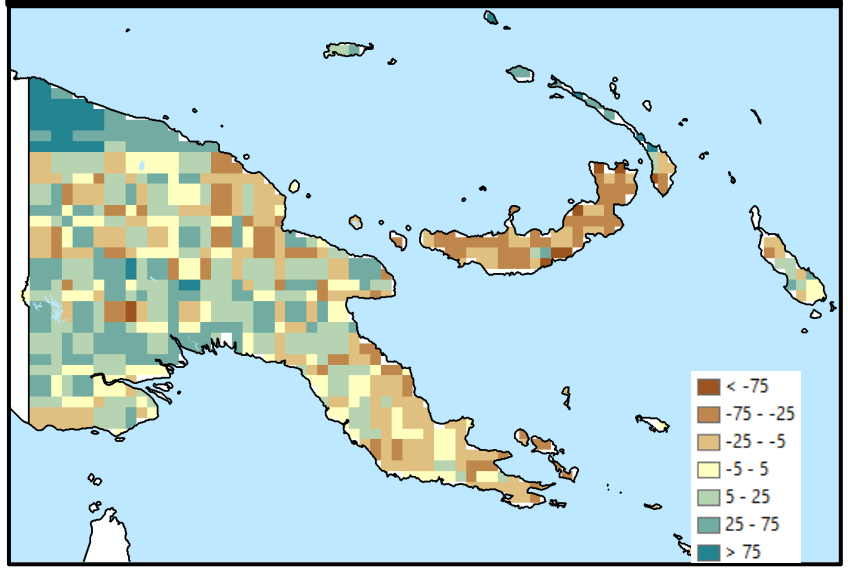
- Compare the median of the climate of 2020 to the median of the climate of 2040s under the higher emissions scenario (combination of MIT-IGSM climate ensemble & AgERA5 climate models)
    - Western portion of the country is projected to have higher rainfall on average (green pixels)
    - Much of the eastern part of the country is projected to be slightly drier (brown pixels)

Frequency of low rainfall events, 2020 to 2045

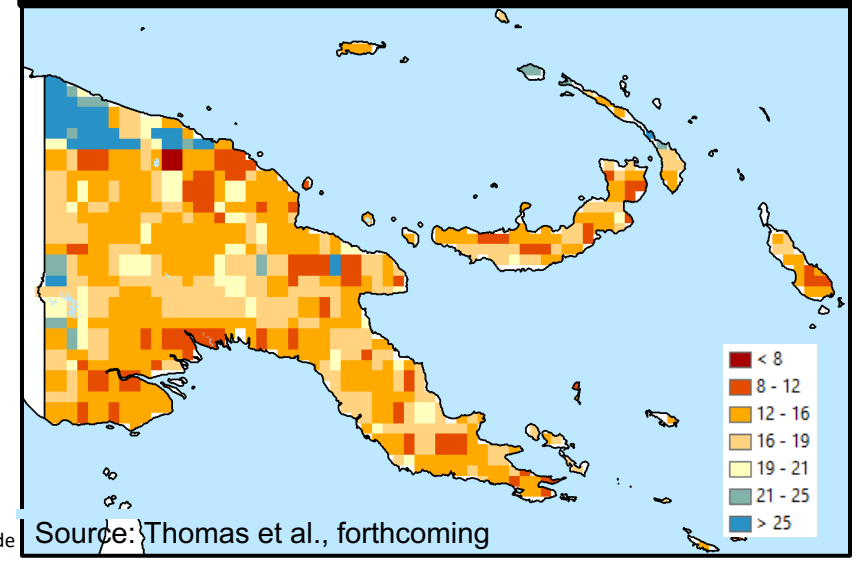
- Most of the country will have an increase in frequency of low rainfall events
    - A value of 10 (orange/red color in map) indicates that a 1-in-20-year event in 2020 would become a 1-in-10-year event in the 2040s

- Disclaimer: Results are preliminary
- Calculations based on a random sample of 1,000 climates from a large ensemble of 500,000.

