Growing Food for a Hungry Planet

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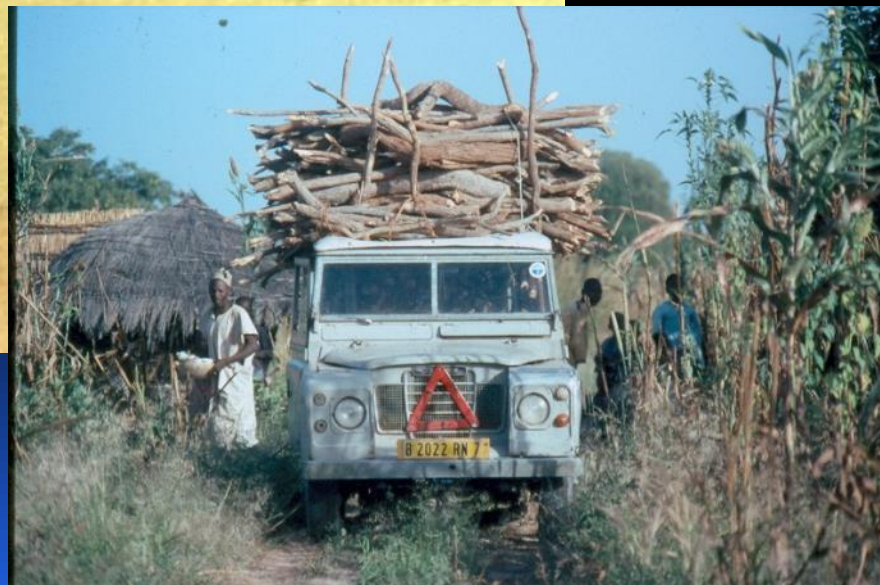
Niger – 1980's




Kodak
GOLD
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Kodak
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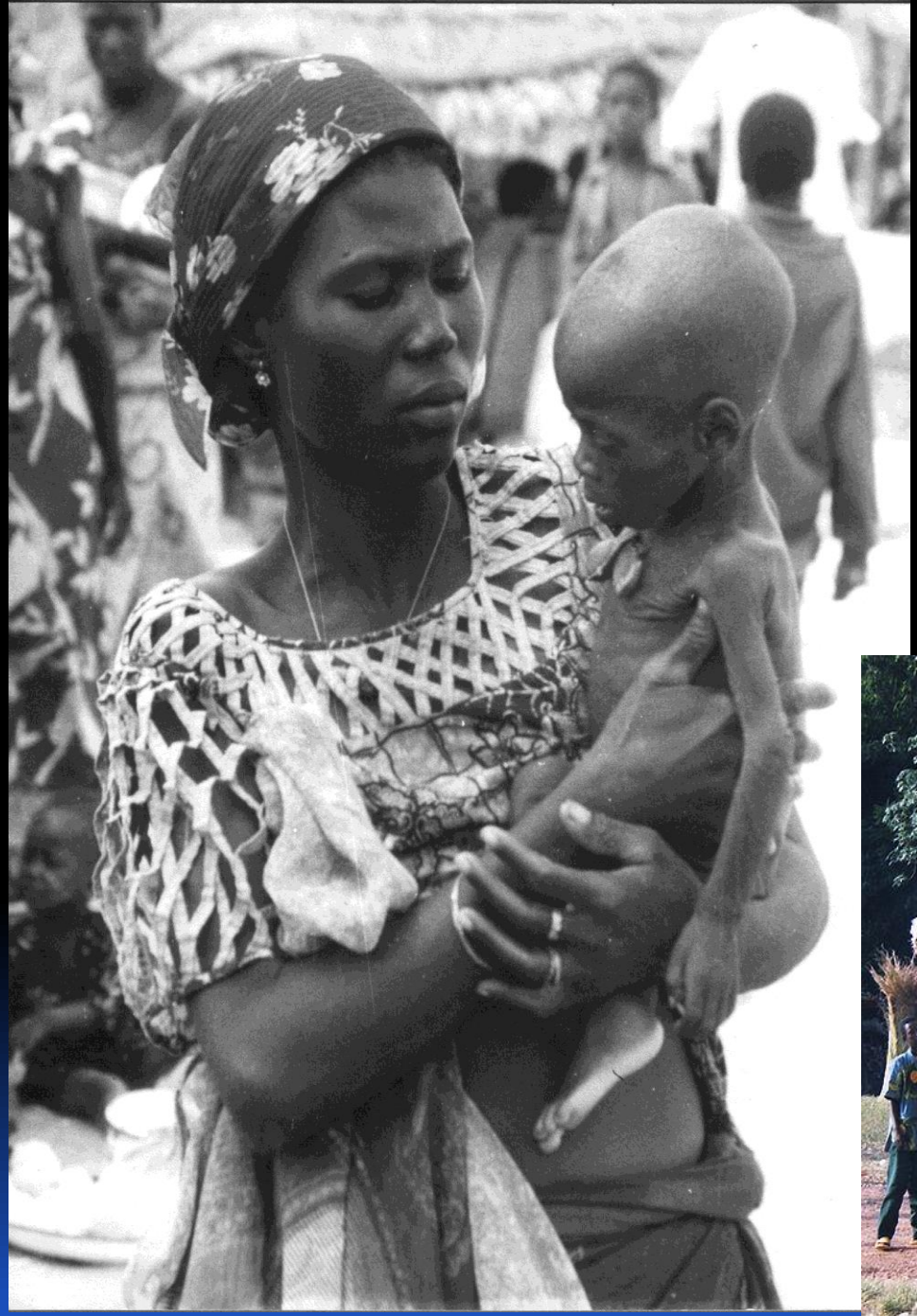
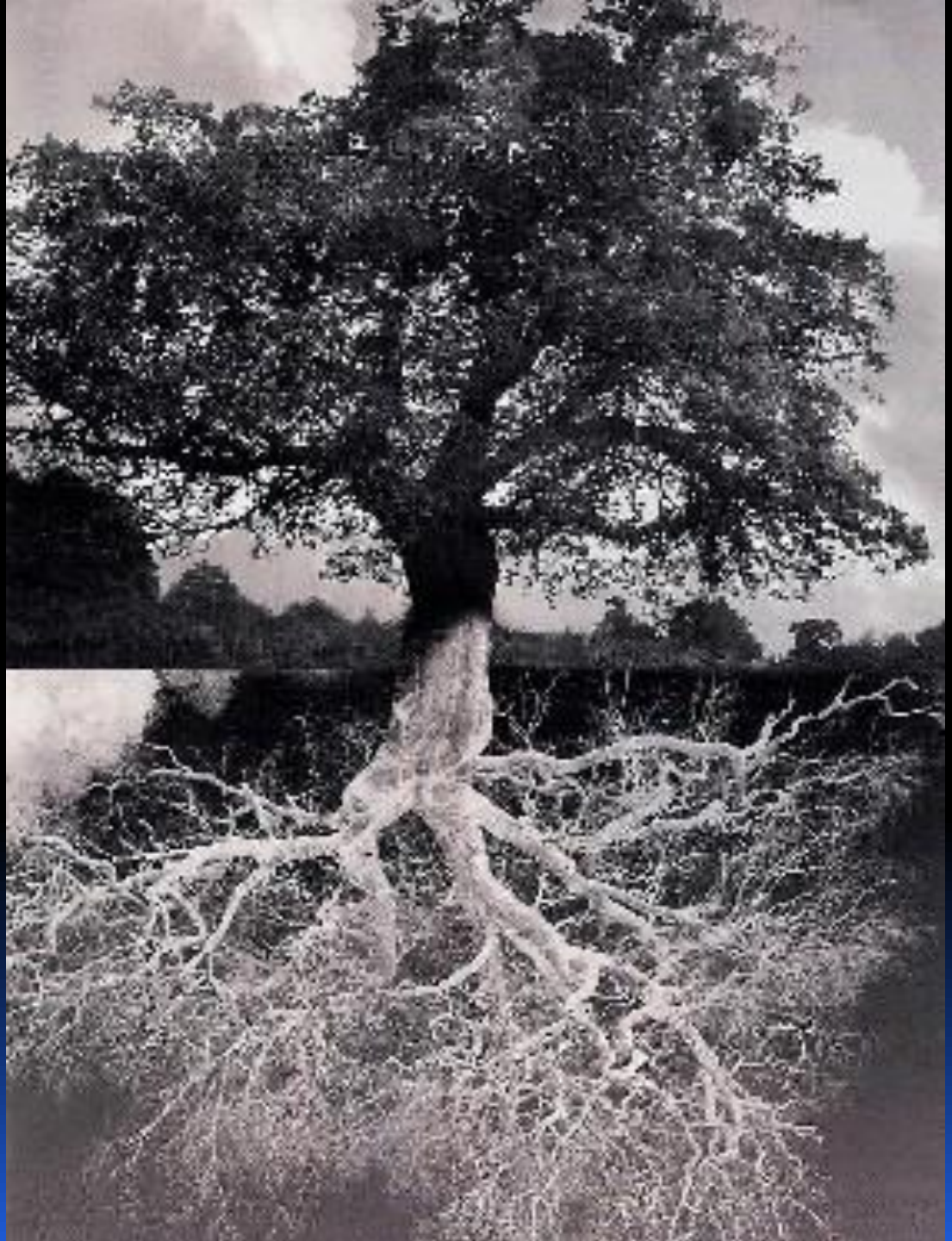



