

# The Critical Role of Agriculture in Job Creation and Poverty Reduction

UPNG-ANU Seminar  
July 4, 2025



# Motivation

## **The new updated poverty and well-being trends highlight a need to accelerate progress**

- There was little progress between 2009 and 2016-18 on poverty reduction and improvements in well-being
- There has been some evidence of improvement in the past 5 years but more needs to be done

## **There are strong reasons to think agriculture is a critical sector that will deliver income growth to the population**

- Job and income growth follows recognizable patterns across countries- workers move from subsistence and less productive production to more commercialized and off-farm employment
- Characteristics of PNG's agricultural sector suggest that the country is at the beginning stages of this transformation

## **There is important information in the national statistical system about agriculture that is underutilized**

- Clear gaps in the statistical infrastructure on agriculture statistics
- Much of the analysis of agriculture has bypassed the traditional and nationally representative surveys
- But elements of the statistical system offers important snapshots of agriculture in the country that could be used in the policy dialog

# Summary

**Description of how the national statistical system (NSS) does and does not address agriculture**

**Findings from the NSS that could potentially support the policy dialog**

- Snapshot of agriculture in the country- triangulating between data on employment, agricultural production, and consumption
- Simulations that illustrate the potential poverty reduction that agricultural development could deliver
- Estimates of how rapidly agricultural development is occurring using nationally representative trends in key variables associated with agricultural employment

**Discuss how these findings fit in the broader discussions on agriculture in the country**

# What are the main messages?

1. Agricultural information in the national statistical system (NSS) needs to be better utilized AND more investments need to be made to improve the coverage of agriculture in the NSS
2. Development of commercial agriculture and off-farm sectors leads to the largest poverty reduction
  - But poverty gains are maximized when incomes in subsistence farming are also improved
3. Progress on improving agricultural incomes has been slower than expected- urges a call to action
  - Little evidence of substantial increase in commercialization of agriculture
  - Little evidence of substantial income increase in any agricultural subsector

# What can we do about this?

**But other work illustrates that there are interventions that work at improving agricultural income of beneficiaries despite the slow aggregate progress:**

- A range of investments in farmers and their inputs and investing all along the value chain

**We ask two questions:**

- Given the fiscal space and implementation difficulties can such investments be scaled up rapidly to the entire population?
- Are there specific components of these interventions that could be emphasized that could reach a large share of the population in the short run?

**We do not offer definitive guidance on the primary constraints or the best fixes**

- Other great work does a better job of identifying the broad range of constraints and potential fixes- see the PNG Economic Update for an example
- Results here ask questions about sequencing and timing of those already identified reforms that might offer the best chance at poverty reduction in the short term
- See extensive analysis by DAL, other WB teams, IFPRI, and others

# Agriculture in the National Statistical System

# Agriculture in the National Statistical System

## What is Typically Needed

- Agricultural census every 10 years
- Periodic sample surveys of agricultural producers on policy-relevant topics
- Updated national accounts to regularly estimate agricultural income
- Agricultural issues addressed in other household surveys (e.g., HIES, LFS, etc.)

## What PNG Has

- Agriculture addressed as part of the 1980 census- has not been updated in over 40 years
- Three household surveys with non-comparable labor modules between 2009 and 2022- some inexact comparisons can be made over time
- Outdated national accounts, particularly as it pertains to agriculture and the informal sector- agriculture GDP and share of employment is imprecisely estimated

