Risk of crop failure from drought is one of the primary reasons why smallholder farmers in Africa do not adopt improved farming practices. A more reliable harvest could give farmers the confidence to adopt new technologies. With the expansion of maize production in the areas susceptible to drought, it is expected that farmers will get higher, stable, and reliable yields. The new varieties are expected to increase yields by 25 percent over current varieties. Strong and consistent policy support is critical to the success of WEMA project is a public-private partnership coordinated by the African Agricultural Technology Foundation (AATF). It is targeted at one of the five countries participating in the Water Efficient Maize for Africa (WEMA) project. Others include Kenya, Uganda, Mozambique and South Africa. This policy brief highlights challenges facing the maize sub-sector in Tanzania. WEMA is strategically designed to mitigate production constraints associated with drought. It is a public-private partnership project formed in 2008 and coordinated by the African Agricultural Technology Foundation (AATF). The partnership is funded by the Bill and Melinda Gates and Howard G. Buffett Foundations. The goal of the project is development and deployment of royalty-free drought-tolerant maize varieties using a combination of conventional breeding, marker-assisted breeding and biotechnology techniques and applications.

**Introduction**

Maize is a staple food for more than 300 million people in Sub-Saharan Africa where it is grown predominantly by smallholder farmers under rain-fed conditions. The arable land under irrigation is approximately 5 percent. In recent years, rainfall patterns have become erratic and unpredictable as climate change takes its toll on agriculture. This makes Sub-Saharan Africa the most vulnerable region to drought-related production constraints. On the other hand, high population growth rate demands for an increase in maize productivity in marginal and drought-prone areas. The need for drought tolerant maize cannot be gainsaid under the prevailing conditions.

Tanzania is one of the five countries participating in the Water Efficient Maize for Africa (WEMA) project. Others include Kenya, Uganda, Mozambique and South Africa. This policy brief highlights challenges facing the maize sub-sector in Tanzania. WEMA is strategically designed to mitigate production constraints associated with drought. It is a public-private partnership project formed in 2008 and coordinated by the African Agricultural Technology Foundation (AATF). The partnership is funded by the Bill and Melinda Gates and Howard G. Buffett Foundations. The goal of the project is development and deployment of royalty-free drought-tolerant maize varieties using a combination of conventional breeding, marker-assisted breeding and biotechnology techniques and applications.

**The importance of maize in Tanzania**

Tanzania’s economy is heavily dependent on agriculture, which accounts for about one third of the Gross Domestic Product (GDP), provides 85 percent of exports, and employs about 80 percent of the population. Maize is the major and most preferred staple food and cash crop in Tanzania (RATES, 2003). The popularity of maize is employed in the manufacture of many other crops including ethanol. Maize, which is the major food crop in the country, is produced on about 85 percent of the land area which is arable and constitutes more than 75 percent of the cereal consumption in the country. About 85 percent of Tanzania’s population depends on it as an income-generating commodity (Sassi 2004; Amani 2004: 5; and Isinika, Ashimogo and

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**References**


Sassi, M. 2004. Improving Efficiency in the Agriculture Sector as an Answer to Globalization, Growth and Equity: The Case of Tanzania”, Quaderno di ricerca n.4. Pavia, Italy.

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**About WEMA**

The Water Efficient Maize for Africa (WEMA) project is a public-private partnership coordinated by AATF to develop drought-tolerant African maize varieties, incorporating the best technology available internationally. The long-term goal is to make drought tolerant maize available royalty-free to smallholder farmers in Sub-Saharan Africa – most of whom are women – so they can feed their families and increase their incomes.

This policy brief is produced by the African Agricultural Technology Foundation (AATF) with contribution from Daniel Otunge, Nancy Muchiri and Grace Wachoro.
Mlangwa, 2003). It is estimated that the annual per capita consumption of maize in Tanzania is over 115Kg; national consumption is projected to be three to four million tonnes per year.

The Government of Tanzania has demonstrated commitment to enhance maize productivity for several decades. Research has been going on under the National Maize Research Programme (NMRP) which started in 1974 to coordinate key aspects of maize research including varietal development and maize management research (Katininga, 1998). The government also takes cognisance of the fundamental contribution that maize can make in meeting the goals and expectations of Vision 2025, the current economic and social development blueprint for Tanzania. The Vision portends the intention of the government to transform the agricultural sector from a rural based economy to commercial oriented sector in order to boost agricultural productivity, enhance food security and self-sufficiency. Tanzania also recently launched a new agriculture policy – *Kilimo Kwanza* (agriculture first). It is the country’s initiative aimed at transforming Tanzania’s agricultural productivity by ensuring access to inputs. The initiative makes provision for the enactment of the National Cereals and Produce Bill. The Bill stipulates policy reforms aimed at improving agriculture and helping cereal producers remain competitive in the global market. Maize is one of the country’s priority cereal crops.