MITSUBISHI

II Peter 1:3 God has given us everything that we need for life and godliness through our knowledge of him.

Even in Niger Lord?

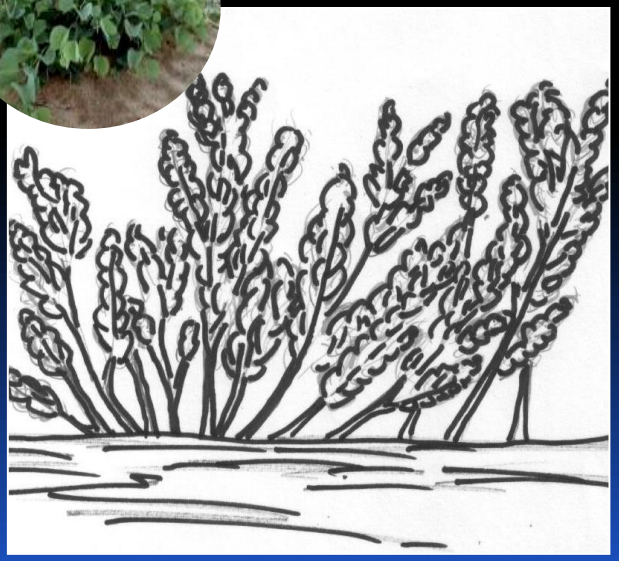


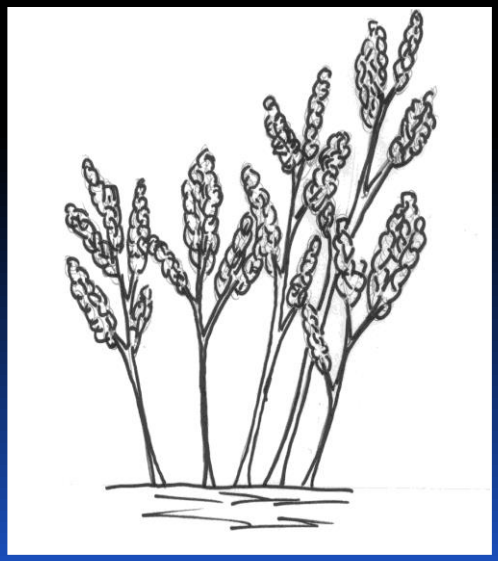
FMNR: Systematic regeneration & management of trees from living tree stumps, roots & seedlings on farmland, rangeland forestland & so called wasteland.