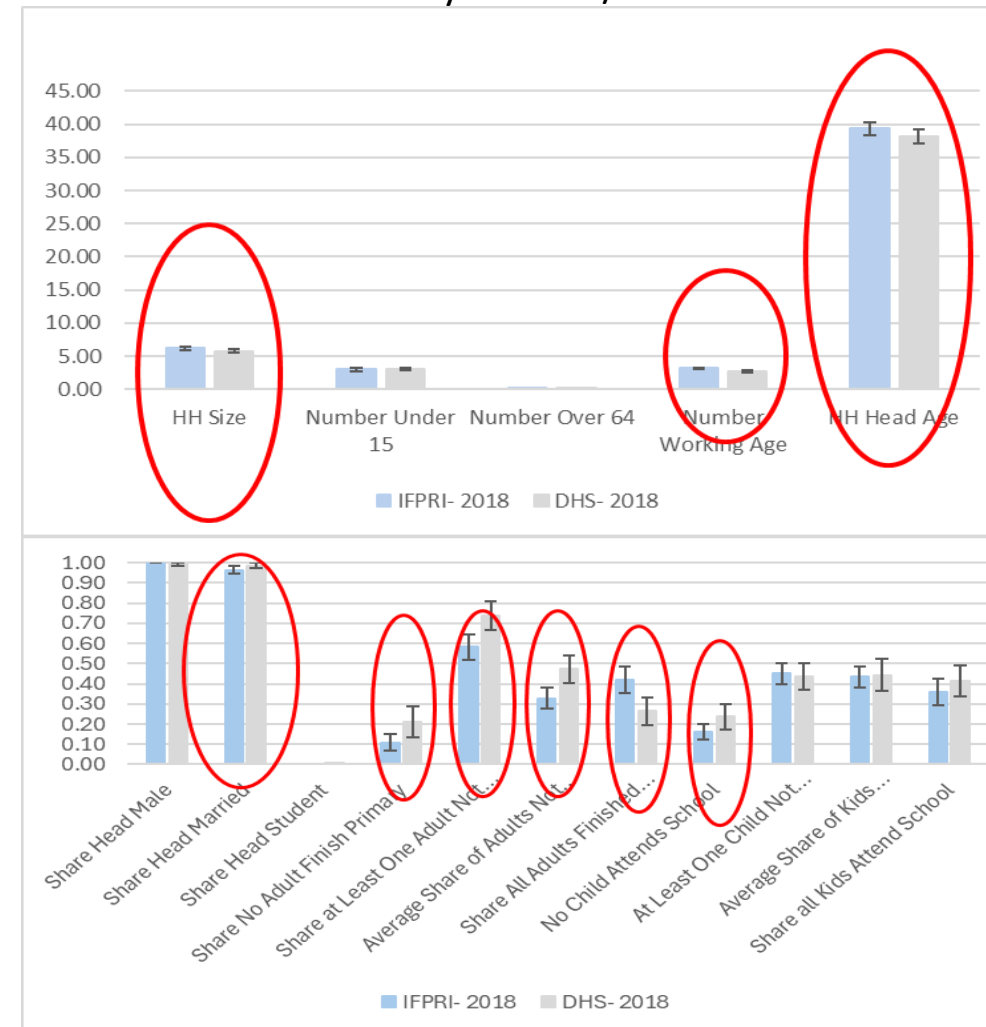


Significant holes in the NSS and statistical modernization across the statistical system is needed in the long run

# Given the agricultural coverage gaps in the NSS, much of the existing analysis has focused on alternative data sources

- **IFPRI has conducted two non-nationally representative household surveys**
  - Smaller survey in four provinces in 2018; larger survey across the country in 2023
  - Illustrate farming practices and employment of rural households in both rounds (e.g., Schmidt et al. 2018; Schmidt et al. 2024; etc.)
  - But difficult to understand how to interpret the findings—large differences in slow-to-change characteristics of the survey sample and the nationally representative surveys
  - Percentage difference large and persisted when restricting only to rural and agricultural households
- **IFPRI also used older agricultural fieldwork to illustrate the potential inefficiency of PNG agriculture**
  - Compare fieldwork in 2000 to yields in similar agroecological zones in Indonesia
  - Very large yield gaps between what was attainable by best agricultural practices
  - Between one-quarter and three-quarters of yields lost in PNG depending on the crop

Comparing Average Outcomes in 2018 IFPRI Survey to 2016/18 DHS



# But the Little Information that PNG has in the NSS is Underutilized

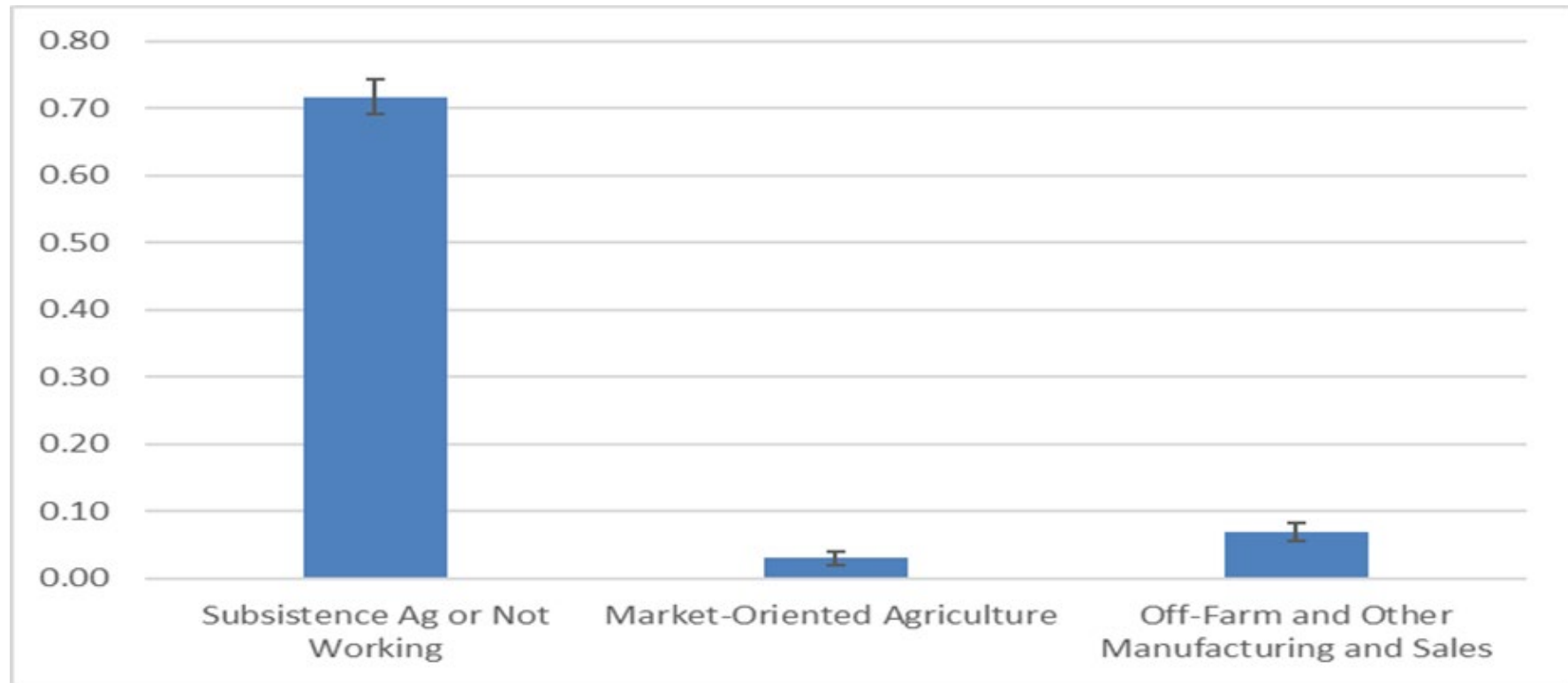
- **Very little information from household surveys after 2009 are used in describing the state of agriculture**
  - Little use of agricultural employment and change over time
  - No use of well-being estimates and their changes over time
  - No use of agricultural production information contained in some of the household surveys
- **Proposed to thoroughly utilize the NSS to:**
  - Provide a profile of agriculture using the most recent survey covering the entire agricultural sector
  - Simulate the poverty potential of agricultural development in the country
  - Illustrate the degree to which agricultural development might be happening in the country

