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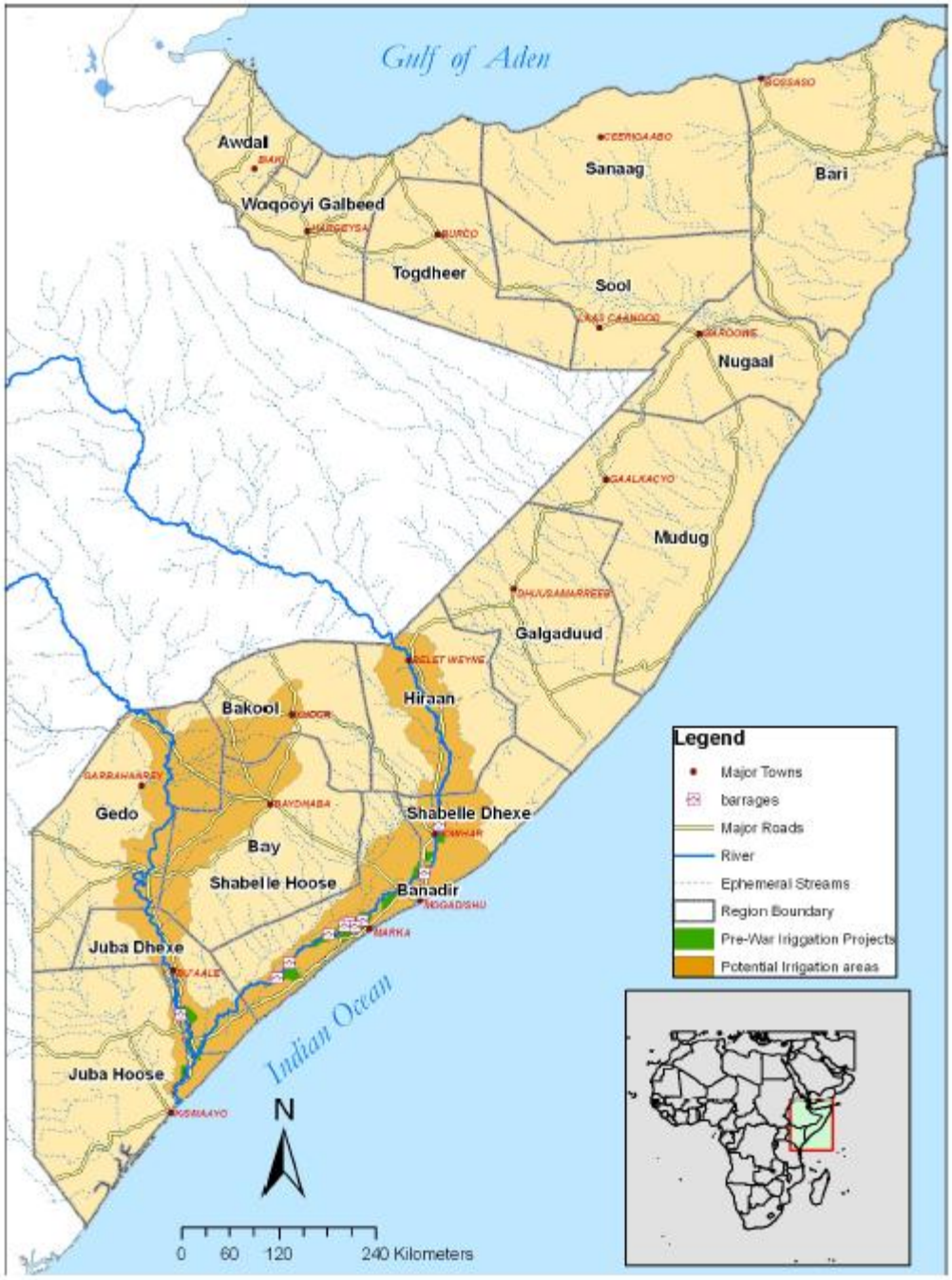
WINNER 2010
THE HUMANITARIAN WATER & FOOD AWARD

Permaculture in Somalia: Overview of Agroecological Natural Technology Systems (ANTS)

Compiled by T. Rhamis Kent for PRI Australia (rhamis_kent@yahoo.com)


