

# **Miombo Workshop**

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## **Energy Sector Role in Sustainable Forest Management Finance**

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# Art 3.3 of the UNFCCC

- “**The Parties** should take precautionary measures....’
- ‘where there are **threats** of serious or irreversible damage , **lack of full scientific certainty** should not be used as reason for postponing such measures ...[which] ... should be **cost effective** so as to ensure **global benefits.**”

**The bad news:**

**there is such a threat and earth is in crisis**

# Surface Melt on Greenland

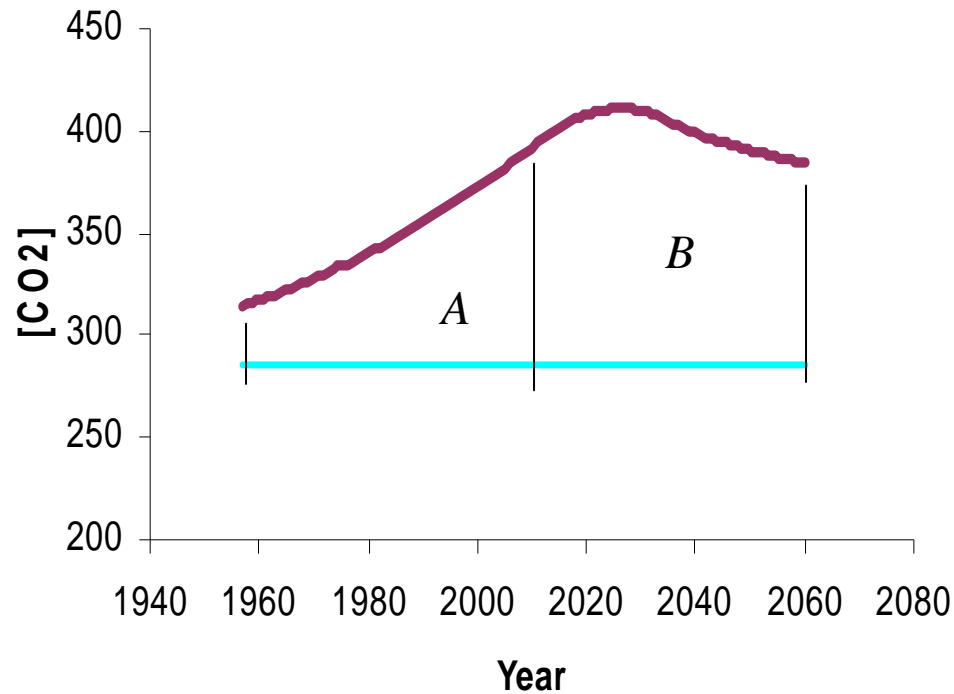
Melt descending into a moulin, a vertical shaft carrying water to ice sheet base

Quite a bit of basal lubrication here ! (*PR*)



Source: Roger Braithwaite, University of Manchester

# The metric for this : the integral or cumulative thermal input



Thermal input to the climate system in the last half century  
and in the next **if emissions are reduced to zero by 2035**

# “Biage” may be needed

In a medical catastrophe doctors practice triage

The walking wounded are given an aspirin and told to walk

The hopeless cases are comforted with morphine

Doctors focus on saving those who can be saved

Biage:

Some land use change is needed to save the planet

Other land (esp hotspot land) would be used for conservation of biodiversity including migration trails etc., under land use planning that forms part of a bi-lateral or multi-lateral sustainable biosphere carbon stock management agreement.

# **The good news**

**EMMISSIONS REDUCTIONS IS HARD (not cost effective) BUT**

**(besides being effective, possibly effective enough but we may need cloud albedo modification also)**

**CARBON REMOVALS IS EASY**

**and widely beneficial because it means**

- **Better soil quality with reduced fertilizer use**
- **Better water and nutrient management**
- **Better rural livelihoods**
- **Secure food supplies**
- **Geographically diversified energy supply**
- **Etc etc etc**

