



CLIMATE-SMART AGRICULTURE

Is crop diversification a panacea for climate resilience in Africa?

Welfare implications for heterogeneous households

Crop diversification is often promoted as a strategy to achieve climate resilience. However, the benefits of crop diversification may vary depending on household resource endowments. For farm households with few resources, crop diversification is likely to be an important strategy for managing production and price risk. However, for larger, better capitalized farms, diversification may not be welfare enhancing, because returns to specialization may be higher for these households.

Should these observations be correct, it is important to identify appropriate policies and strategies for different household groups, in order to achieve development objectives in the context of climate change. While the majority of farmers in sub-Saharan Africa (SSA) are small and face considerable resource and market participation constraints, there is a non-trivial and rapidly growing population of relatively larger (5-20 ha), better capitalized African farmers. In this sense, SSA is a particularly interesting case of study.

Data from Zambia, Burkina Faso and Malawi are used to examine the relationship between land size, crop diversification and welfare in the context of climate change.

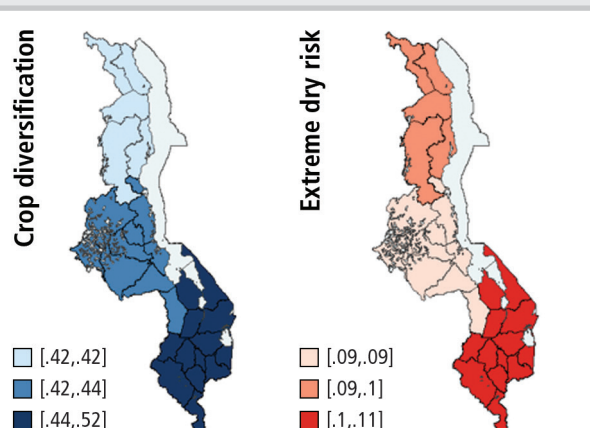
Crop diversification is an effective strategy to deal with climate variability

Crop diversification refers to *the addition of new crops or cropping systems to agricultural production on a farm*. By diversifying, farmers increase the range of potential food and income sources available to them. In many drought-prone regions of SSA, crop diversification serves as an important climate risk management strategy. Figure 1 shows graphically that in Malawi, for example, the highest levels of crop diversification are observed in the southern part of the country where the risk of droughts are the highest.

KEY MESSAGES

- ▶ Poor households can reap significant benefits from adopting crop diversification strategies, on the other hand, diversification may not be particularly beneficial for wealthier households, where returns to specialization are high.
- ▶ However, very-poor households tend to diversify less because they face many barriers, of which market availability is a significant one.
- ▶ Policymakers can increase the effectiveness of interventions promoting crop diversification by targeting low income farmers located in harsh climate areas by improving information, extension services and market access infrastructure.

FIGURE 1.
Crop diversification is higher in drought-risk areas



Source: FAO, Economic and Policy Analysis of Climate Change (EPIC) team.

Poor farmers benefit more from crop diversification

The economic returns to crop diversification tend to be highest for the poorest farmers. As household income increases, the economic benefits of diversification decline. This pattern is consistent across three analysed countries: Burkina Faso, Malawi and Zambia (see Figure 2).

In some cases, for instance in Zambia, crop diversification may even become financially harmful for high-income farmers, relative to more specialized farming systems.

Overcoming barriers to crop diversification is critical

Despite the socio-economic and climate-resilience benefits of crop diversification for low-income farmers, the evidence suggests that these farmers are the least likely to diversify. The relationship between crop diversification and wealth (proxied by land size) for Burkina Faso, Malawi and Zambia is found to portray an inverted-U form; that is to say, the poorest and the richest farmers diversify less than farmers of medium wealth.

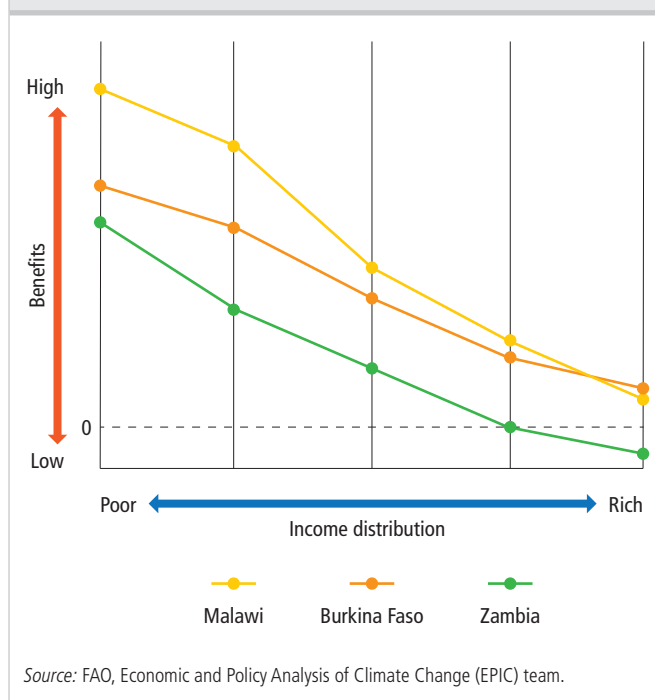
The most commonly observed barriers to crop diversification include: limited output and input market development, and insufficient extension support for non-staple food crops. In addition, poor households often perceive high levels of risk associated with diverting scarce land away from staple food production. Unfortunately, staple food crops such as maize are more susceptible to expected changes in temperature and water availability, thus reliance on these crops increases the climate vulnerability of poor, non-diversified farm households.

Policy recommendations

This evidence suggests that to maximize the benefits of crop diversification, policies should aim to promote diversification among low income households, without limiting incentives to specialization for larger, better capitalized farms. To achieve this, the following may be considered:

1. Targeting: Targeting the poorest farmers living in the harshest climate with safety net programmes and other strategies to increase their capacity to diversify, increases the effectiveness of public policies to promote welfare gains among the poor and strengthens climate resilience at the farm level and beyond.

FIGURE 2.
Poor farmers have higher benefits from crop diversification



Source: FAO, Economic and Policy Analysis of Climate Change (EPIC) team.

2. Overcoming barriers: Policy makers may contribute to overcome the barriers to crop diversification by supporting knowledge creation and dissemination and by facilitating market access:

- ▲ **Information and extension services:** Providing information and extension services is key to support crop diversification. Informing farmers about the benefits related to the diversification of crop production is a crucial intervention to boost this strategy.
- ▲ **Market access infrastructure:** Providing infrastructure and supporting investments in input and output markets is necessary to stimulate crop diversification. Policy makers may also analyze the entry barriers for small and medium size enterprises to expand market services in poor areas and to engage in input supply and crop purchases for a wide range of farm products. This may include financing options for these firms, as well as facilitating domestic, regional, and international market access.