# More Thoroughly Utilize the NSS to Describe Agriculture and the Sector's Potential

- **Snapshot of agriculture**
- **What is PNG's Agricultural Potential?**
- **How is PNG's Agriculture Sector Developing?**

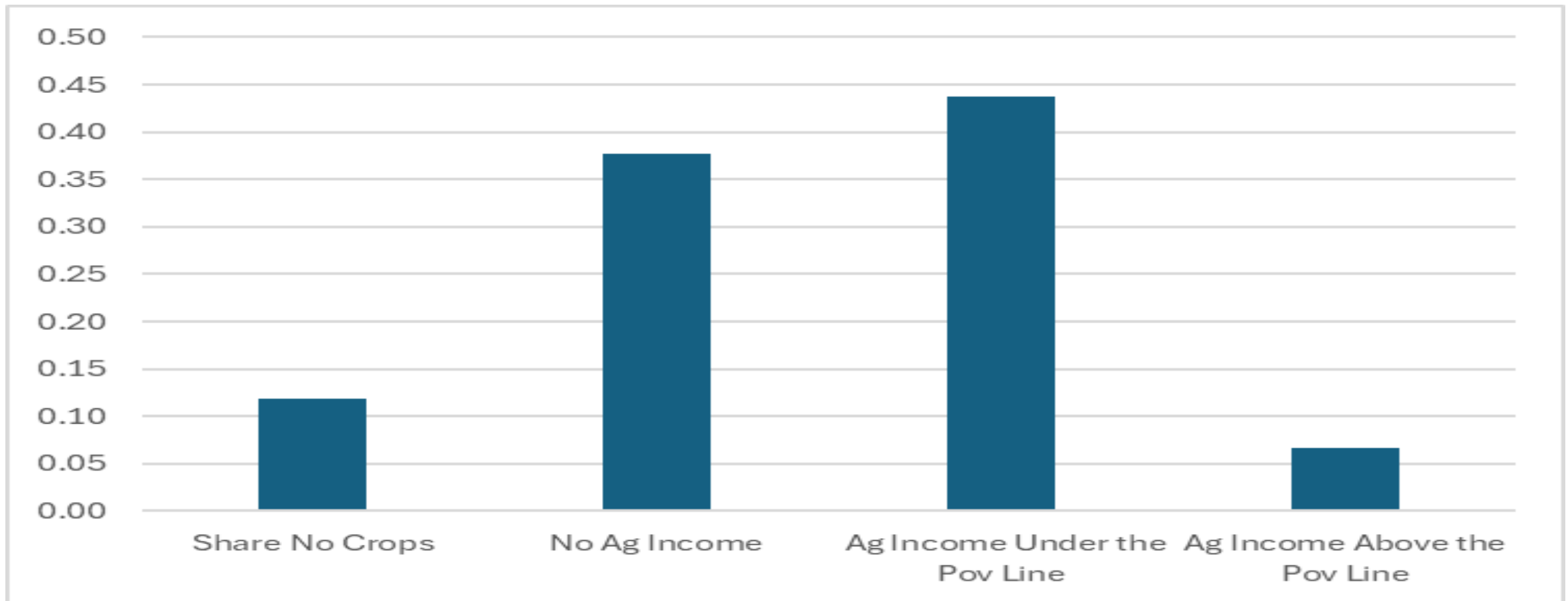
# The largest self-reported employment category is subsistence agriculture or not working in the past week

Share of the Population by Type of Ag Employ-  
2016/2018



# But nearly all households produce food for home consumption AND sell agricultural crops

Share of the Population by Agricultural Income-  
2016/2018



# What do households grow?

- **On average produce 9 crops for home consumption**
  - Two-thirds or more grow bananas, sweet potatoes, casava, and beans
  - Little regional variation in food crops
- **On average produce 2 crops for sale at the market**
  - Usually produce cash crops- coconuts, coffee, betelnut, and cocoa
  - Roughly 40 percent of the population grow each crop
  - The choice of cash crops varies significantly by region, with high in some and low in others
  - Lots of coffee produced only in the Highlands...Cocoa produced in Momase and the Islands...

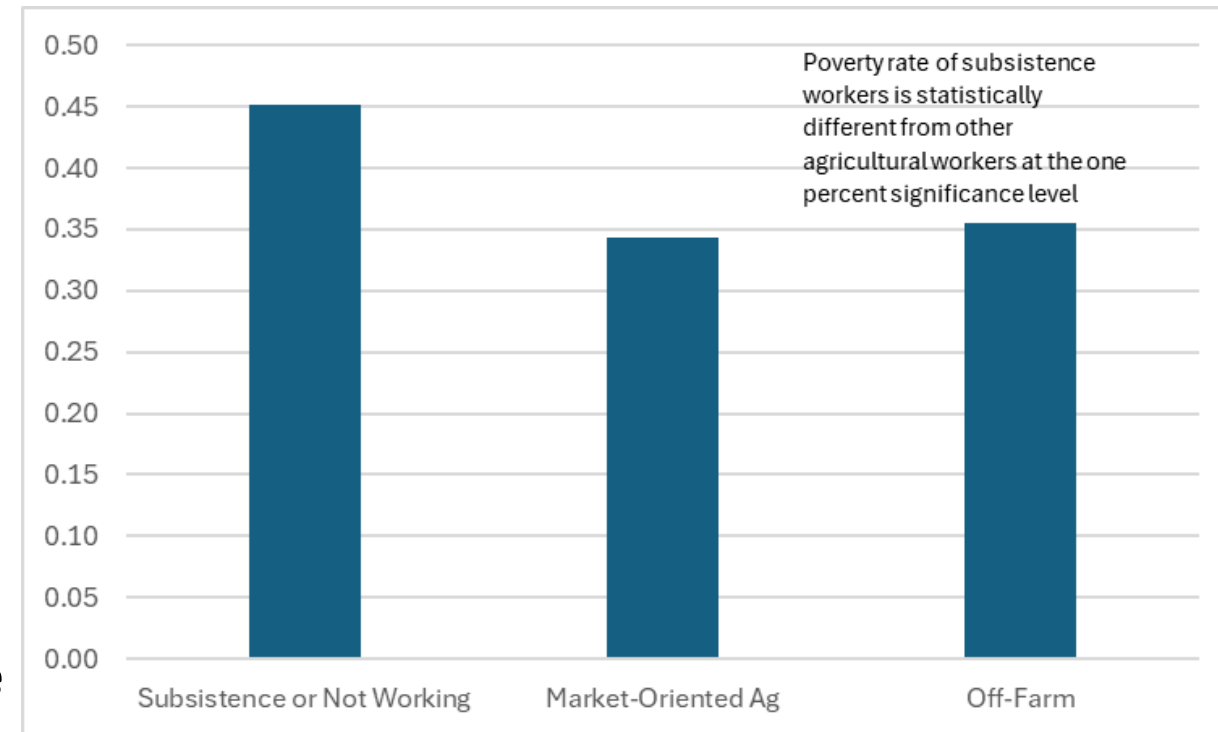
# More Thoroughly Utilize the NSS to Describe Agriculture and the Sector's Potential