Select desired tree stumps and for each stump, choose number of (tallest and straightest stems to leave

Remove unwanted stems and side branches

Cull emerging new stems and prune side branches from time to time





Greater crop resilience to drought.

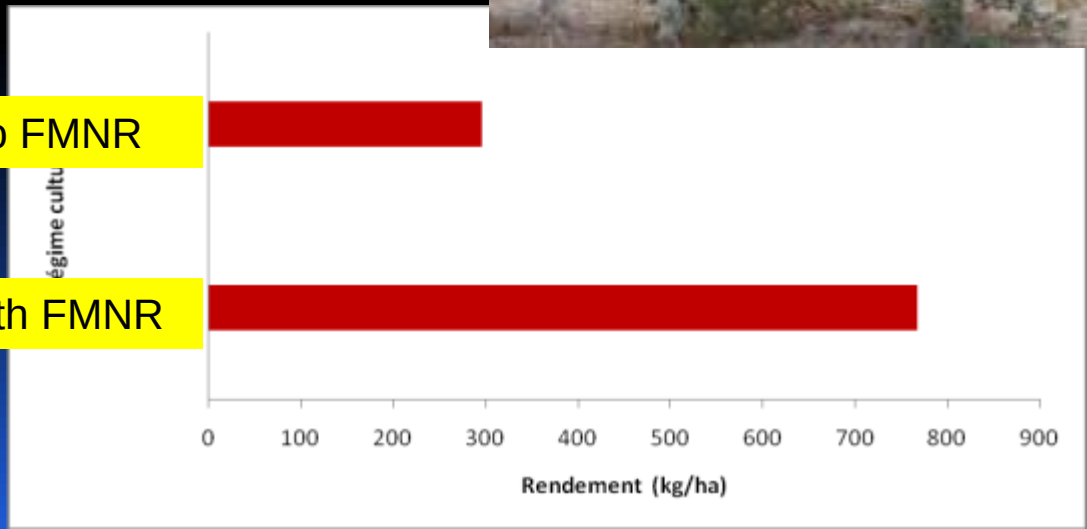
Increased availability of fodder.

Niger: + 500,000 tonnes of cereals/year Re-Greening the Sahel: Farmer-led innovation.... Reij et. al.

+ ~ $ 200 / year. Added value UNDP, 2008, Turning back the desert.

Crop yields doubled

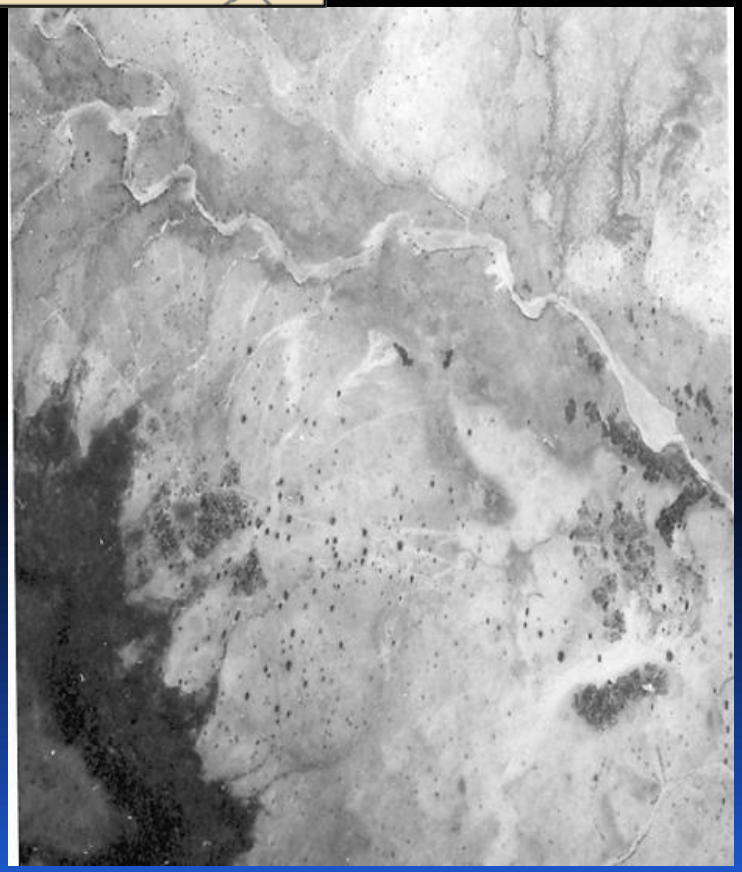
Senegal Agric. Research Institute. 2010



Wild Fruits.

5 million hectares in a 20 year period = 250,000 ha/yr

Vegetation in Galma in 1975 and 2003



Increased food security. In many cases, cereal yields have doubled or more per hectare (Pye-Smith 2013).

Farmers produce 500,000 more tons of cereal per year than in the 1970s and 1980s (Reij et al. 2009).

As a result, 2.5 million people are now more food secure (Reij et al. 2009). Based on an average yield of 100kg/ha/year on 5 million hectares of land.

