



# EverGreen Energy – an integrated power-generation food-production system for Africa

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TRANSFORMING LIVES AND LANDSCAPES

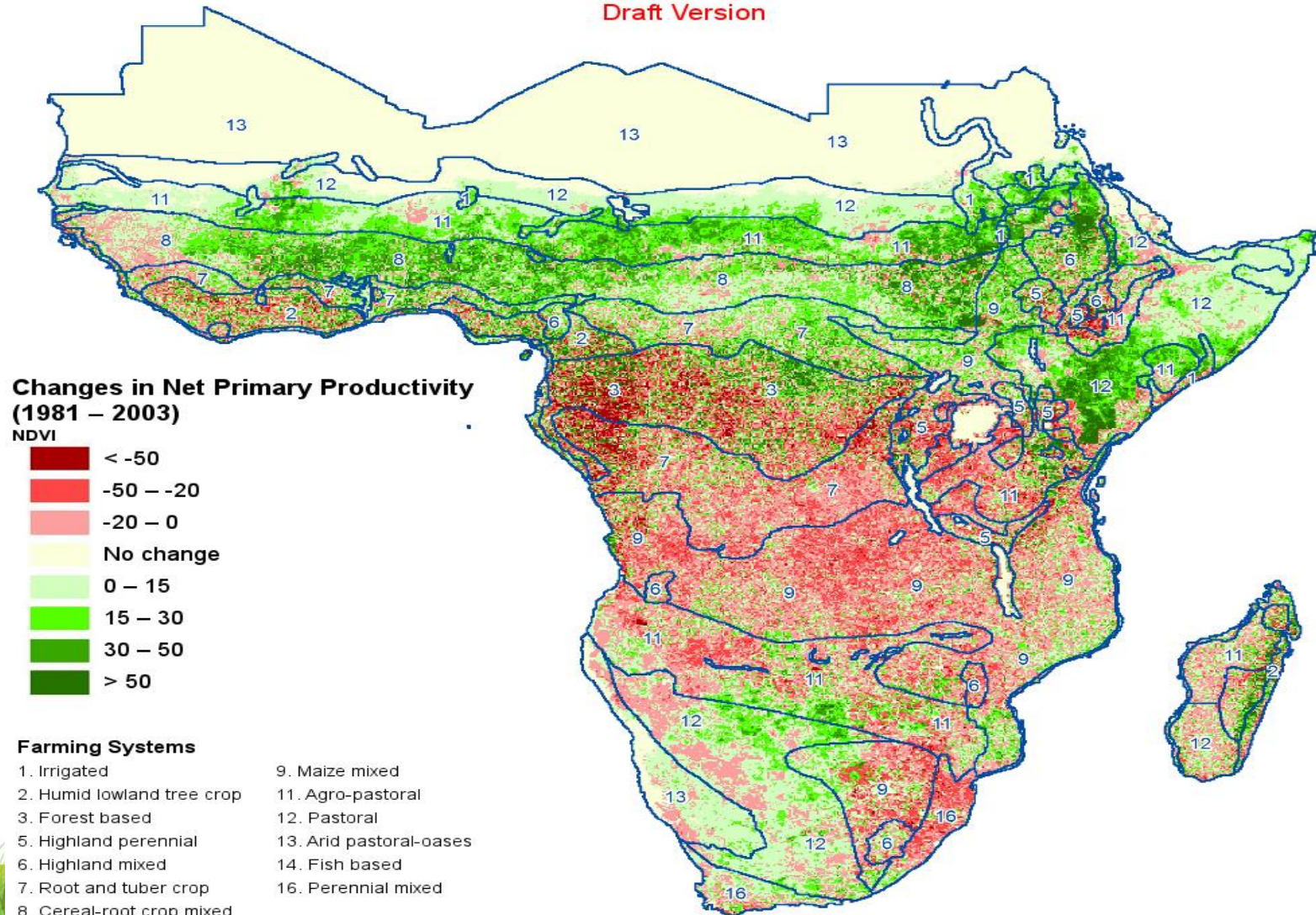
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# Alarming Land Degradation in Southern Africa

