GLOBAL FOOD POLICY REPORT IFPRI 2022 | CLIMATE CHANGE & FOOD SYSTEMS

Part II

Agricultural Support for Sustainable Food Systems under Climate Change: Implications for Malawi

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Agricultural Support for Sustainable Food Systems under Climate Change

1. Chapter 2: Repurposing Agricultural Support: Creating Food Systems Incentives to Address Climate Change
2. Chapter 4: Agricultural Research and Innovation for the Future: Investments for Efficiency, Sustainability, and Equity
3. Relevance and Implications for Malawi

1. Repurposing Agricultural Support

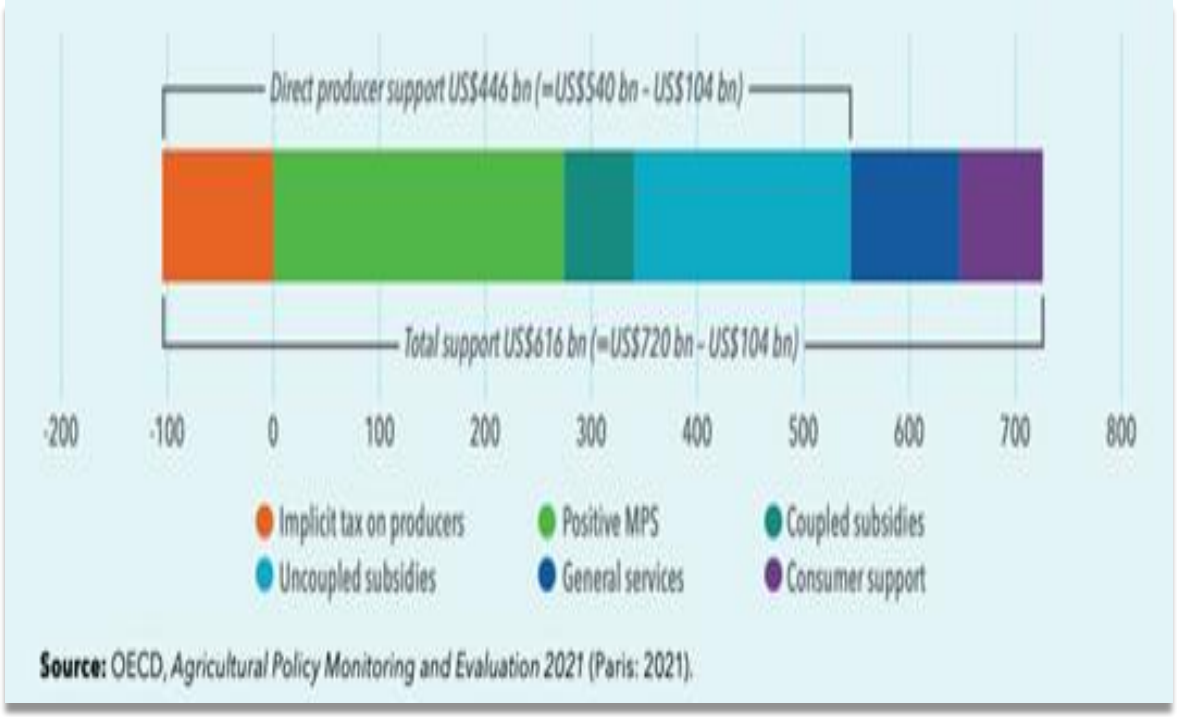
Creating Food Systems Incentives to Address Climate Change

- Agricultural support policies provide enormous transfers of resources to farmers and enjoy strong political support in both developed and developing countries.
  - Agricultural support policies, such as input subsidies boost global food production, particularly of staple crops, thereby reducing hunger and poverty.
  - Yet, there are serious concerns about their impacts on achieving sustainable, healthy, and inclusive food systems.