Extrapolating the added income from FMNR to the entire 5 million hectares implies aggregate income benefits of $900 million/year (Sendzimir et al. 2011) benefiting ~ 900,000 households (4.5 million people).

Sendzimir, J., Reij, C.P., Magnuszewski, P. 2011. Rebuilding Resilience in the Sahel: Regreening in the Maradi and Zinder Regions of Niger Ecology and Society 16 (3): 1 http://www.ecologyandsociety.org/vol16/iss3/art1/

Pye-Smith.C. 2013. The Quiet Revolution: How Niger's farmers are re-greening the parklands of the Sahel; ICRAF Trees for Change no.12. Nairobi; World Agroforestry Centre.

Reij, C., Tappan, G., Smale, M. 2009. Agro-environmental transformation in the Sahel: another kind of "Green Revolution". IFPRI Discussion Paper 00914. International Food Policy Research Institute, Washington DC

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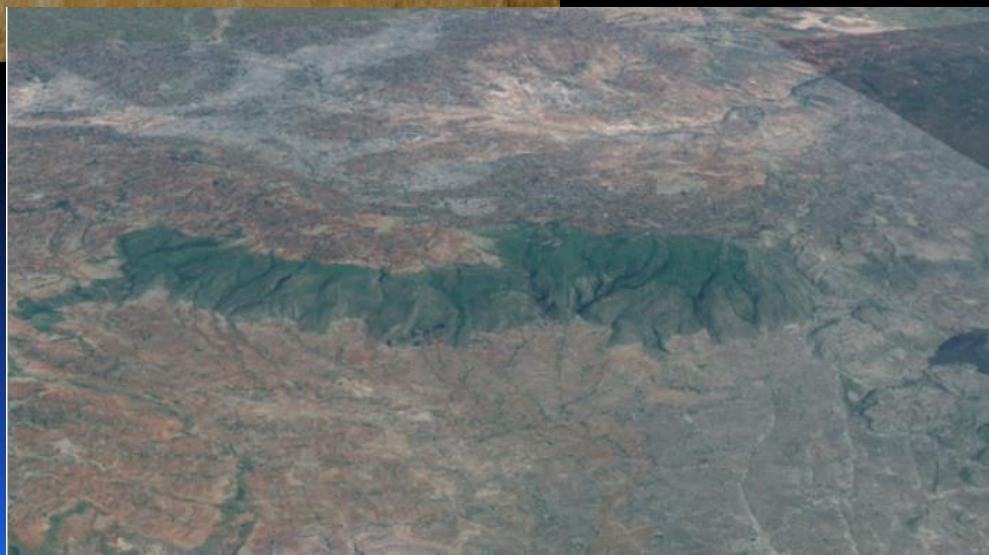
World Vision

ARCTIC OCEAN
Greenland
Arctic Circle
EUROPE
NORTH AMERICA
Tropic of Cancer
PACIFIC OCEAN
ATLANTIC OCEAN
Tropic of Capricorn
SOUTH AMERICA
AUSTRALIA
Antarctic Circle
ANTARCTICA

2013
2014
2016
2012
2017
2011
2015

2,700 ha. Humbo Community Managed Natural Regeneration Project, Ethiopia.

“We are too much happy.”



Zambia is losing 300,000 ha. (3,000 km^2) of forest per year. At this rate, there will be no forest left in just 15 years

Cosmetics
Tourism
Artefacts
Honey

August, 29, 2014. Therefore, they RECOMMEND AND PROPOSE that the drylands development community, through the African Union, and all collaborating and supporting organizations, commit seriously to achieving the goal of enabling **EVERY farm family and EVERY village across the drylands of Africa to be practicing FMNR and ANR by the year 2025.**

Questions?