## Trend in biomass productivity by farming system

Draft Version



# *The Opportunity*

**South-South Extension of a Fully Commercialized Food-Energy System from Sri Lanka to Eastern and Southern Africa**



**Gliricidia trees intercropped with smallholder coconut in Sri Lanka. The trees are pruned every 8 months. The wood is feedstock for electrical power generation. The foliage is used for biofertilizer and fodder for livestock on the farm.**



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# 3.5 kv gassifier – 10+ HHs



# 35 kv gassifier – small plant & 10+ HHs



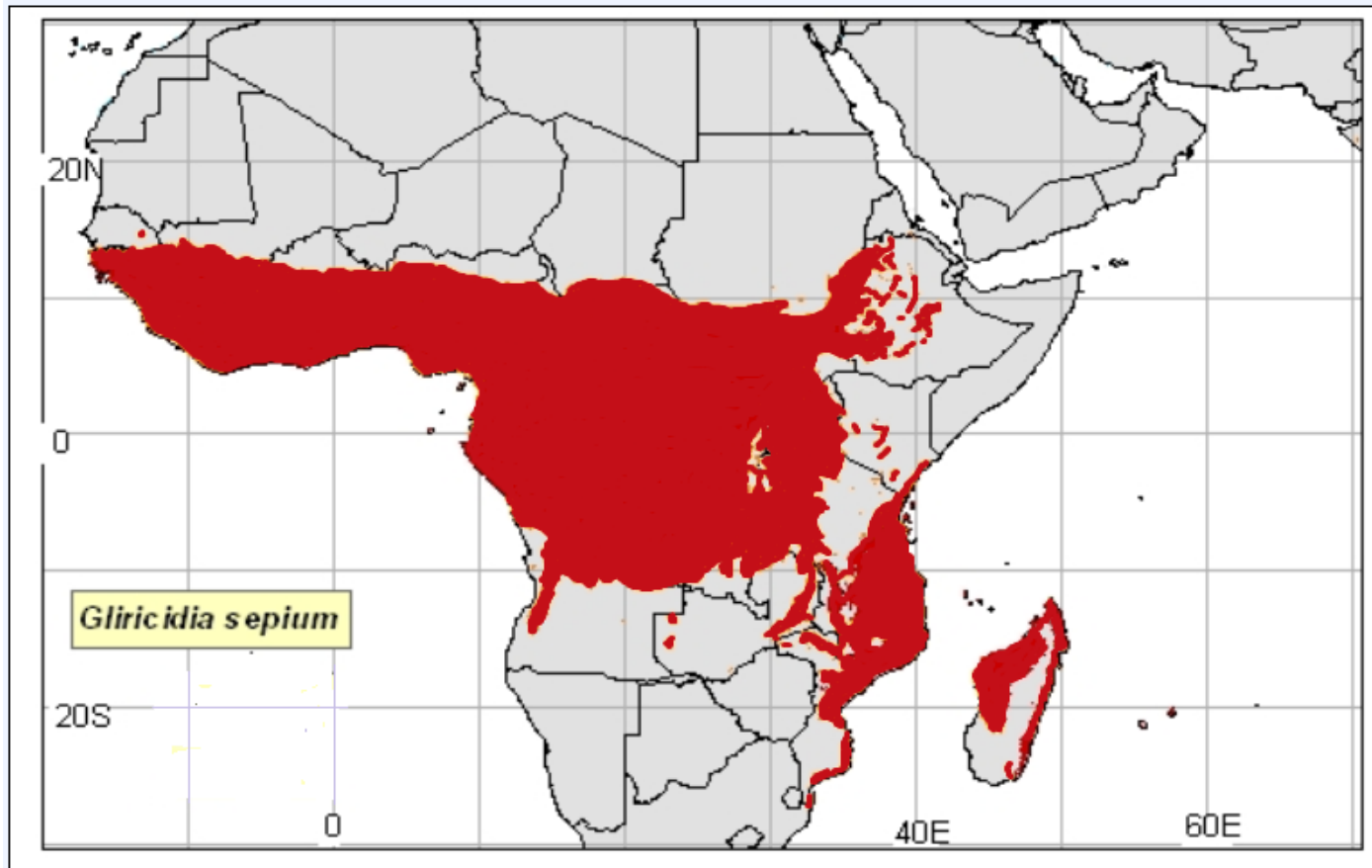


# Industrial size gassifier – large plants



# Commercialization of gliricidia power generation in Sri Lanka

- **Tokyo Power** commissioned a 10 MW gliricidia-fueled plant in Trincomalee in 2009
- **A second Tokyo Power plant** of 5 MW capacity in Mahiyanganaya in early 2014.
- A 15 MW plant is operating in Embilipitiya.
- A 500 kW plant is operating in Thirappane (Anuradhapura)
- At least 10 more plants are being developed throughout the country.