CURRENT AGRICULTURAL SUPPORT AND IMPLICATIONS (1)

- Currently (globally), agricultural support goes largely to producers, primarily in forms that affect market prices and distort incentives for producers and consumers
- Efficiency in delivering benefits to farmers is low, only 35%.
- Climate change implications
  - Support to production or input use increases output leading to increased GHG emissions
  - Support through trade barriers reduces GHG emissions by reducing output demand

Agricultural producer support by main types of support 2018–2020 (billions of US$ per year)



CURRENT AGRICULTURAL SUPPORT AND IMPLICATIONS (2)

Effects on food security, nutrition and equity

- The strong focus on promoting staple crops has improved access to basic calories but has not done much to improve dietary diversity.
- Impacts are often regressive — benefiting wealthier commercial farmers, while denying poorer farmers access to markets.
- Support through trade protection, raises the cost of food and harm poor consumers.

Reform options and implications (1)

- **Reform options**
  1. Abolition of all support (both subsidies and border support)
  2. Target support to CO_2 efficient crops
  3. Repurposing for sustainable innovation and rural livelihoods

1. Simply abolishing all support would involve trade-offs between environmental, economic, social objectives.
   - Slightly reduces global output and GHG emissions from agriculture
   - Lowers farm output and raises the cost of healthy diets
   - Virtually no effect on poverty

- BUT impacts differ substantially between developed and developing countries:
  - Drop in farm income per worker 4x larger in developed countries
  - Farm employment decline in developed, but increases in developing countries, as higher world prices induce supply
  - BUT poverty increases in developing countries due to the higher prices (food price dilemma!)
  - GHG emissions drop by over 6% in developed countries, but worldwide they would fall by only 1.5% as agricultural production shifts to developing countries.

REFORM OPTIONS AND IMPLICATIONS (2)

2. Targeting only CO_2 efficient crops does not hold the best outcomes

3. Repurpose subsidies in ways that would make progress toward achieving global climate and food security goals.

- Investing an additional 1% of Agricultural GDP in R&D could achieve greater gains with fewer trade-offs than simply eliminating subsidies.
  - BUT that would require
    - Shifting resources from market-distorting subsidies to spending on R&D that increase productivity and reduce emissions; and
    - Support/create incentives for farmers to adopt those productivity enhancing technologies.

Global implications of repurposing domestic support

Source: M. Gautam, D. Laborde, A. Mamun, W. Martin, V. Piñeiro, and R. Vos, *Repurposing Agricultural Policies and Support: Options to Transform Agriculture and Food Systems for Better Health of People, Economies and the Planet*, Technical Report (Washington, DC: World Bank and IFPRI, 2022).

Note: Green bars indicate movement toward societal goals; orange/red bars indicate movement away from societal goals.

Reform options and implications (3)

- Inefficient targeting also imply that resources may have high opportunity costs, and potentially harmful environmental impacts
- So, redirecting/ “repurposing” agricultural subsidies to investments that support increased production and greater sustainability, such as agricultural R&D and infrastructure have the potential for win-win-win for people, planet, and prosperity.
- Given the current domestic popularity of support policies, even the best reform agenda can face considerable political hurdles – political economy issues.

2. Agricultural RESEARCH FOR THE FUTURE

Investments for Efficiency, Sustainability, and Equity

- Agricultural Research and Innovation are critical in two main ways
  - To increase agricultural productivity in the face of climate change
  - To transform global Agri-Food Systems (AFS) through improved efficiency and resilience in achieving social, economic, nutritional, and environmental goals.
- GFPR analysis reviews
  - Patterns of research investment for AFS over the past half century
  - How research and innovation need to evolve to address climate change and the host of challenges facing food systems
- Along with reproposing of agricultural support, this is a critical issue for Malawi