- Snapshot of agriculture
- How much poverty reduction can be driven by agricultural growth?
- How is PNG's Agriculture Sector Developing?

# Agricultural workers in market-oriented agriculture or in off-farm activities have a significantly lower poverty rate

- **Poverty rate approximately 10 percentage points lower for both market-oriented agricultural and off-farm work**
  - Consistent with a large body of research across numerous settings (e.g., Barrett et al. 2017; etc.)
- **Policies that expand these sectors and make them more productive would likely have a strong poverty impact in the country**
  - Includes increasing the amount of crops that are sold in the market for primarily subsistence workers
- **Much of current government policies, World Bank lending, and other operations in the country are in line with these goals**

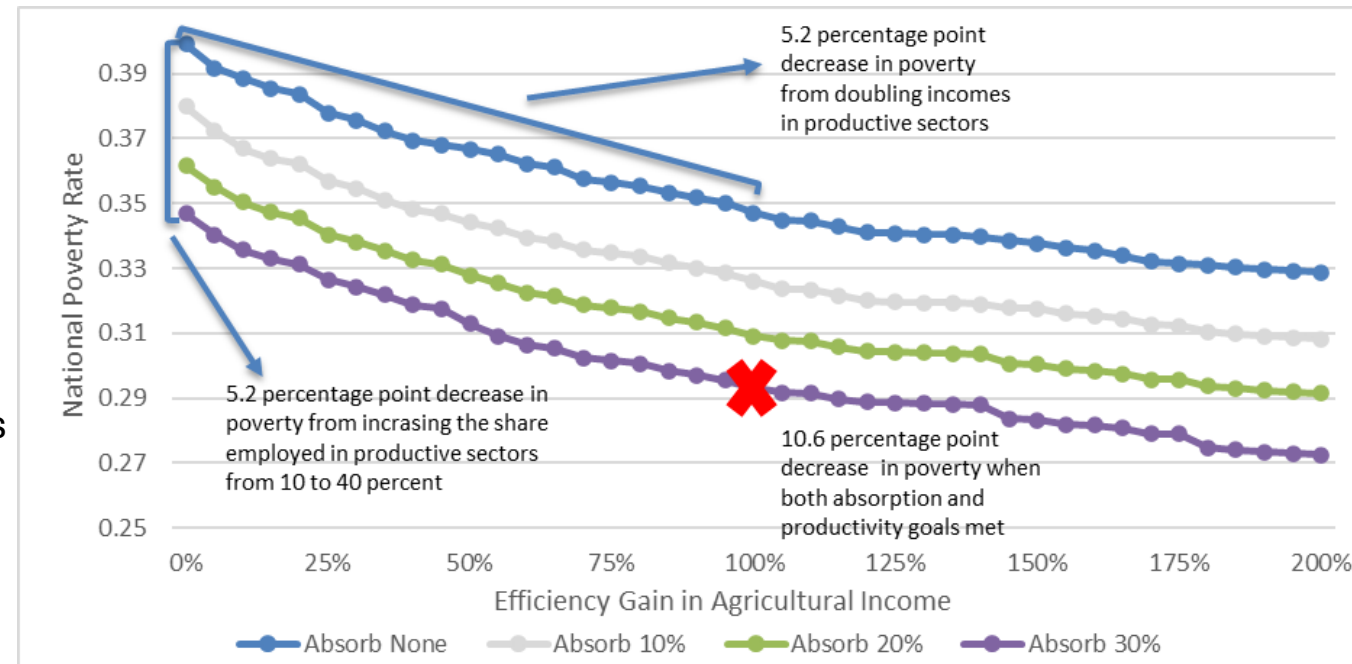
2009 Poverty Rate by Type of Agricultural Work



# In the long term, significant poverty reduction requires the absorption of subsistence workers AND substantial increases in productivity

- **Each curve illustrates the national poverty rate under increases in agricultural productivity**
  - Top curve under the assumption that none of subsistence labor absorbed in productive sectors
  - Each additional curve assumes an additional 10 percent absorbed
- **Both productivity growth and substantial absorption conditions needed to achieve ambitious poverty reduction goals**
  - Achieving only one of the two goals (either one) results in 5.2 percentage points of poverty reduction to 35 percentage points
  - But poverty falls by 10.6 percentage points to 29 percent when both goals met
- **Both goals needed to approach poverty rates of countries with similar economies and resource intensity**