Why is that child hungry -

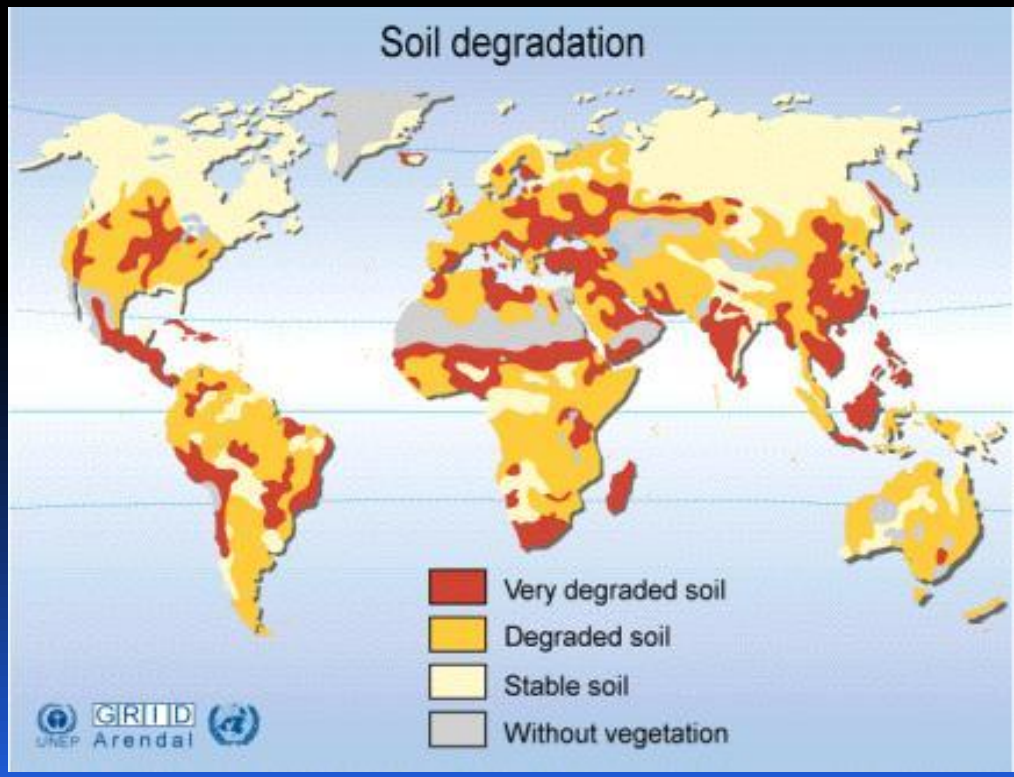
From a natural resources perspective

The 4 ecosystem services

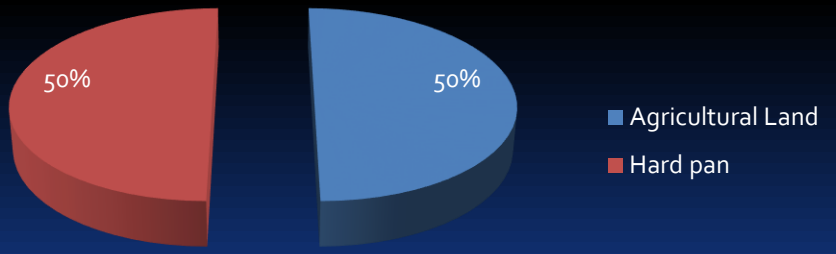
Vegetative Cover

(Energy flow)

Some 40% of soil used for agriculture around the world is classed as either degraded or seriously degraded.



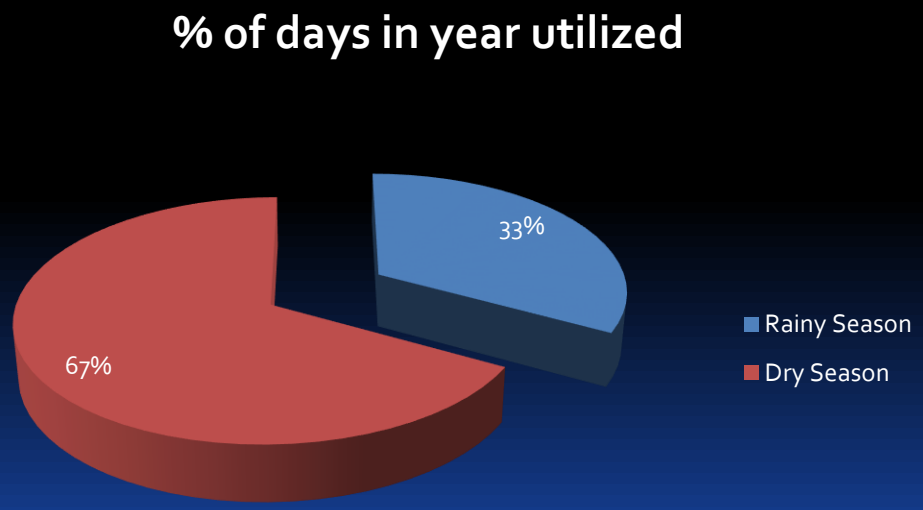
% of land by land type



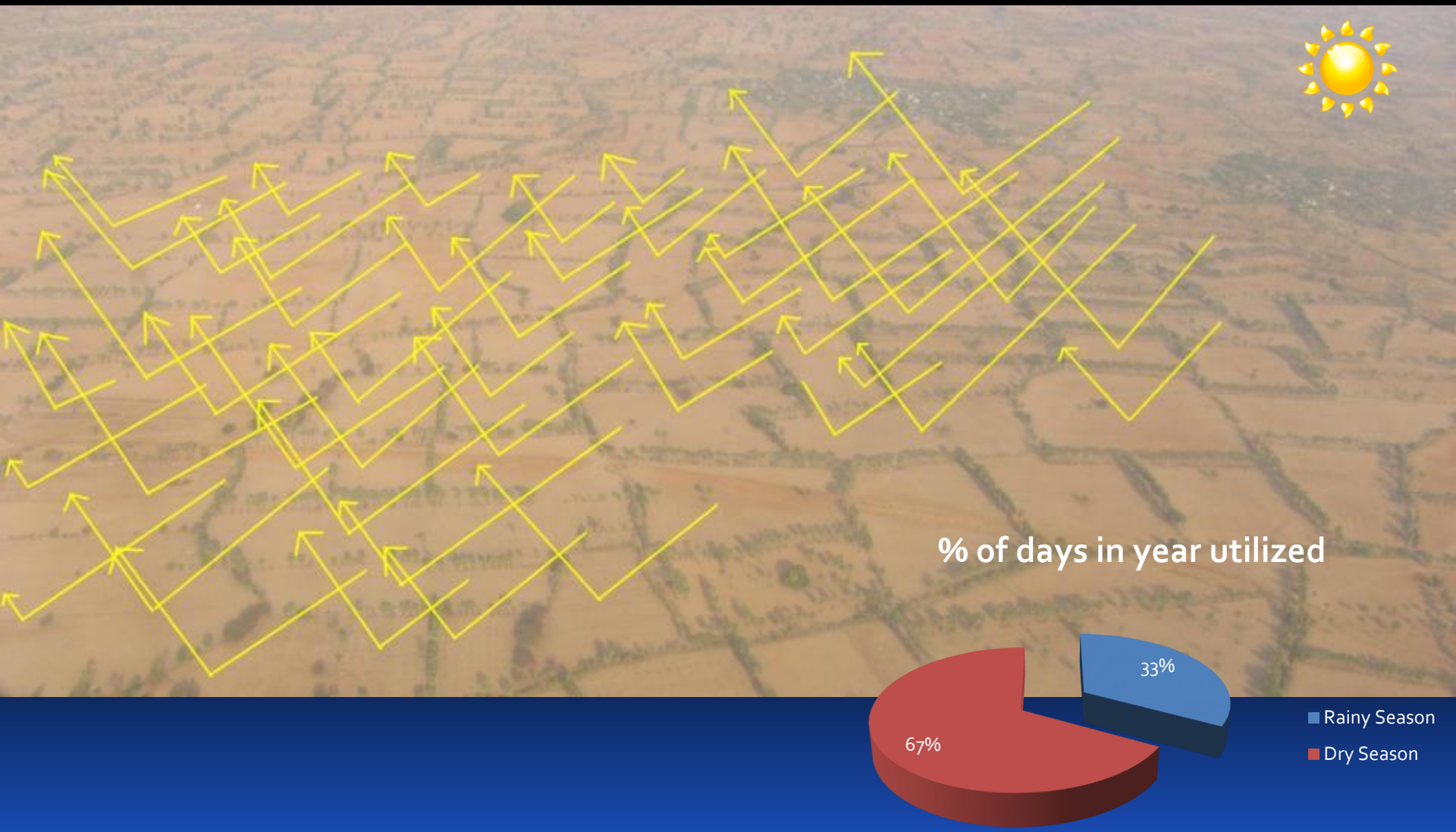
In some regions, 50% of the landmass is idle for 100% of the time = a lost opportunity.