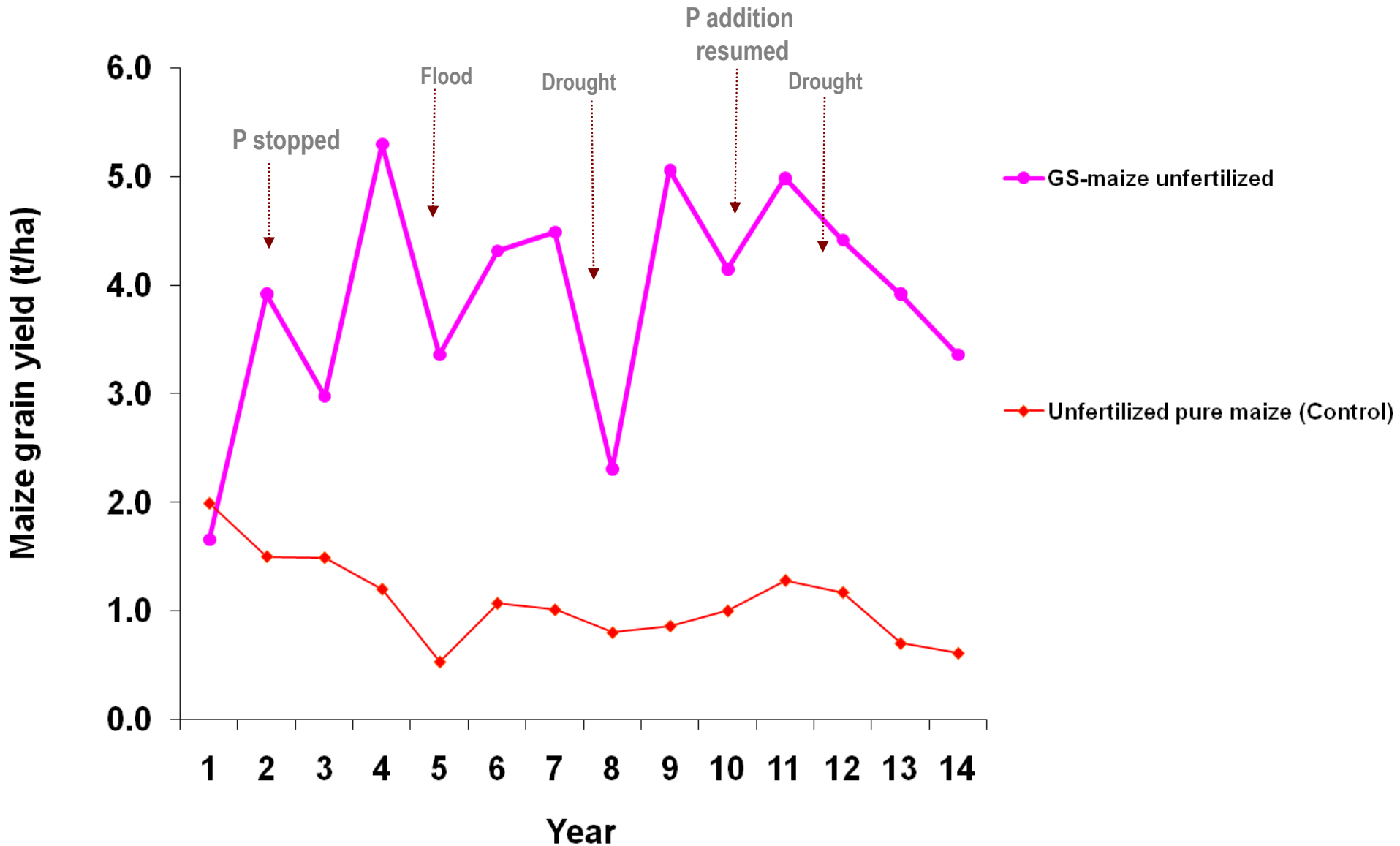


**Gliricidia is distributed throughout Africa and used by farmers as an excellent source of biofertilizer and fodder**



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# Long-term maize yield without fertilizer in a *Gliricidia* system



## ***Impact of fertilizer trees on maize yield under farmer management***

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<b>Plot management</b>	<b>Yield (t/ha)</b>
<b>Maize only</b>	1.30
<b>Maize + fertilizer trees</b>	3.05

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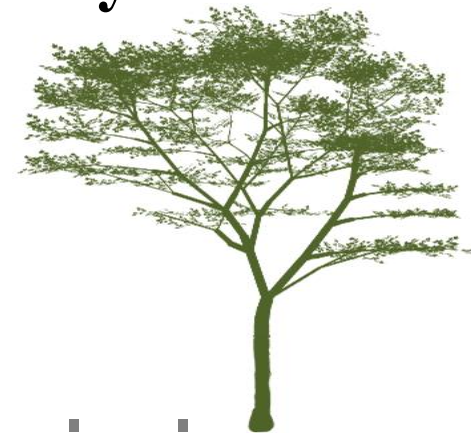
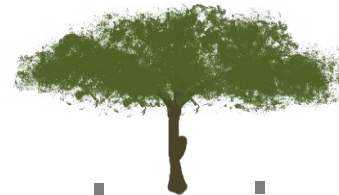
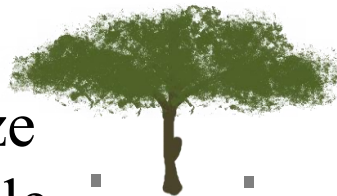
**2011 Survey of farms in six districts (Mzimba, Lilongwe, Mulanje, Salima, Thyolo and Machinga)**

## DRY SEASON

# Fertilizer-Fodder-Fuelwood Trees in Food Crop Production Systems



Maize  
stubble



Gliricidia

Faidherbia

## WET SEASON

Faidherbia



Maize



Gliricidia



# Malawi National Agroforestry Food Security Programme





# EverGreen Energy

- *Gliricidia* already widely distributed
- Major species in Malawi for increasing crop yields in AFSP program
- Massive scaling-up programs in Malawi and Zambia and other countries already in place

## Local:

- Small scale 4 KW and 9 KW Ankur gasifier systems operated by small holders and communities for their local power needs.

## Industrial:

- Similar to 1 MW plant in Walapane, Sri Lanka. Private sector investment would build and operate the plants to supply local communities and local industry.

## National grid:

- Similar to 5 or 10 MW Tokyo Power projects. Large scale plants can be strategically placed to ensure feedstock and supply power to the national grid.

## ***What Needs to be Done?***

- **Research, feasibility analysis, and public-private partnership development** to pave the way for
- **Attracting and harnessing substantive levels of commercial and public investment** in the development of an
- **Agroforestry-based energy industry in Eastern and Southern Africa**, with an emphasis on
- **Implementing new commercial-scale projects** that can fully demonstrate the potential for expansion.

# 18 African countries are now engaged in EverGreen Agriculture