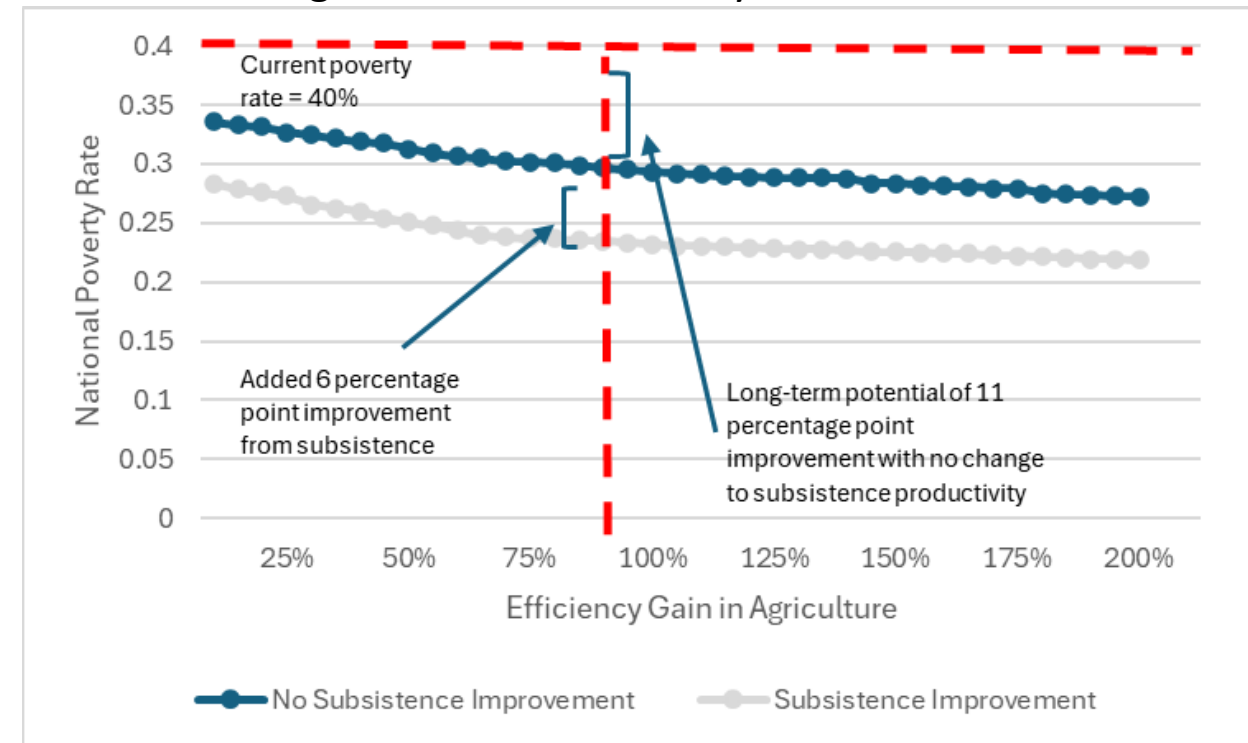
National Poverty Rate Under Different Agriculture Productivity Gains and Absorption of Subsistence Labor



# But ignoring the productivity of subsistence agriculture substantially limits the poverty reduction that is attainable in the long run

- **Poverty reduction can be substantially enhanced with improvement to subsistence ag**
  - Size of the sector is large even under wildly optimistic absorption scenarios
  - HHs with members employed in more productive sectors still grow crops for own-consumption
- **Poverty rate can nearly halve when also addressing subsistence productivity**
  - Poverty rate reduces from 40 to 23 percent
  - One-third of the reduction attributable to subsistence
- **Additional poverty reduction evident despite the conservative assumptions about subsistence ag**
  - Poverty reduction attributable to subsistence would be higher if less labor absorbed in more productive sectors
  - Productivity gain to subsistence ag is half of that modelled for other agricultural sectors