Gulf of Aden
Awdal
Waqooyi Galbeed
Togdheer
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Bari
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Mudug
Galgaduud
Hiraan
Bakool
Gedo
Bay
Shabelle Hoose
Shabelle Dhexe
Banadir
Juba Dhexe
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Indian Ocean
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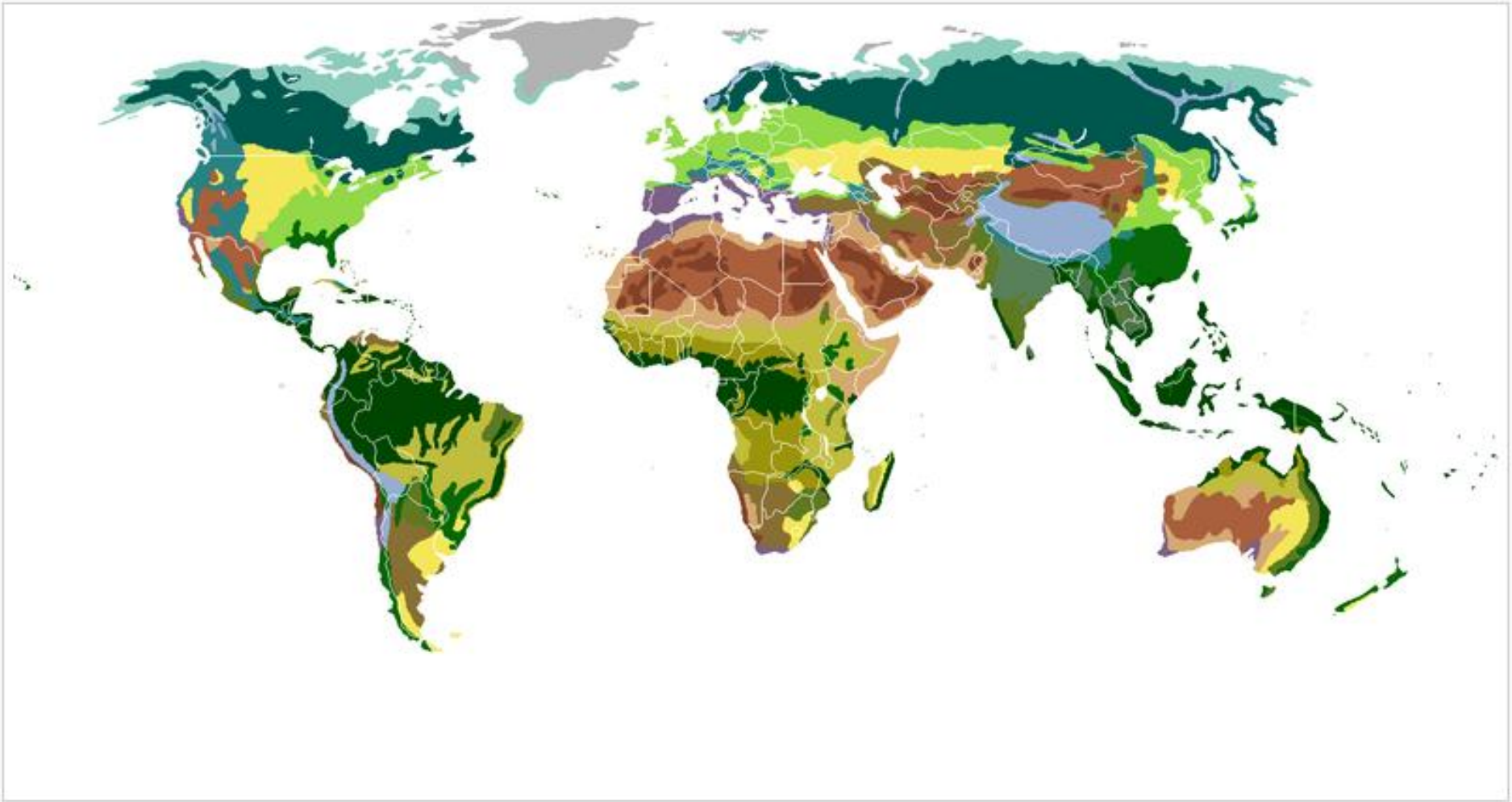

ice sheet & polar desert
tundra
taiga
temperate broadleaf forest
temperate steppe
subtropical rainforest
Mediterranean vegetation
monsoon forest
arid desert
xeric shrubland
dry steppe
semiarid desert
grass savanna
tree savanna
subtropical dry forest
tropical rainforest
alpine tundra
montane forest