**Why is this?**

**Clear your minds of the idea that CO<sub>2</sub> emissions stay in the atmosphere for 150 years**

**They stay in the atmosphere-ocean-biosphere system for 150 years**

**About 120 Gt [C] exchanged with oceans annually**

**About 110 Gt [C] exchanged with biosphere annually**

**About 780 Gt [C] in the atmosphere**

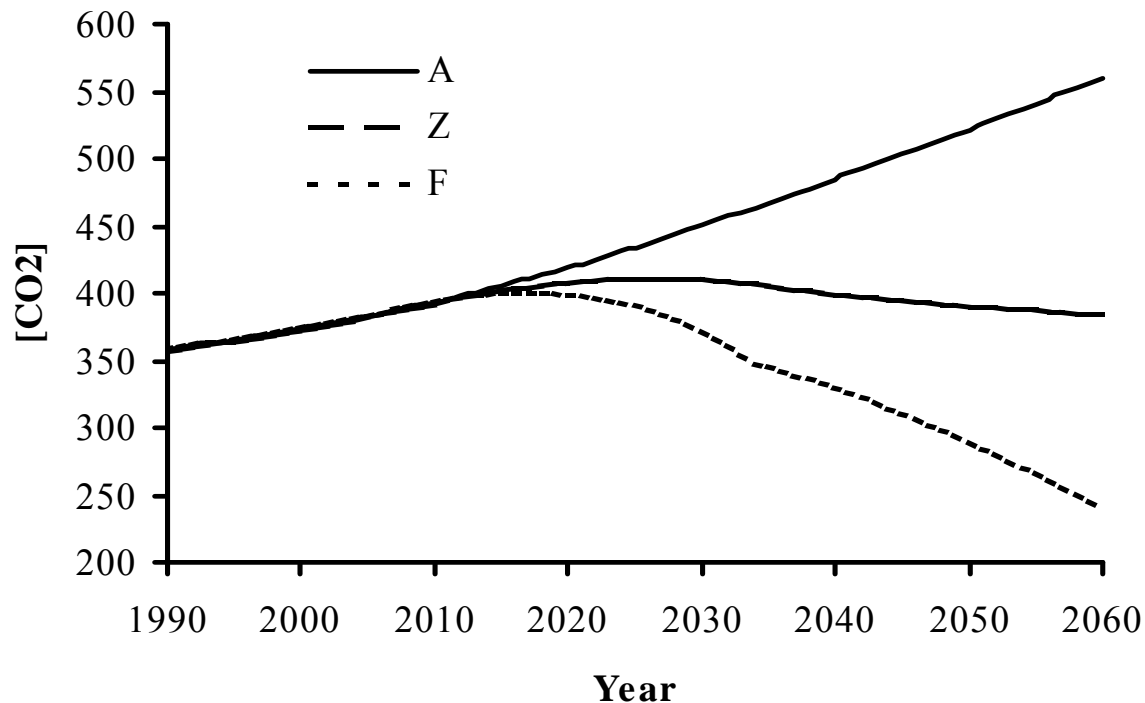
**So emissions stay in the atmosphere for <4 years**

**No easier to extract from ocean than atmosphere**

**And 60 Gt [C] exhaled immediately by plants in meeting their energy needs**

**So about 60 Gt [C] is fixed annually by photosynthesis, meaning that that atmospheric C cycles through the biotic stock of carbon about every 13 years or so giving us about 12 opportunities during That 150 years to grab some of it and stock it somewhere safer**

## Comparison of carbon removals (F) with emission reductions (Z) in mitigating the level of CO<sub>2</sub> (in ppm) in the atmosphere



- A SRES-A2
- Z SRES-A2 with a transition to zero emissions technologies between 2011 and 2035
- F SRES-A2 with a transition to land improvement carbon removal technologies over the same period, with land use change complete by 2035 and technological progress to 2060

## Where?

**There is no shortage of land, there is a desperate historic lack of investment in land: “global gardening” is needed – treat farmland and forest land like a good gardener treats his soil**

Potential rain-fed arable land, net of protected land and urban settlement, has been estimated by Moreira [28] based on IPCC and FAO studies [29,30], viz:

	Gha	%used	available (Gha)
Sub Saharan Africa	1.05	15	.893
North Africa and Near East	.04	100	
North Asia Urals Eastwards	.28	64	.101
Asia and Pacific	.74	64	.266
South and Central America	.98	15	.833
North America	.43	54	.158
Europe	.32	63	.118
World		3.82	38
			2.38
			of which 1.99 tropical
			.38 temperate

**Some of this is miombo some obviously not**

# Sustainable Biofuels Consensus

[http://www.sef.org.nz/views/Sustainable\\_Biofuels.pdf](http://www.sef.org.nz/views/Sustainable_Biofuels.pdf)

