



## Climate-smart interventions for smallholder farmers in Ethiopia

Sorghum is one of the major food security crops in Ethiopia, and a staple food for more than 60 million people. The crop is predominantly grown in the dry lowlands where it provides food and is also a major source of animal forage, fuel and building material. Sorghum is primarily produced for household consumption by 5 million smallholder farmers, and a surplus can be generated through the use of inputs and improved varieties. However, the use of improved practices is limited by insufficient economic resources, high labour demand and environmental factors, such as insufficient rains. In addition, poor storage practices result in high losses due to insect pest damage and fungal infestation.

### The challenge

Sorghum production in the dry lowlands, where climate change is creating a higher frequency of drought and crop failures, exposes farmers to food shortages and loss of livestock due to a lack of feed. Currently, 70% of sorghum grain is consumed domestically, with women providing the majority of labour and trading of the crop. Sorghum production is risky, with a lack of economic drivers for increased production. In good years, farmers often have a surplus and grain prices are low; in bad seasons, the reverse is true. The situation is exacerbated by limited storage options, forcing farmers to sell surpluses cheaply at harvest. This prevents small businesses from accessing a reliable supply of grain throughout the year, making sorghum less attractive than alternatives. Rapid population and economic growth are creating new demand for cereals, which could be exploited to generate economic opportunities for smallholder farmers.

### The research

To address key limitations to sorghum production and availability to smallholders in Ethiopia, researchers will develop and deploy key technologies that reduce the risk of crop failure, increase productivity and create new economic opportunities for women-led businesses. The technologies include; drought tolerant sorghum varieties, improved management practices, value-added sorghum products, small-scale threshers, farm-scale grain storage systems and linkages with new markets. The research will focus on facilitating promotion of these innovations, adoption behaviour and the impacts of innovation use on the economics of sorghum production.

### Expected outcomes

- Improved productivity and climate resilience of 240,000 sorghum smallholder farmers;
- Reduced post-harvest loss through farm-scale grain storage options and increased economic opportunities



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for women through value addition, small-scale threshers and improved storage facilities;

- Enhanced capacities of the Ethiopian and Australian research teams in screening breeding lines for root architecture and transpiration efficiency variation using phenotyping platforms and genomics, while farmers will acquire skills in developing and utilizing sorghum-based poultry feed;
- Increased adoption of improved and drought tolerant sorghum varieties, increased use of post-harvest management technologies, and development of new value chains for sorghum;
- Improved economic well-being of disadvantaged rural Ethiopians, particularly women and children;
- Ethiopian Institute for Agricultural Research will enhance staff capacity to breed drought tolerant sorghums and use crop simulation modelling to increase plant breeding efficiency and evaluate the risk of genetic and agronomic interventions.

### Implementing partners:

- Ethiopian Institute of Agricultural Research:  
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