By relying predominantly on annual crops, only 33% of the days in the year are utilized i.e. Only 33% of available sunlight. If drought or other calamities occur 0% of the available sunlight may be used for food production.

= lost opportunity.



When multiplied across a landscape, the amount of un-utilized sunlight is Staggering: Most land for most of the time is not used!



Roselle

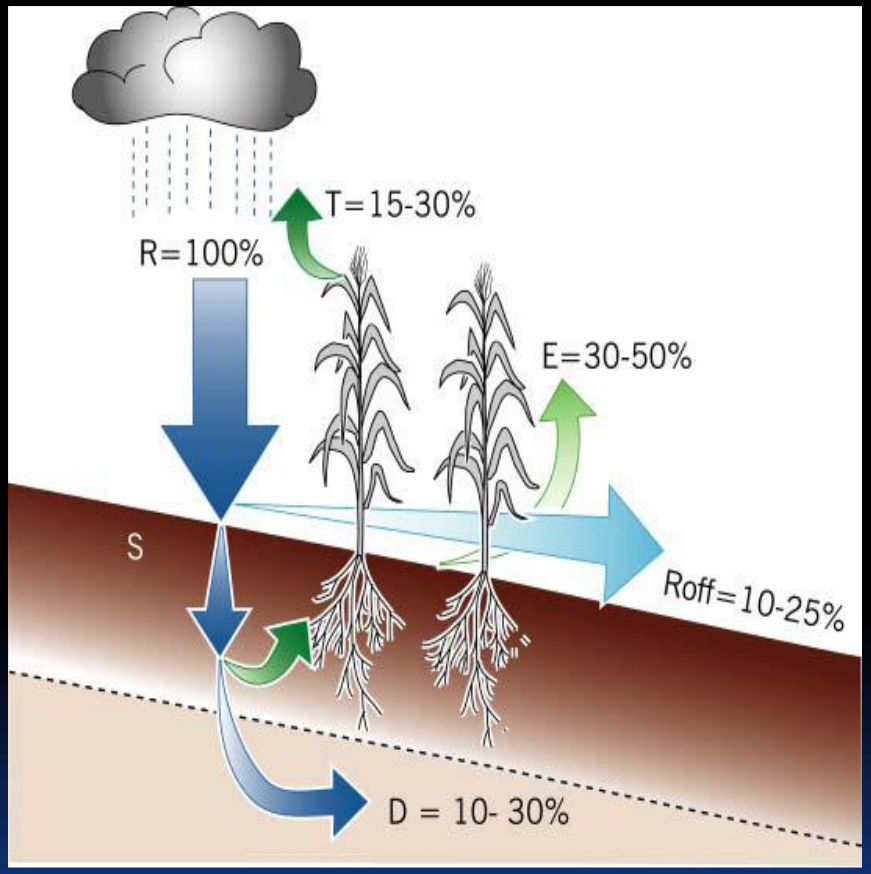
Cassava

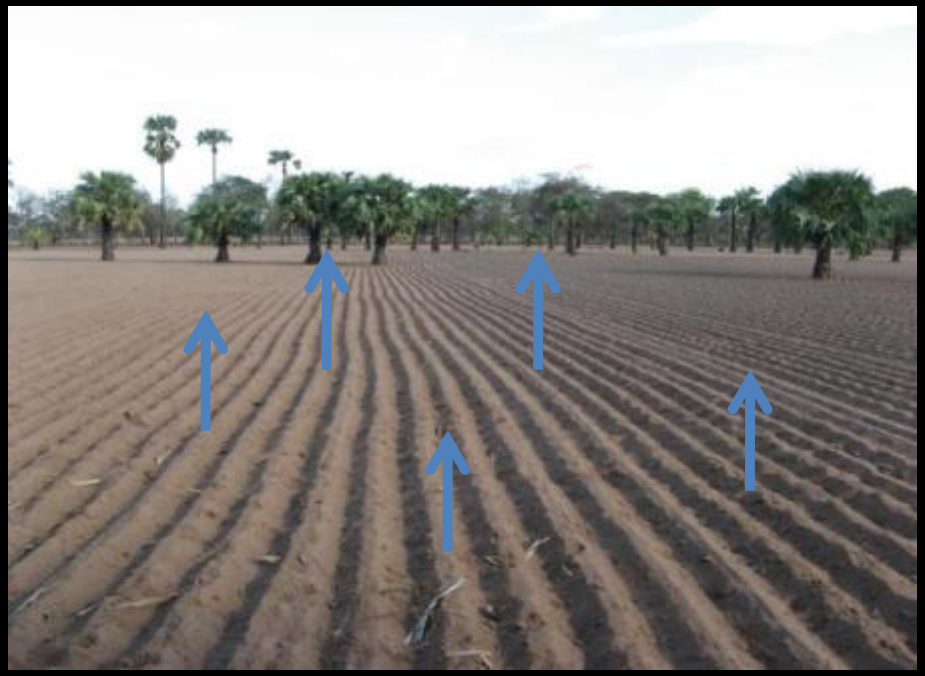
Apple of the Sahel

Annual, rain-fed agroforestry agriculture

Agroforestry

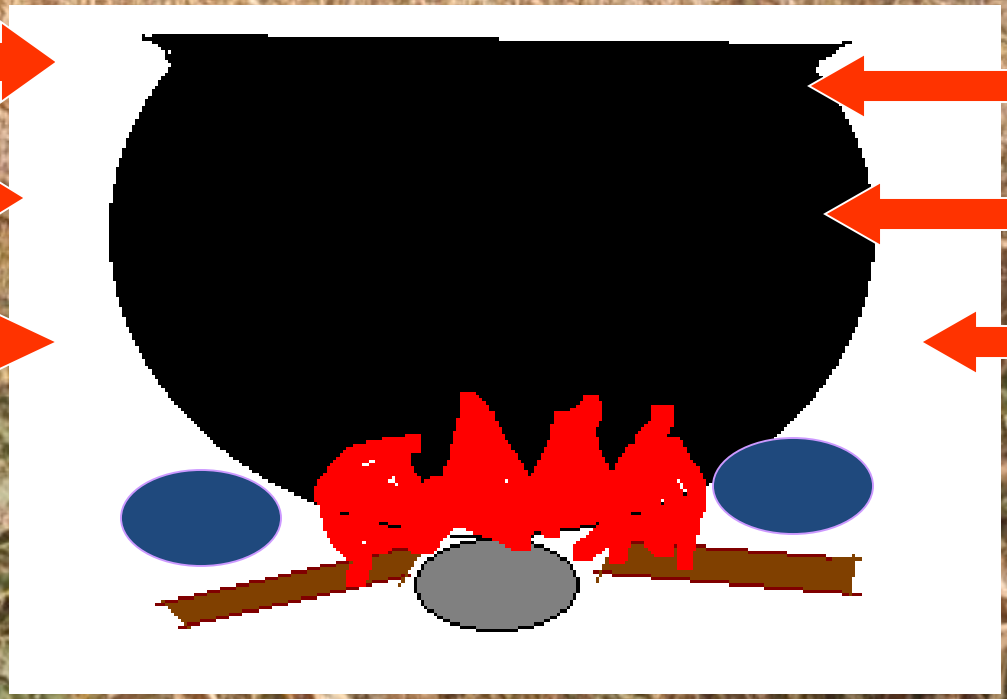
Water Cycle

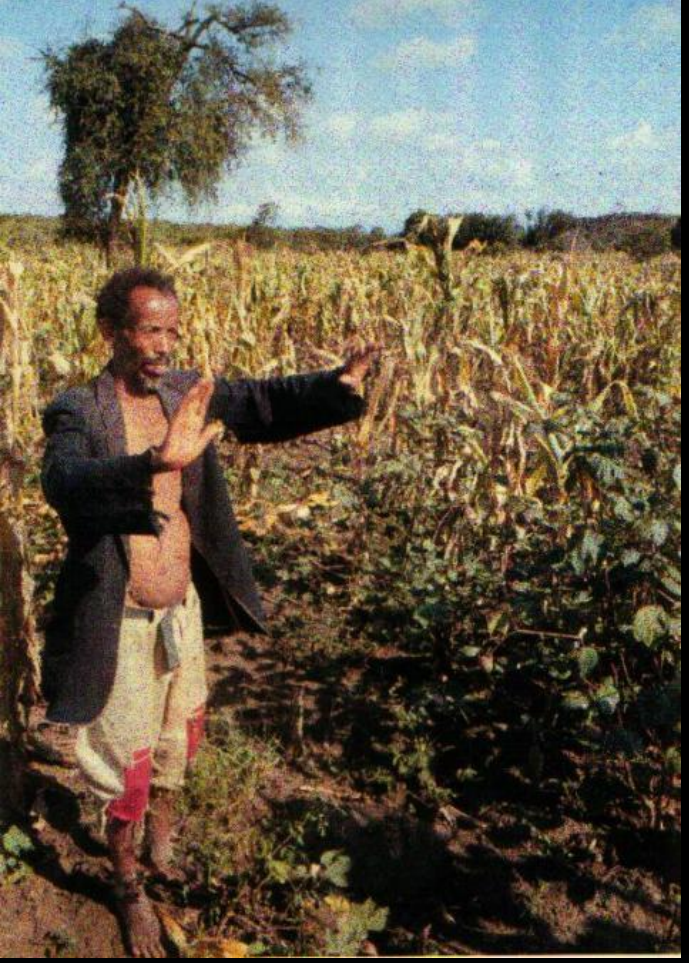

T=15-30%
R=100%
E=30-50%
S
Roff=10-25%
D = 10- 30%



Biodiversity

trying to balance a pot on a single stone!