**The Sustainable Biofuels Consensus is the outcome of a four day expert workshop held under Chatham House rules and hosted by the Rockefeller Foundation at its study centre at Bellagio on Lake Como, near Milan. The original vision for workshop output was a North-South Biofuels Pact.**

**In the circumstance of negative publicity for biofuels, with substantially misinformed media discussion, we devoted effort to providing a balanced assessment of the food versus fuel debate, of the question of indirect impacts of biofuels on landuse worldwide, and of the question of carbon debt arising from poorly managed land conversion.**

**In reality the currently observed negative effects arise mainly as the consequence of the barriers to trade erected by just those countries that are imposing biofuels mandates, all of which could be met by expanded exports of very positive carbon benefit, sugar-cane based ethanol exports from developing countries, using land that is not currently in food production – e.g miombo.**

**Integrate and better coordinate policy frameworks**

**Assess benefits and impacts of biofuels trade, use and production, and monitor them**

**Reward positive impacts and investments, including through carbon management**

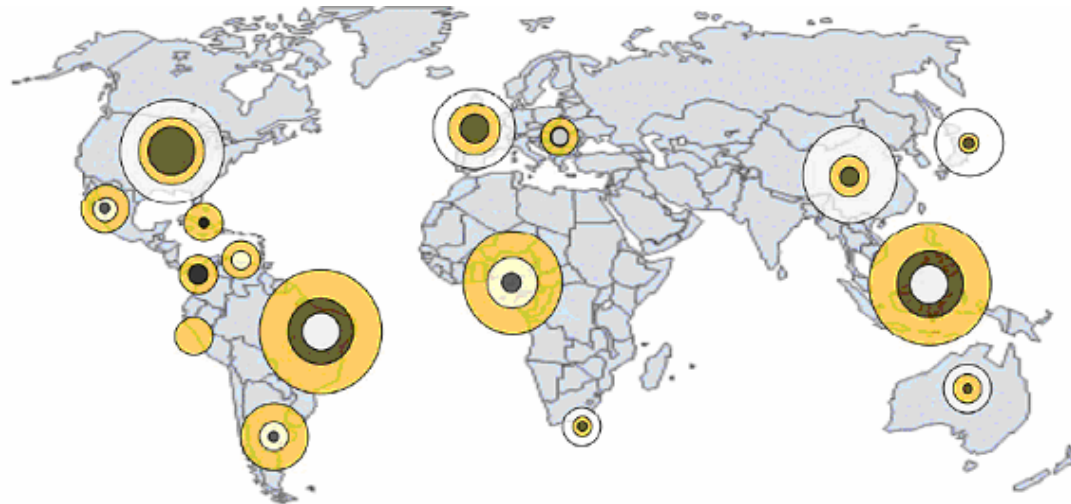
**Address negative indirect effects of biofuels trade, use and production**