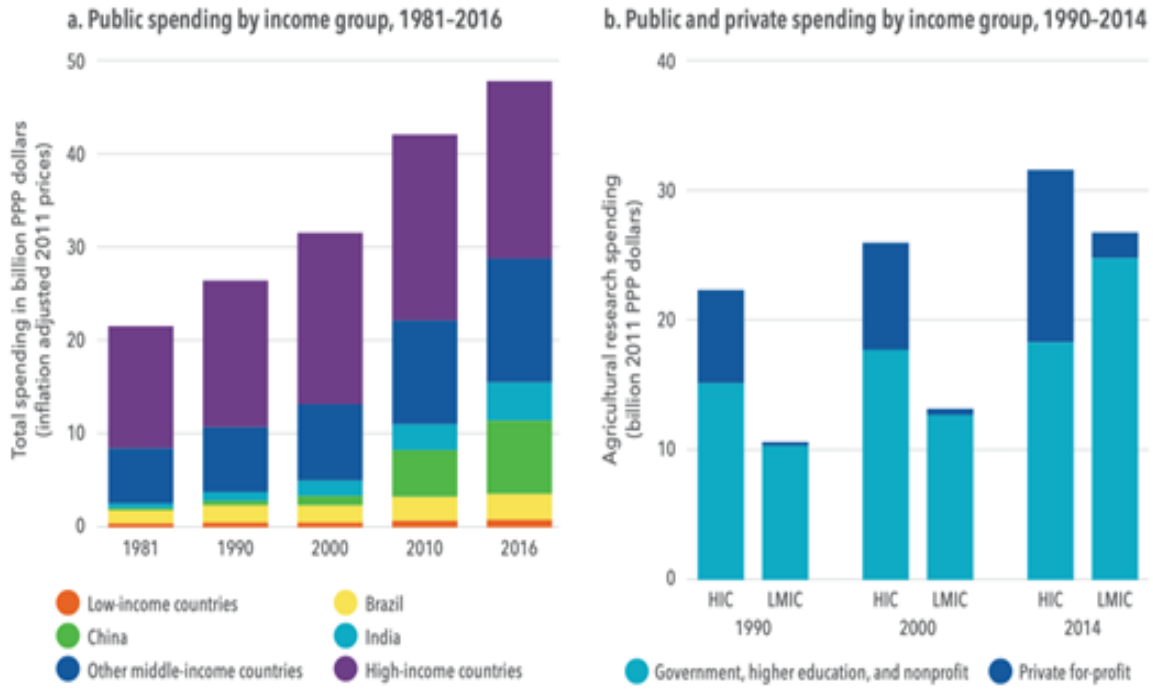
THE CHANGING AGRICULTURAL RESEARCH ENVIRONMENT

- Over the past 50 years, LMICs have benefited from considerable improvements in agricultural productivity, with positive impacts on poverty reduction and nutrition.

- Global public agricultural research investment doubled 1981-2016
  - Investments by larger MICs expanded substantially in recent decades
  - BUT investments in smaller LMICs, are still too small to address future impacts of climate change across food systems.

- The size of private sector remains relatively small in LMICs, BUT some commodities in MICs private R&D are relevant for LMICs.

Long-term trends in agricultural research spending



Source: Public sector data compiled from ASTI (https://www.asti.cgiar.org/data); private sector data from K. Fuglie, The Growing Role of the Private Sector in Agricultural Research and Development World-Wide," *Global Food Security* 10 (2016): 29-38.

Note: Income group classifications are based on the situation in 2019. HIC = high-income countries; LMIC = low- and middle-income countries.

PRODUCTIVITY GROWTH REMAINS A PRIORITY

- Agricultural productivity growth will remain a priority to meet development goals and address climate change.

- Productivity led-growth has been increasingly important in LMICs, but SSA output growth is still largely resource-led
- To meet global food demand, agricultural productivity needs to growth at a faster rate (1.28 % per year, currently only 0.96% in SSA)
- Productivity must be boosted through yield increases, more efficient use of scarce resources, and a reduction in crop losses, rather than greater use of natural resources.

Drivers of past Agricultural Growth

Source: USDA-ERS, accessed 2021.

NEED FOR GREATER AND BETTER TARGETED INVESTMENTS

- Greater Agricultural R&D Investment is needed in LMICS
  - At the Global level, $1 invested in R&D gives $10 in stream of benefits later
  - Significant investment gap in LMICs - just 50 percent of attainable investment levels in 2016
  - Underinvestment is prevalent in countries with small and medium-size research systems
  - Closing the LMIC investment gap will require sustained investment growth in large countries and accelerated growth in other countries with large research systems
    - Continued reliance on public domestic and international agricultural research
    - With greater cooperation and coordination, countries with lagging research systems also benefit.
- R&D must also target sustainability and resilience
  - Currently only 7% of R&D investments in LMICs targets sustainable intensification
  - Research and innovation need to focus on healthier and more sustainable diets
  - Invest in technologies that reduce emissions and increase smallholder resilience to climate change

INNOVATION IN AGRICULTURAL R&D AND DOWNSTREAM VCS

- Innovation in Agricultural Technologies is crucial

  Adaptation

  - Promising agricultural technologies such as precision agriculture, biofertilizers, and genome editing accelerate productivity growth without adding to pressures on natural resources
  - New breeding techniques that can help crops and animals be more tolerant of heat stress and pests.

