

EXAMPLE TECHNOLOGY	DESCRIPTION	KEY IMPACT BY REGION	CONSTRAINTS TO WIDESPREAD ADOPTION	FOR ADDITIONAL INFORMATION	REFERENCES
Submergence-tolerant rice varieties	Rice varieties that tolerate 2-3 weeks of flooding	Farmers maintain rice yields even in years with flooding. 10+ varieties currently available for South and Southeast Asia. New varieties will soon be available in SSA. Average yield advantage under submergence is 1-1.5 t/ha, with no yield penalty under unstressed conditions.	Scaling is limited by insufficient and/or inefficient government seed systems in many countries. Slow variety release procedures in some countries. Need to upgrade local varieties with the sub1 gene in additional target countries.	International Rice Research Institute (IRRI) <a href="http://irri.org/">http://irri.org/</a>	
Drought-tolerant rice varieties	Rice varieties that tolerate drought conditions	Farmers maintain rice yields even in drought years. New varieties currently available for South and Southeast Asia, soon available in SSA. Average yield advantage under drought: 1 t/ha; no yield penalty under no stress condition.	Scaling is limited by insufficient and/or inefficient government seed systems in many countries. Slow variety release procedures in some countries. Need to upgrade varieties with drought genes in additional target countries	International Rice Research Institute (IRRI) <a href="http://irri.org/">http://irri.org/</a>	
Upland rice varieties	Improved rice varieties adapted to Guinea Savanna and coastal regions of West Africa (Burkina Faso, Mali, Liberia, Sierra Leone)	Yield increases of 100% and above have been observed across the region when improved seed is grown with fertilizer.	Broad variety adaptation and strong interest from seed companies have been instrumental in the swift spread of modern upland rice varieties in Uganda.	Alliance for a Green Revolution in Africa (AGRA) <a href="http://www.agra.org/">http://www.agra.org/</a>	

<b>Rust-resistant wheat varieties</b>	High-yielding, well-adapted varieties that are resistant to devastating wheat stem rust virus seen in recent outbreaks	Widely grown varieties are highly susceptible to rust, causing crop loss and threatening global food security. Resistant plants yield even during outbreaks. In Afghanistan, Pakistan, Bangladesh, Nepal, Tajikistan, Ethiopia, Egypt, and Iraq, yield from resistant varieties is potentially worth \$3.5 billion.	Seed multiplication capacity is limiting.	CGIAR <a href="http://www.cgiar.org/">http://www.cgiar.org/</a>	
<b>Drought-tolerant maize varieties</b>	New, regionally adapted varieties that allow maize to maintain yields under drought conditions	Yield gains of 15-25%, risk reduction	Drought-tolerant varieties must be introduced as part of a package including improved soil fertility and water management techniques in order to realize yield impacts.	International Maize and Wheat Improvement Center (CIMMYT) <a href="http://www.cimmyt.org/">http://www.cimmyt.org/</a>	
<b>Hybrid maize varieties (both white and yellow)</b>	Significantly higher-yielding maize hybrids adapted for Northern Guinea Savanna zones of West Africa (Burkina Faso, Mali, Northern Ghana)	On-farm yields of 5 MT have been observed in Burkina Faso and Mali.	Hybrid maize seed technology is technically demanding, however, top-cross hybrids which are simple to produce have expanded rapidly across seed companies in Burkina Faso.	Alliance for a Green Revolution in Africa (AGRA) <a href="http://www.agra.org/">http://www.agra.org/</a>	
<b>Hybrid maize varieties</b>	Higher-yielding maize hybrids adapted for	Yield increases of 300% have been observed	Foundation seed policies are currently restricting	International Maize and Wheat Improvement	

	Northern and Southern Highland regions of Tanzania and Mozambique	where hybrid maize seed and fertilizer are used together.	access by private seed companies to publicly-bred varieties in Tanzania.	Center (CIMMYT) <a href="http://www.cimmyt.org/">http://www.cimmyt.org/</a>  Alliance for a Green Revolution in Africa (AGRA) <a href="http://www.agra.org/">http://www.agra.org/</a>	
Hybrid, guinea-type sorghum varieties	Higher-yielding hybrid sorghum varieties adapted to Sudano-Sahelian zones of West Africa (Mali, Burkina Faso, Niger)	Hybrid sorghum yields of 3.5 MT per ha have been observed on farmer fields in Mali when soil fertility management and appropriate agricultural practices are used.	Hybrid seed production is technically demanding.	Alliance for a Green Revolution in Africa (AGRA) <a href="http://www.agra.org/">http://www.agra.org/</a>	
Hybrid pearl millet varieties	Higher-yielding pearl millet varieties adapted to the Sahel region of West Africa (Mali, Burkina Faso, Niger)	On-station yield increases of 50% have been registered.	Training of seed companies will be required.	Alliance for a Green Revolution in Africa (AGRA) <a href="http://www.agra.org/">http://www.agra.org/</a>	
High-iron pearl millet	Open-pollinated pearl millet variety with high iron content	Provide women and children with an additional 30% of the estimated average requirement for iron.	Locally popular hybrid varieties with the trait will speed adoption.	International Crops Research Institute for the Semi-arid Tropics (ICRISAT) <a href="http://www.icrisat.org/">http://www.icrisat.org/</a>  HarvestPlus <a href="http://www.harvestplus.org/">http://www.harvestplus.org/</a>	
Provitamin A maize	Five hybrid maize varieties with high	Combat blindness and death in 1.1 M children	Scaling up will require the development of a	HarvestPlus <a href="http://www.harvestplus.org/">http://www.harvestplus.org/</a>	

	provitamin A content	with vitamin A deficiency. Current varieties provide women and children with 25% of the estimated average requirement for vitamin A.	segregated value chain for orange maize among millers.	<a href="#">.org/</a>	
<b>Provitamin A rice (Golden Rice)</b>	Locally adapted public varieties that accumulate provitamin A in the grain	Golden Rice provides about 60% of the Recommended Nutrient Intake of vitamin A for children 6-8 years old. Annual net gains in Asia are estimated at US\$6.3 billion (China), \$2.3 bn (India), and \$4.1 bn for the rest of South and South East Asia.	When Golden Rice will finally reach the farmers very much depends on the regulatory environment of each country.	Golden Rice Project <a href="http://goldenrice.org/index.php">http://goldenrice.org/index.php</a>	
<b>Zinc rice</b>	Rice with enhanced levels of zinc in the grain	Most of the poor in Asia suffer from hidden hunger including zinc deficiency. Zinc is involved in more body functions than any other mineral and is essential for survival.		HarvestPlus <a href="http://www.harvestplus.org/">http://www.harvestplus.org/</a>	
<b>Nutrient Manager for rice and maize</b>	Software for web or mobile phones to make field-specific fertilizer recommendations for rice in the Philippines, Indonesia, Bangladesh, China and 4 countries of West Africa	Use can increase yield (typically by 10-20%), nutrient use efficiency and farmer profit (performance target is at least \$100/ha extra profit).	Need to develop self-sustained business models for wider rollout, including packaging with other mobile phone or ICT services.	International Rice Research Institute (IRRI) <a href="http://irri.org/">http://irri.org/</a>	