**Use informed dialogues to build consensus for new projects**

**Increase investment in research, development and demonstration**

**Build capacity to enable producers to manage carbon and water**

**Make sure that trade policies and climate change policies work together**

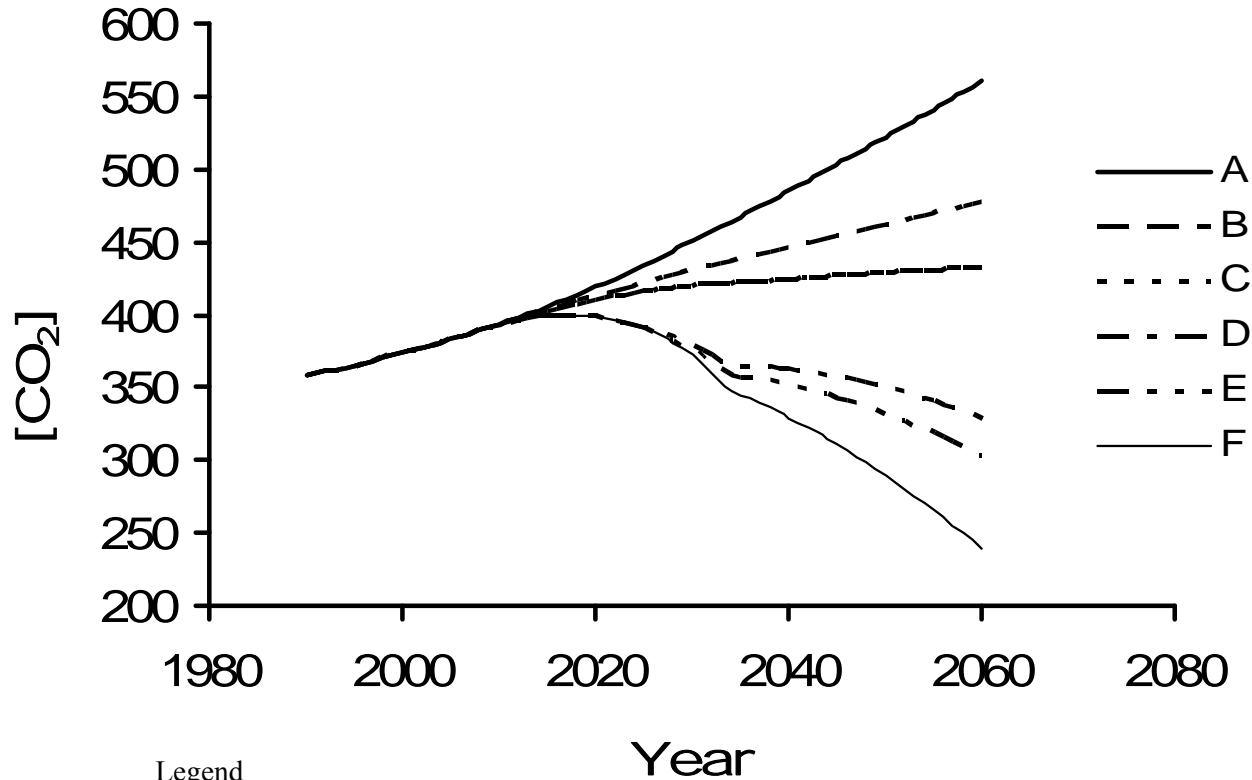


- Feedstock potential based on land available for devotion to first generation biofuel feedstocks.
- Theoretical biofuel demand, assessed to be ~30% of liquid transport fuel consumption in 2006.
- Biofuel production capacity in place at year end 2006.

- Feedstock potential exceeds biofuel demand and surplus production capacity - so export.
- Capacity less than biofuel demand so investment in infrastructure warranted to encourage export potential.
- Feedstock constrained and capacity less than demand - so import.

Source: New Energy Finance [www.newenergyfinance.com](http://www.newenergyfinance.com)

# How does forestry come into this ?



## Legend

A SRES-A2

BSRES-A2 with sugar cane land use change activity [lower case refers to figure 3 with land areas halved]

CSRES-A2 with sugar cane and switch-grass land use change activities

DSRES-A2 with sugar cane, switch-grass and forestry land use change activities

ESRES-A2 with three land use change activities and low cost capture and storage (CCS) of fermentation CO<sub>2</sub>

FSRES-A2 with three land use change activities CCS of fermentation and flue gas CO<sub>2</sub>

**So, for the first few decades, a vast expansion of sustainably managed commercial forestry is the main game for saving the planet**

“Biage” means conserving bio-diversity and cultural traditions in ~equal areas alongside the carbon management areas.

1 billion Ha of new commercial forest (providing employment as well as firewood from thinnings) does **not** mean 1000 plantations each 1 million Ha

It means ~1 million plantations 40,000 per year, for 25 years, each ~1000 Ha adapted to the cultural and environmental conditions of local communities and developed following sustainable best practice guidelines (e.g. biochar for cleared biomass)

# Capacity Building

So we need a corps of several tens of thousands of grassroots entrepreneurs trained to:

- understand the science and the technologies of carbon stock management
- to access markets and sources of finance for CSM projects
- and to communicate with, and engage the commitment of, rural communities to the prospect of improved lifestyles and other millennium development goals that can be secured through well conceived projects