  Mitigation

  - The technologies and practices currently available are insufficient to mitigate global warming.
  - Land-based mitigation technologies (reforestation, intercropping, etc.) coupled with reduction in non-CO2 gas emissions like methane, play an important role
  - Food waste and loss, which generate 8 to 10 percent of global GHG emissions, must be addressed.

- More focus is needed on downstream value chains
  - Implications of climate change for downstream components of food systems largely unexplored.
  - R&D investment for downstream technologies will need higher profile under climate change and development of food systems – increase efficiency, profitability while dealing with the environment

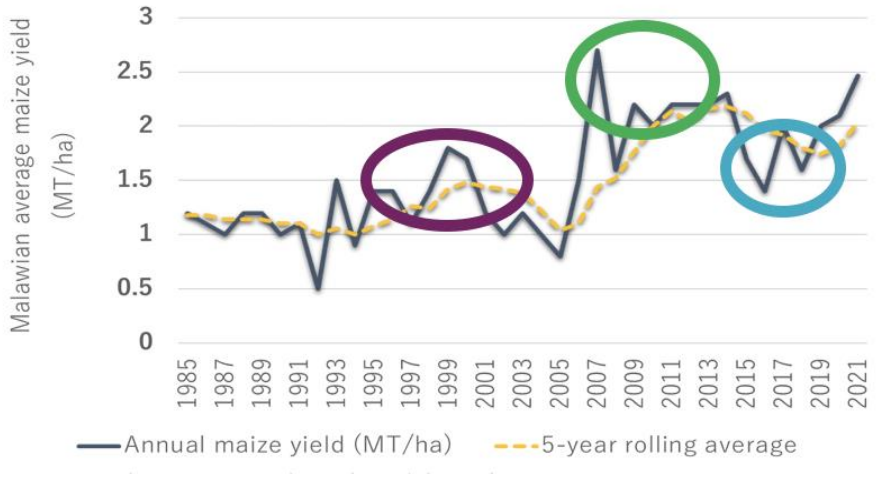
3. Relevance and implications for Malawi

- Why is this study relevant for Malawi?
  - Significant part of the agricultural budget in Malawi directed to the Affordable Inputs Program (AIP)
  - While some stated objectives are achieved in the short run, challenges remain for long term sustainability
  - There is an opportunity to reform and "Repurpose Agricultural Subsidies" for better sustainable development results including addressing climate change

AIP MOTIVATION, ACHIEVEMENTS AND CHALLENGES

- The Malawi AIP aims to address low productivity, slow growth, food insecurity and malnutrition, and poverty
- Average household maize yields increased over 60% from 1995-2004 (1.3 MT/ha) to 2005-2014 (2.1MT/ha), though still volatile to external shocks [graph]
- Given relative improvements in output growth, food security and nutrition, subsidy programs have been maintained with varying designs and coverage.
- Key challenges
  - Many households produce less than they need and are hurt by high food prices.
  - Unsustainable and inefficient subsidy allocations
  - Declining yield response to fertilizer and falling soil fertility
  - Ineffective targeting of beneficiaries

Maize yield in Malawi, 1985-2021



Source: Source: APES and FAOStat, by MwAPATA Institute.