Hungry again:

Southern Ethiopia.

Failed maize & sorghum crops.

Today, only 150 crops are cultivated, a sharp drop from the 10,000 used over time, and 3 grains-- maize, rice, and wheat + potatoes provide more than 50 % of human energy needs. 95% of the food eaten comes from only 30 species of plants.

Management of biodiversity

- enables farmers to benefit from 100% of the landscape instead of just 20-50%.

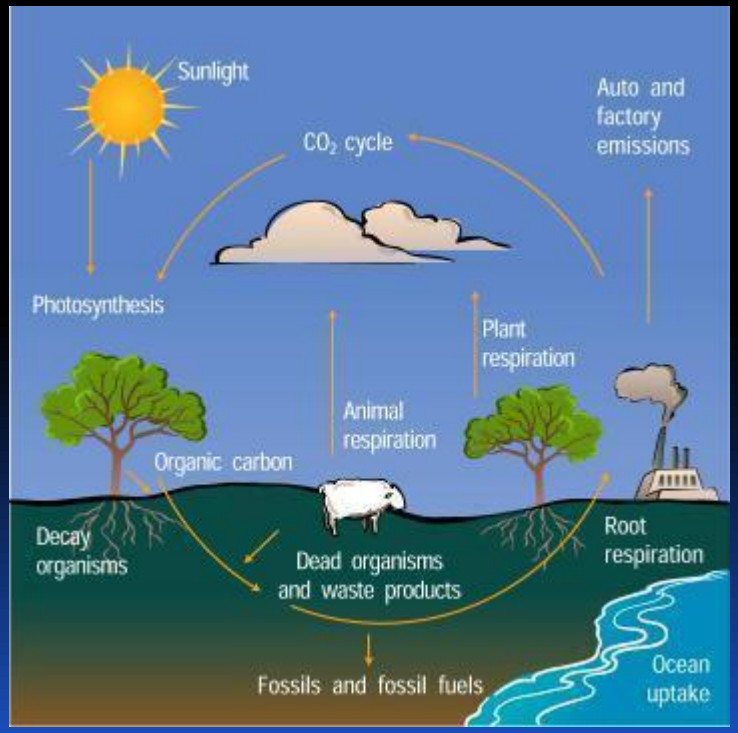
- enables farmers to be productive for 100% of the year, instead of just 25 – 50%

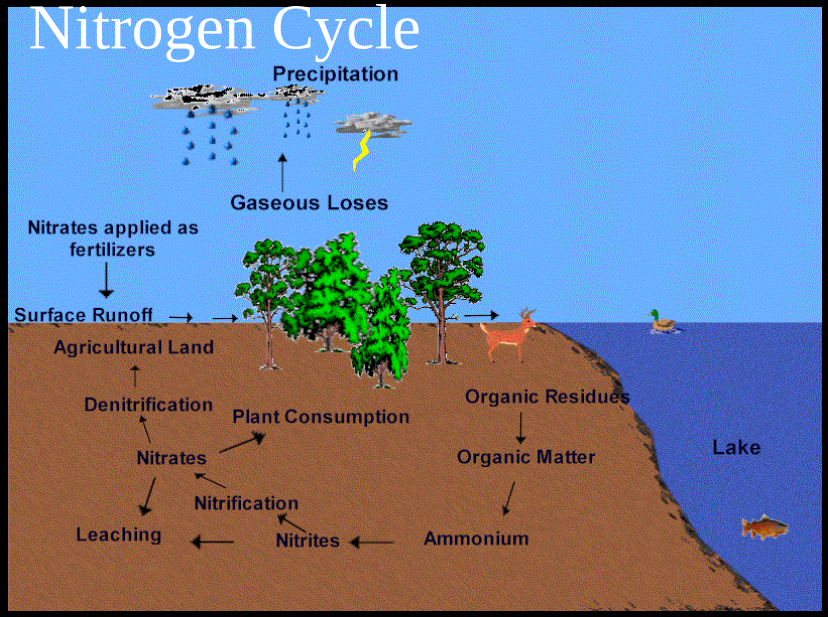
and

- enables farmers to continue being productive even in the face of environmental shocks such as drought, floods, severe storms and pest attack.

Nutrient Cycle

CO2 cycle





Living Soil

~1 gram of productive soil contains
~ 100 million - 1 billion bacteria.
~ 25,000 species of bacteria
~ 8,000 species of fungi.

Healthy soil behaves like a living organism. All life and sustenance comes from the soil. If we treat the soil with respect, we go a long way towards creating food security.

Nutrient Cycle

Mycorrhizal fungi ‘extend’ root capacity to access more water & nutrients.

Nodules housing nitrogen fixing bacteria on leguminous plant

Nitrogen – essential for plant and animal growth.
Atmosphere 78% Nitrogen but - Not available to plants


FOREST CHANGE
NASA active fires
Every year a belt of fire spreads across Central Africa, and as much as one-third of Madagascar goes up in flames
[1]http://news.mongabay.com/2007/1029-madagascar.html
NASA active fire alerts
PAST WEEK
PAST 72 HOURS
PAST 48 HOURS
globalforestwatch.org
WORLD RESOURCES INSTITUTE

Why is that child hungry?

From a natural resource management perspective, that child is poor because her life support system, the environment, has been damaged. It cannot provide abundantly, as it was created to.

That child is poor because only 50% of the land is converting sunlight energy to usable energy for 30% of the year, while 75% of the rainfall runs off or evaporates, 95% of the available biodiversity goes unused and 90% of the soils are infertile and biologically dead.

Fortunately, like God, the environment is very forgiving, and will give us a second chance – if we turn from our destructive ways and walk humbly with it.