# Where's the money coming from?

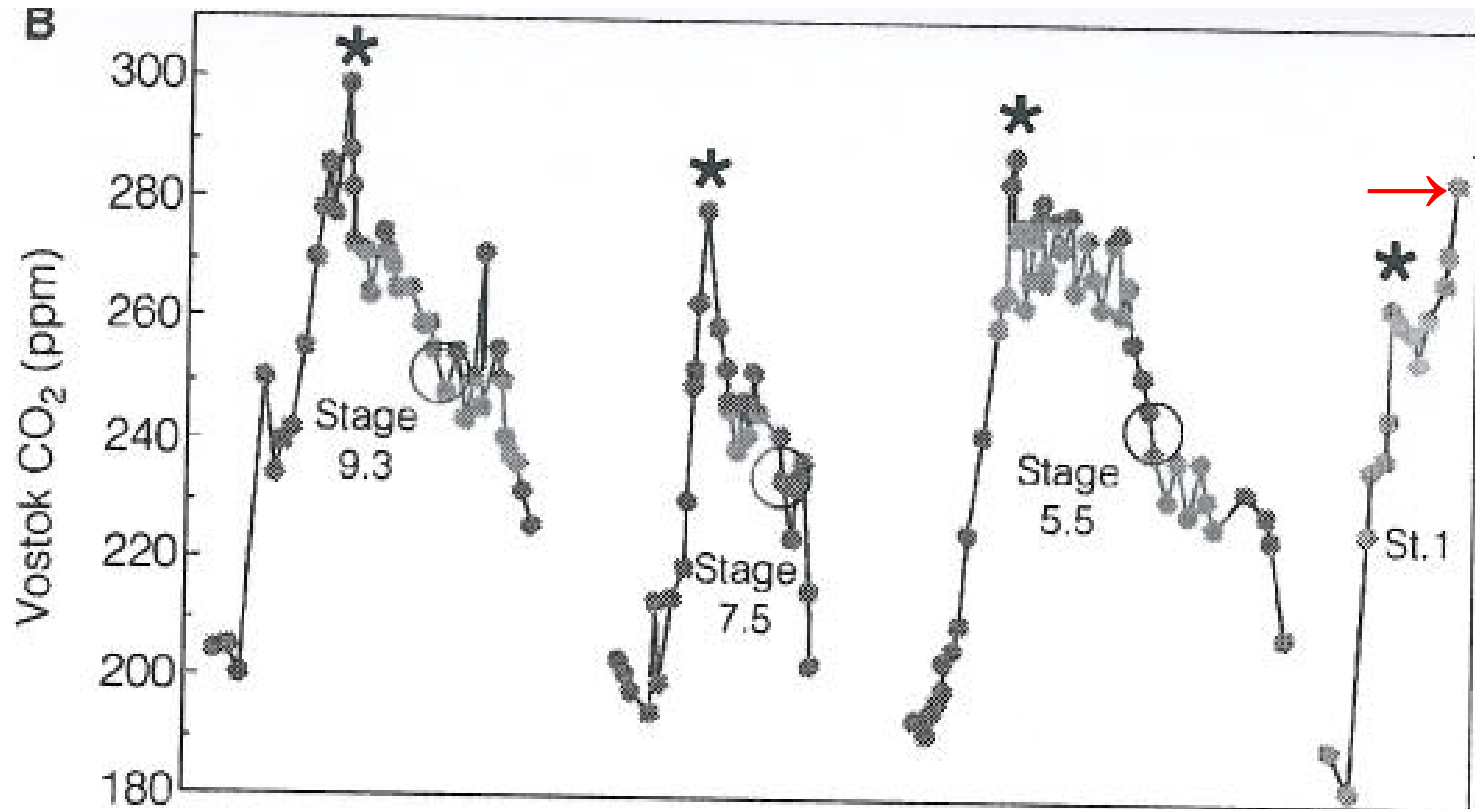
For capacity building? This is a pure public good that should be financed by the GEF (about \$50m a year should yield an adequate flow of trained grassroots entrepreneurs)

For forestry projects? Similar to a biofuel obligation, fossil fuel extractors or importers must be obliged to invest in a stock of biotic carbon that will, over a rotation (25yrs?) absorb the CO<sub>2</sub> emitted when their product is sold and eventually yield biofuels

Which brings me back to the title of this talk

Thank you

# 6000 years of anthropogenic climatic change – W Ruddiman



Ca. 6000-year deglaciations followed by slower glaciating phases in the last ~half million years. \* indicates the insolation peaks ending the warming phases. Note → the increase of CO<sub>2</sub> levels since the last (St1) insolation peak, attributed to anthropogenic emissions related to forest fire deforestation in the course of land clearance for agricultural expansion (*PR*)