Malawian households by maize production (%)

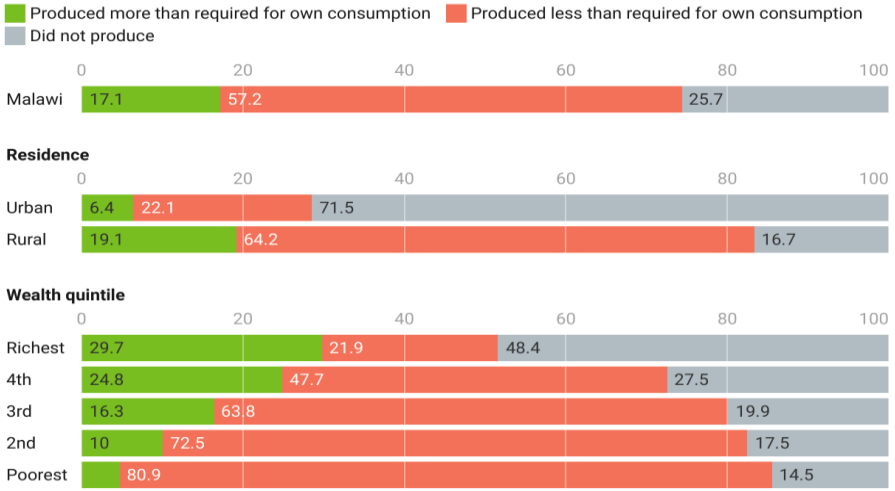


Chart: Jan Duchoslav • Source: Fifth Integrated Household Survey 2019-2020 • Created with Datawrapper