National Poverty Rate Under Different Agriculture Productivity Gains

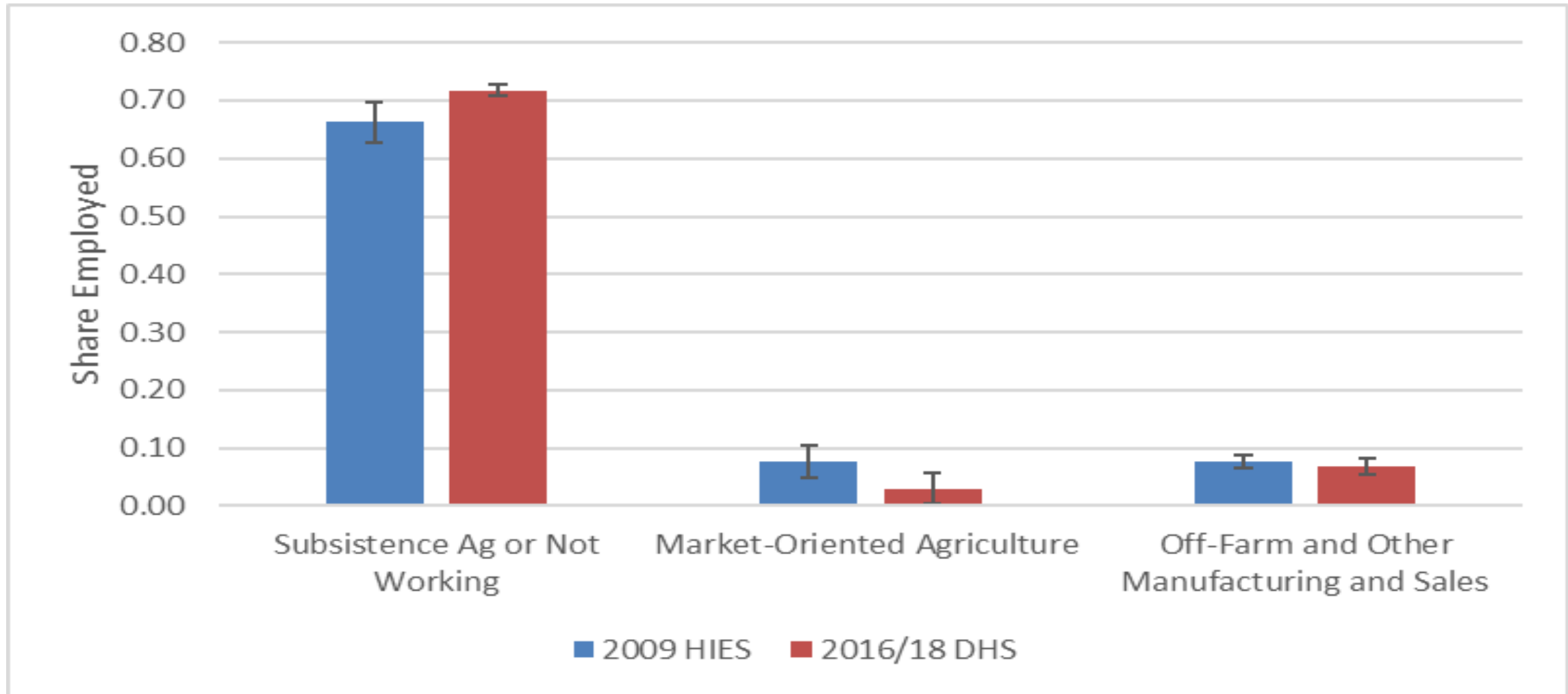


# More Thoroughly Utilize the NSS to Describe Agriculture and the Sector's Potential

- **Snapshot of agriculture**
- **How much poverty reduction can be driven by agricultural growth?**
- **How is PNG's Agriculture Sector Developing?**

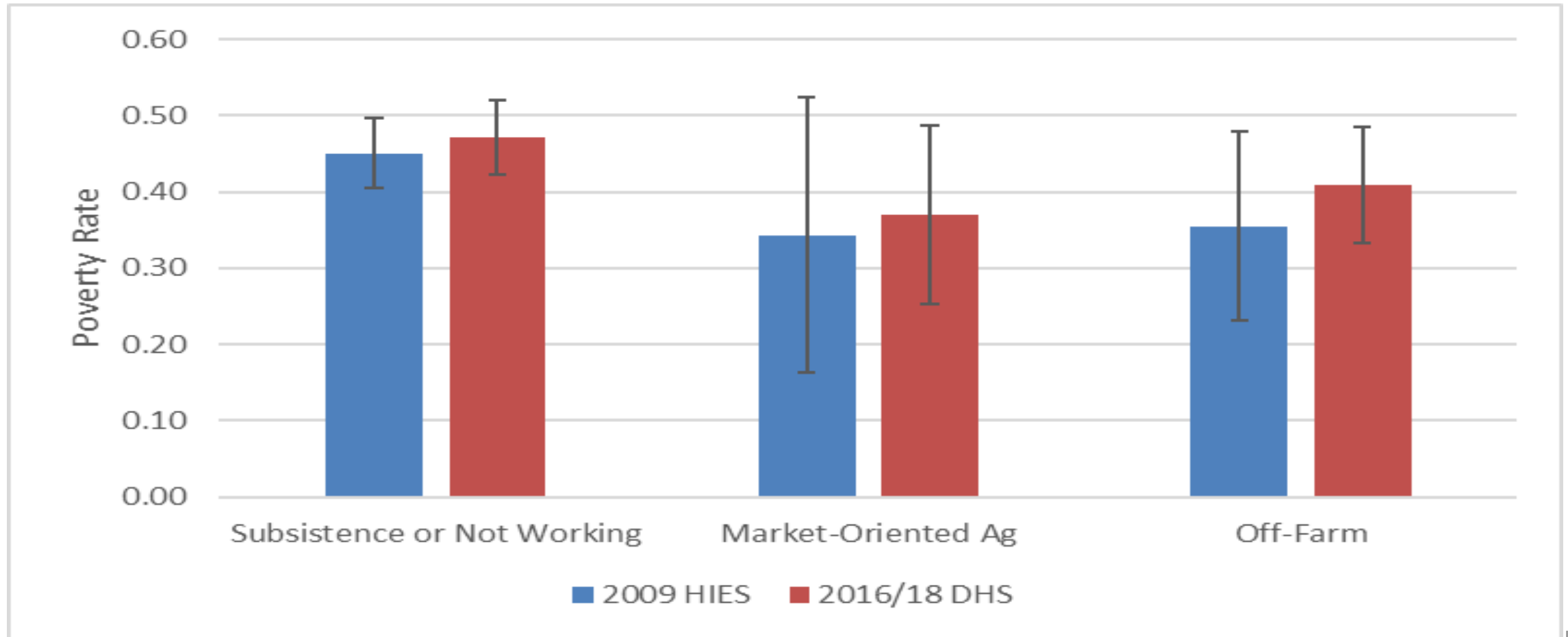
# Neither market-oriented agriculture nor off-farm employment increased between 2009 and 2018

Share of the Population in On-Farm and Off-Farm Employment



# Best evidence suggests that agricultural income increased little in all subsectors between 2009 and 2018

Poverty Rate by Subsector



# What is the implication of stagnation in well-being by subsector?

- **Measuring agricultural productivity has been very difficult given substantial data constraints**
  - Indirect methods using 25-year-old production data suggest that agricultural productivity is low
  - Yields between one-quarter and one-half of what has been achieved by production in similar regions of Indonesia for many important crops (e.g., Benny et al. 2022)
- **Household-level well-being estimates allow a novel method to identify changes in productivity**
  - If a portion of productivity growth goes to either labor or landowners, we might expect to see poverty rates decline in those subsectors where productivity is increasing the most
- **Well-being of agricultural households did not improve**
  - As measured by monetary poverty and by multidimensional poverty
  - Estimates for all sub-sectors are indistinguishable between 2009 and 2016/18
- **Evidence further consistent with other sources of data**
  - Little change in poverty or access to services at the national level
  - Well-being levels are most comparable to countries with much less economic activity and at earlier stages of development