### Challenges facing maize production

Production of maize in Tanzania is dominated by smallholder farmers. Despite the importance of maize as the main staple crop, average yields in farmers’ fields are relatively low averaging 1.2 metric tonnes per hectare compared to the national consumption which is over 115Kg; national consumption is projected to be three to four million tonnes per year.

- **Agricultural pests and diseases**: Maize pests and diseases are a significant challenge, reducing yields and productivity. Diseases such as maize ear blight and maize armyworm, and pests like the fall armyworm, pose major threats. Effective control measures and resistant varieties are crucial.
- **Climate variability and change**: Sudden changes in temperature and rainfall patterns can lead to unpredictable crop yields. Climate change models predict increased variability, which makes disaster risk management vital.
- **Low technology adoption**: Despite increased investment in research, technology adoption by farmers remains low, limiting the impact of improved varieties.
- **Input costs**: Input costs, primarily fertilizers and pesticides, are high, making agriculture less attractive for many farmers.
- **Market access**: Poor market access and price fluctuations can affect farmers’ incomes and incentivize them to grow crops with guaranteed markets.

### The WEMA intervention

Smallholder maize farmers in Tanzania face multiple challenges, which in the short to medium term can be mitigated by raising productivity. Increased productivity is crucial for alleviating poverty and enhancing the livelihoods of smallholder maize farmers who make up the majority of the rural poor in Tanzania (R&AWG, 2005).

The WEMA partnership was formed in response to a growing call by African farmers, leaders, and scientists to address the effects of drought in a way that is cost effective for African small holder farmers.

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**President Jakaya Kikwete Asks World to Help Fight Drought**

Addressing the general debate at the 64th session of the United Nations General Assembly, Tanzanian President Jakaya Mrisho Kikwete said “unprecedented drought” had been gripping Tanzania and neighbouring countries for more than five years, causing severe damage to agricultural production and acute food shortages. He urged the world community to help fight drought in eastern Africa.

“The effects of the drought are threatening to reach catastrophic proportions if the shortage of rain will persist for the next few years,” Kikwete said. “It is important for the United Nations to be aware of this growing danger and look into ways of assisting us.”

“We should not wait until graphic pictures of emaciated and dying children dominate the TV screens and newspapers for us to act,” he warned.

AATF works with the internationally funded non-profit International Maize and Wheat Improvement Center (CIMMYT), the private agricultural company Monsanto, and the National Agricultural Research Systems (NARS) in eastern and southern Africa in this effort. Each partner brings its unique expertise to the project. AATF contributes its expertise in leadership, public-private partnership management, technology stewardship and project management. CIMMYT provides high-yielding maize varieties that are adapted to African conditions and expertise in conventional breeding and testing for drought tolerance. Monsanto provides proprietary germplasm, advanced breeding tools and expertise, and drought-tolerance transgenes developed in collaboration with BASF. The national agricultural research systems, farmers’ groups, and seed companies participating in the project contribute their local germplasm, land, expertise in field testing, seed multiplication and distribution.

The varieties developed through the project will be distributed to African seed companies through AATF as part of their seed business without royalty and made available to smallholder farmers.

The project involves public and private institutions and in the process of implementing the project their capacity and experience in maize breeding, biotechnology, and biosafety is expanded. The benefits and safety of the maize varieties that will be developed will be assessed by national biosafety authorities according to regulatory requirements in the partner countries.

The first conventional hybrids developed through marker-assisted breeding could be available after six or seven years of research and development. For the drought-tolerant varieties developed through transgenic means, it is projected that farmers could have access to the seeds between 2015 and 2017. Development of transgenic varieties will take slightly longer because of the technology development pathway and the biosafety regulatory requirements that have to be addressed prior to commercial release. The maize products to be developed could increase yields by 25 percent compared to current varieties. This increase would translate into about two million additional tonnes of food during drought years.

### Conclusions

Maize is of fundamental importance in Tanzania both as a staple food and cash crop. It plays a central role in the economic and social circles of the Tanzanian economy. The importance attached to maize is also evidenced by consistent efforts by the government at various levels to enhance its productivity. The WEMA project therefore is a