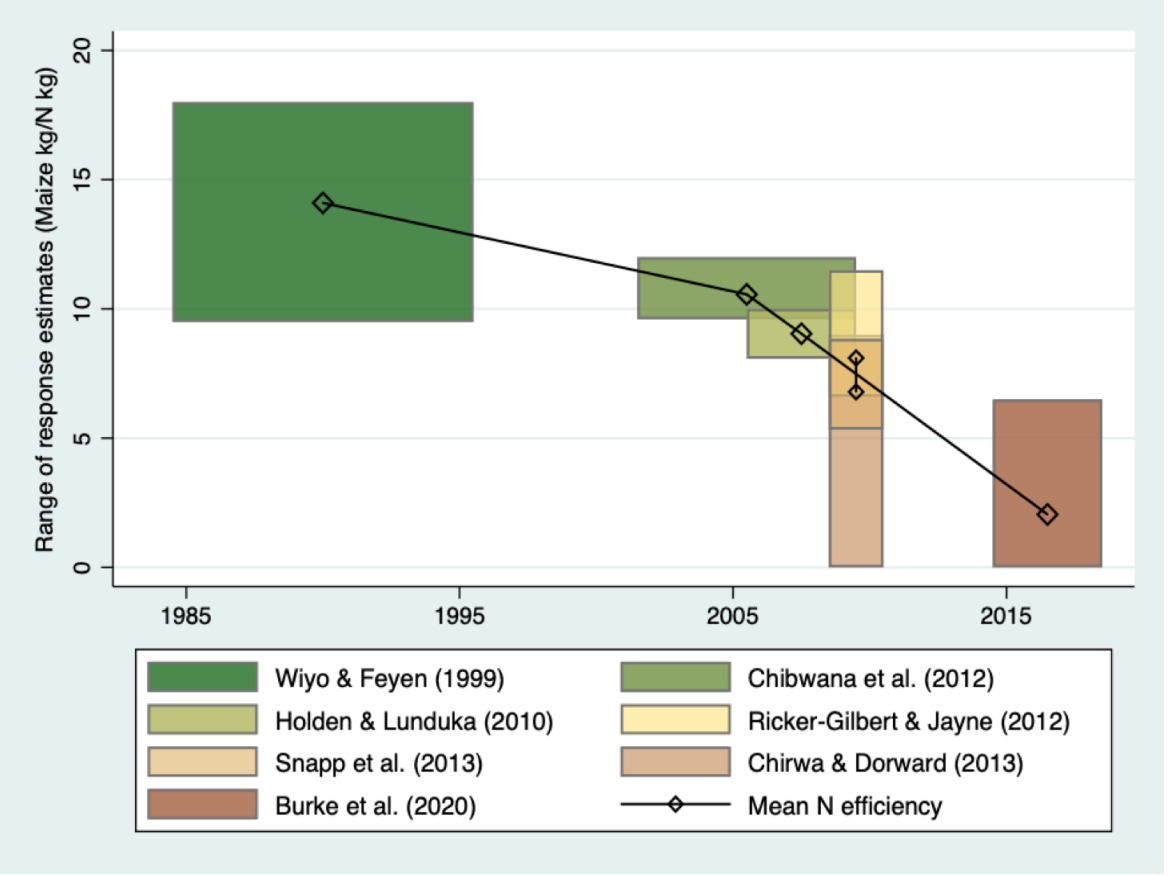
DEAL WITH UNSUSTAINABLE AND INEFFICIENT SUBSIDY ALLOCATIONS

- AIP Subsidy levels and allocations averaging roughly over 60% of MoA budget
- Substantial costs of operation for delivery
- Two crowding-out effects
  - AIP crowds-out other important agricultural investments, such as R&D, Extension, irrigation, Livestock.
  - AIP crowds-out supplies from commercial input markets [15 – 20% displacement]
- Current focus on maize limits crop diversification and the maximization of goals related to income and dietary diversity.

Address the decline in yield response to fertilizers

- There has been declining soil fertility and yield response to fertilizer [graph]
  - Sustained yield response only with good rains and adequate agricultural practices
- This calls for investments in irrigation, R&D (soil quality and genetic innovations), and extension.

Maize yield response to Nitrogen fertilizer in Malawi

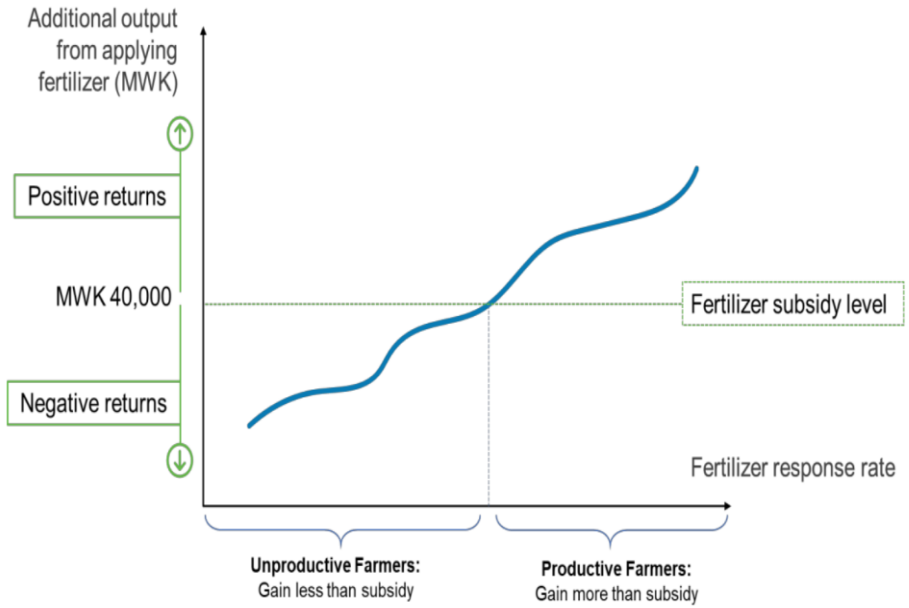


Source: MwAPATA Institute.

TARGETING OF BENEFICIARIES CAN BE IMPROVED

- Current targeting aimed at food security and poverty results in poor targeting
- Current ineffective targeting
  - Reduces the cost-effectiveness of AIP
    - Limited returns to resource poor farmers [graph]

Economic Returns to fertilizers, by farmer type



Source: De Weerdt and Duchoslav.

- Effective targeting strategy
  - Target primarily productive farmers
  - Reach resource poor (less productive) farmers through social protection (cash transfers)
  - Operationalize self-targeting mechanisms: Choice between higher amount in AIP Input vouchers vs. lower amount in cash.

CONCLUSION

- Malawi can repurpose its agricultural support to maximize development objectives
  - The agricultural budget needs to be “rightsized” to balance the resources allocated to the AIP with complementary investments in R&D, extension and irrigation to address productivity, efficiency and environmental sustainability.
- Agricultural support programs such as AIP need to ensure production diversity (beyond maize) to support income growth and dietary diversity.
- Policies, investments that advocate for a progressive AIP are in the right direction
  - These should improve targeting mechanisms based on incentives
  - Support resource poor farmers through transitory social protections measures
- Lastly, the country needs to continue to invest in infrastructure, services, and a regulatory that support the development of sustainable value chains.

Zikomo kwambiri!