# Very little difference in the employment and poverty trends across the different agricultural regions of the country

- **Given data constraints, it's very difficult to fully disaggregate the poverty and employment trends across the five regions**

- Too few people employed in market-oriented and off-farm agricultural sectors at the regional level to detect any differences in the well-being levels amongst each subset
- But we can report:
  - Changes in employment in each subsector at the regional level
  - Changes in multidimensional and monetary poverty rates amongst subsistence agriculture

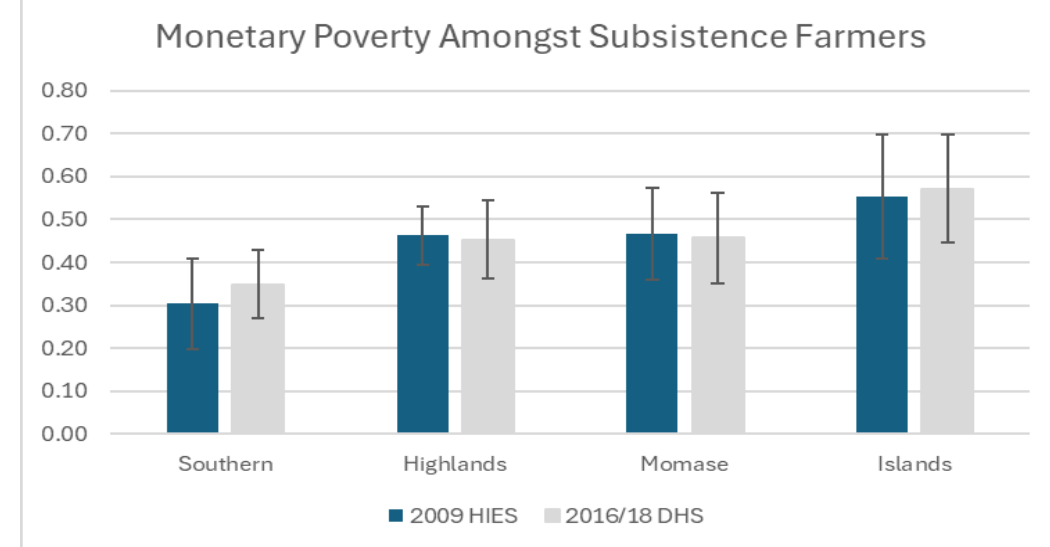
- **All national trends in agricultural employment and well-being amongst workers very similar across all regions**

- No change in well-being amongst subsistence agricultural workers
- Some evidence of small increases in employment in subsistence agriculture (Highlands)
- Some evidence of small decreases in employment in market-oriented agriculture (Islands) and off-farm agricultural employment (Highlands)

- **Stagnation in agricultural development is very similar across the entire country**

	Subsistence	Market	Off Farm
Southern Region	=	=	=
Highlands Region	+	=	-
Momase Region	=	=	=
Islands Region	=	-	=

Notes: Table reports the sign of estimates of changes in the share of the population employed in each sector of agriculture at the region level between 2009 and 2016/18. + denotes an increase that is statistically significant at the 5 percent level; - denotes a decline that is statistically significant at the 5 percent level; and = denotes a change that is not statistically significant at the 5 percent level.



# Agricultural development is falling far short of the improvements necessary to substantially reduce poverty

- **Simulations assumed much larger absorption of subsistence workers and increases in income than observed in survey data**
  - Assumed an increase from 10 percent to 40 percent working primarily in commercial agriculture
  - Assumed a doubling of income in commercial and off-farm agriculture
  - Assumed a 50 percent increase in income from subsistence farming
- **A range of good work has been identifying issues preventing faster progress in the sector- see the World Bank PNG Economic Update for an example**
  - Structural barriers – poor connectivity, foreign exchange controls, land tenure issues, etc.
  - Underfunding of public support systems- limited investments in extension research, etc.
  - Inefficiencies in downstream value chains- lack of private sector investment, difficult enabling environment for the private sector
- **These estimates illustrate the strength of those constraints limiting agricultural development**
  - Results also illustrate one of the reasons that there hasn't been faster poverty reduction over the same time period

# Questions About Addressing Issues Constraining Agricultural Development

# There is very good work being done that identifies key reforms and issues to better boost agricultural development and incomes

- **See the World Bank PNG Economic Update for a recent example:**
  - Suggests many reforms and investments that will improve agricultural income and create jobs
  - Includes scaling up reform packages that have been shown to boost incomes, investing in value chains, and boosting private sector investment
- **We take this as a departure point to ask some questions about the timing and emphasis of these reforms to ensure poverty impacts over all time horizons**
- **Are there components of the proposed reforms and investments that might have a larger impact in the short run than others?**

# Examples of important reforms and investments that are unlikely to have a large immediate impact

- **Structural barriers preventing the private sector more generally are likely also hampering agricultural development**
  - Lack of connectivity and road access to transport crops to markets
  - Lack of private sector investments in downstream industries (e.g., processing, etc.)
- **Many of the government policies and investments are trying to address these general issues that will also help agriculture:**
  - Kina convertibility
  - Infrastructure development
- **These reforms and investments will take time to address and cannot be rapidly addressed**