Change in precipitation, millimeters



Frequency in 2040s of 1-in-20 low-rainfall year

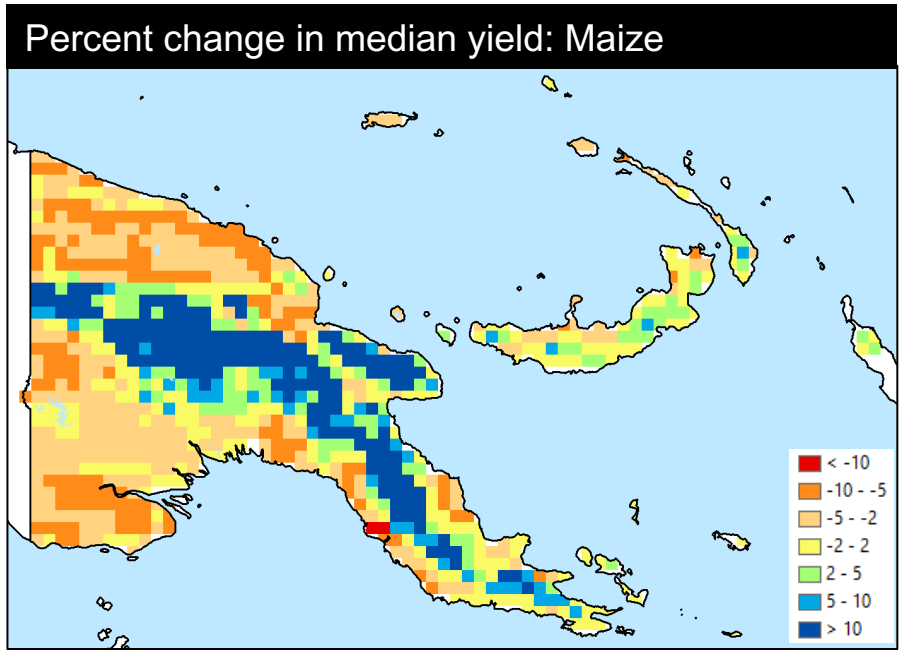


Source: Thomas et al., forthcoming

Papua New Guinea: Examining climate change risk in agriculture

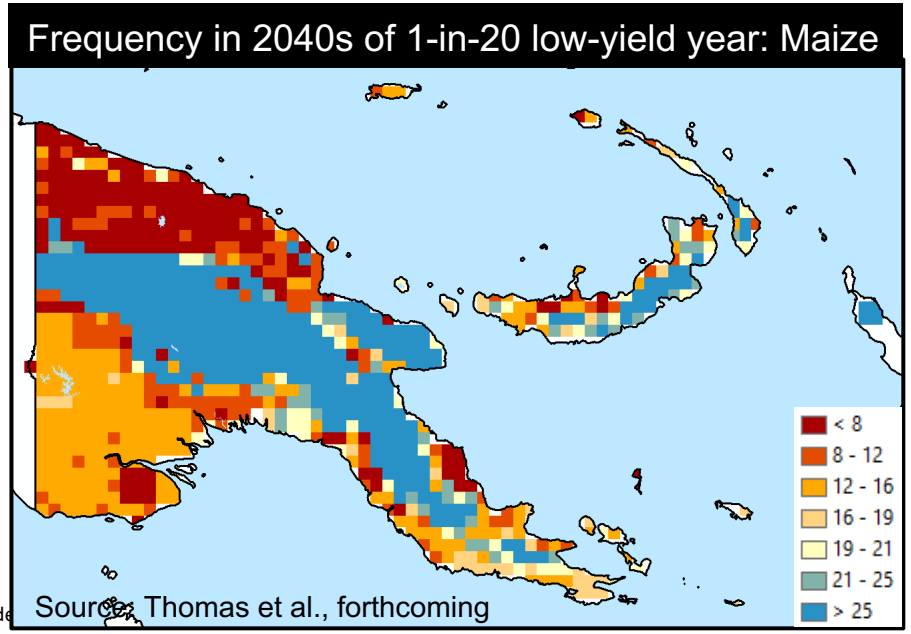
Climate impact on rainfed maize, 2020-2045

- Yields calculated using a crop yield emulator based on output from DSSAT crop model, incorporating climate model outputs.
  - Excluding high elevation areas: climate change will reduce maize yields by 2 to 10 percent.
  - Highlands: maize yields increase (increases in temperature) but base yields (2020) are low
  - Preliminary results: Further ground-truthing is needed



Frequency of 1-in-20-year low maize yield events

- There is an increase in frequency of 1-in-20-year low-yield events at lower elevations.
- Frequency of 1-in-20 event would become a less than 1-in-8 year event (dark red color) in the 2040s in Northwestern part of country



- Disclaimer: Results are preliminary

Filling the data gap: strong emphasis on local collaboration and partnership

Collaborative Research

- **Co-create** with a variety of in-country partners: universities, research institutes and other government stakeholders
- **Collaborate** with a variety of international development and research partners, donors, and private sector

Capacity strengthening

- **Demand driven**, timely, and medium- to long- term engagement
- Building a network of human capability in country with linkages to international partners and support

Policy dialogue

- Hands-on collaboration with government partners at different levels (federal and provincial)
- Annual workshop on research results and convening of national agriculture research institutes
- Collaboration with international development partners

IFPRI

CGIAR

Thank you!

Emily Schmidt
e.schmidt@cgiar.org

IFPRI

CGIAR