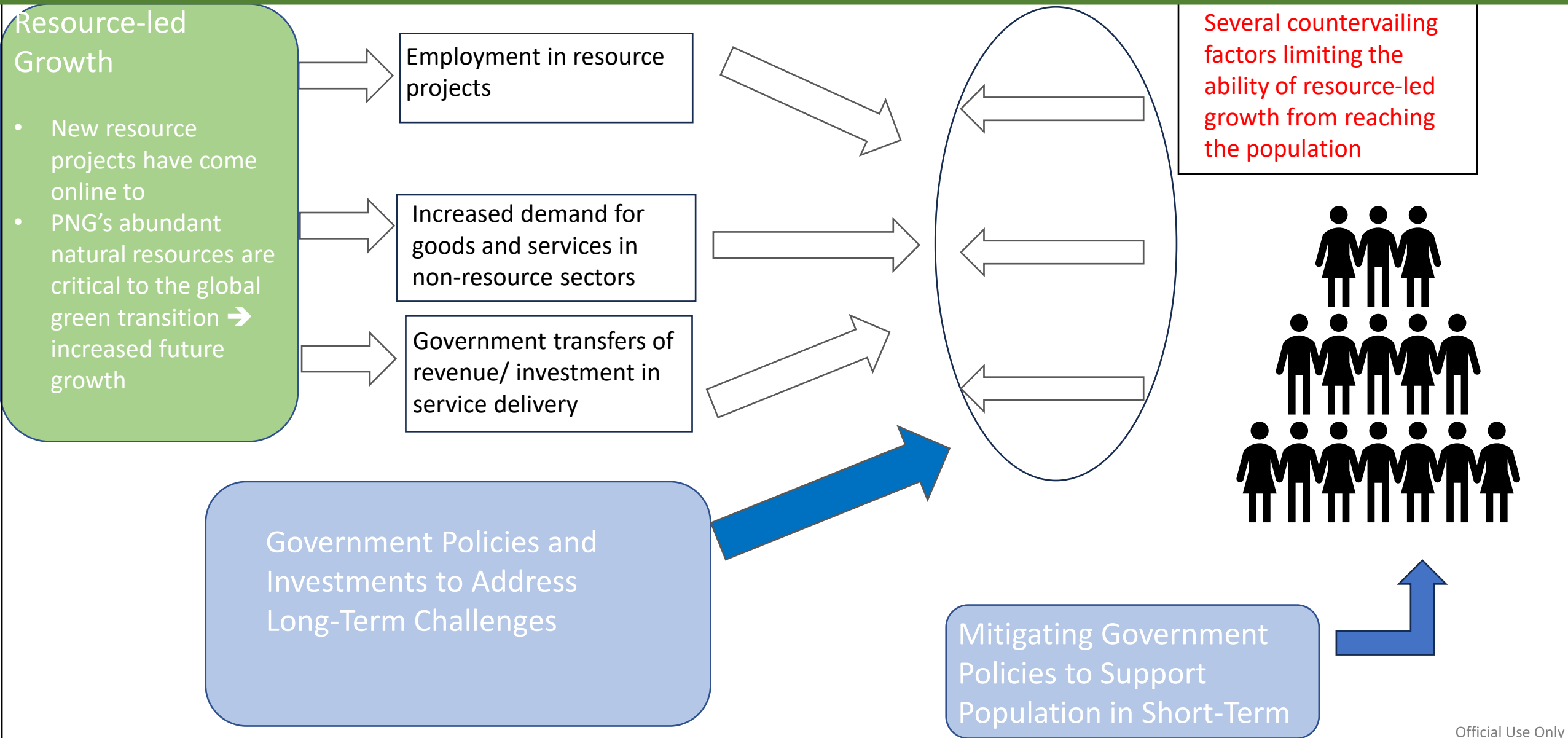
# Examples of important reforms and investments that are unlikely to have a large immediate impact, cont.

- **Project data illustrate benefits from a range of investments in farmers and value chains for specific crops**
  - Range of investments for farmers- better inputs, improved practices, etc.
  - Range of investments to better develop the entire value chain for specific crops- improved equipment to process crops, building of roads, etc.
- **Income of farmers receiving benefits have income increases in line with the doubling of income assumed in the poverty projections**
  - See the World Bank PNG Economic Update
- **Expanding these investments are important to accelerating agricultural development**
- **But can all of these investments be scaled up so quickly to benefit the entire population in the next 5 years? Next 10?**
  - Difficult fiscal and operating environment

# Are there components of the investment packages that can benefit more beneficiaries at once and have a larger short-run impact?

- **Experimenting with expansions of extension research and outreach alone could be important to short-run poverty reduction**
  - All available (non-traditional) evidence shows no extension activity and that agricultural practices are learned informally
  - Project data show that these investments when coupled with high-quality inputs work well
  - International evidence illustrate high potential returns from small investments from a low base of extension activity
- **The outputs of extension research are a non-rivalrous good that can reach a larger population than scarce private goods**
  - Can be devoted to both food and cash crops
  - Important to boost both home consumption and income from commercial agriculture
- **Can compare outcomes of beneficiaries receiving full package of investments to those receiving just extension services**

# Example of a more general principle we are emphasizing in the poverty assessment



# Concluding Messages

- **The agricultural information in the national statistical system needs to be better utilized AND more investments need to be made to improve the data coverage of the very important sector**
  - These analyses and recommendations are just the start of what we might be able to do
  - More completely measuring the entire agricultural sector will result in more precise measurement of productivity, its changes, and the potential
- **The long-run strategy of the government to boost employment and productivity in commercial agriculture and off-farm employment are good...**
  - Countervailing factors are making progress very slow
  - There is a huge benefit from also emphasizing an all-of-agriculture approach and further improving productivity of home production
- **Questions remain about how best to sequence and time reforms to make sure that there is an impact in the short and long term**
  - There are proven investment packages that can be scaled up to other crops and other regions
  - Mixing extension with different forms of outreach, different mixes of inputs, etc. have been demonstrated to improve productivity in similar settings
  - More experimental work is needed to fully understand what mix of support can help a large share of the population in the short run