Major threats facing the environment in Somalia include:

1. Burning of forests and the uprooting of mature trees for charcoal to be exported for hard currency.

2. Due to poor maintenance and fuel shortages for major water rig points that are now almost idle, nomads overpopulate areas with water wells & bore holes (etc.) leading to severe land degradation in those areas.

3. Lack of properly graded roads leads to truckers and private cars choosing to drive on virgin land leading to hundreds of kilometres of dead, dusty, and useless land. This also contributes to the creation of dry rivers and canyons that spoil pasture land.

4. Wildlife is poached without any mercy with most emigrating to neighbouring countries.

5. Lack of renewable energy sources results in heavy dependency on wood/charcoal for cooking.

Major threats facing the environment in Somalia include (cont.):

6. Heavy felling of trees by nomads for sheltering livestock. As 70% of Somalis are nomads following the rains, their constant movement increases the need for more shelters for both humans and livestock which in turn leads to more trees being felled.

7. Foreign industrial scale fishing fleets using seabed trawling nets.

8. The recently introduced habit of dumping nuclear and toxic waste on or close to Somalia's shores has been too slowly addressed.

9. Physical degradation that mainly refers to soil loss and erosion includes phenomena such as the deposition of undesirable sediments, deteriorating soil structure and increased stoniness.

NEWS

The unholy alliance in Somalia: Media, donors and aid agencies

SHARE BOOKMARK PRINT EMAIL RATING

Images of suffering such as these are hits with aid agencies. Picture: File

Somalia: the Real Causes of Famine

by Michel Chossudovsky

First published in 1993, *Third World Resurgence* and *Le Monde diplomatique*

The IMF Intervention in the Early 1980s

Somalia was a pastoral economy based on "exchange" between nomadic herdsmen and small agriculturalists. Nomadic pastoralists accounted for 50 percent of the population. In the 1970s, resettlement programs led to the development of a sizeable sector of commercial pastoralism. Livestock contributed to 80 percent of export earnings until 1983. Despite recurrent droughts, Somalia remained virtually self-sufficient in food until the 1970s.

The IMF-World Bank intervention in the early 1980s contributed to exacerbating the crisis of Somali agriculture. The economic reforms undermined the fragile exchange relationship between the "nomadic economy" and the "sedentary economy" - i.e. between pastoralists and small farmers characterized by money transactions as well as traditional barter. A very tight austerity program was imposed on the government largely to release the funds required to service Somalia's debt with the Paris Club. In fact, a large share of the external debt was held by the Washington-based financial institutions.' According to an ILO mission report:

> [T]he Fund alone among Somalia's major recipients of debt service payments, refuses to reschedule. (...) De facto it is helping to finance an adjustment program, one of whose major goals is to repay the IMF itself.

Towards the Destruction of Food Agriculture

The structural adjustment program reinforced Somalia's dependency on imported grain. From the mid-1970s to the mid-1980s, food aid increased fifteen-fold, at the rate of 31 percent per annum.' Combined with increased commercial imports, this influx of cheap surplus wheat and rice sold in the domestic market led to the displacement of local producers, as well as to a major shift in food consumption patterns to the detriment of traditional crops (maize and sorghum). The devaluation of the Somali shilling, imposed by the IMF in June 1981, was followed by periodic devaluations, leading to hikes in the prices of fuel, fertilizer and farm inputs. The impact on agricultural producers was immediate particularly in rain-fed agriculture, as well as in the areas of irrigated farming. Urban purchasing power declined dramatically, government extension programs were curtailed, infrastructure collapsed, the deregulation of the grain market and the influx of "food aid" led to the impoverishment of farming communities.'

Also, during this period, much of the best agricultural land was appropriated by bureaucrats, army officers and merchants with connections to the government.' Rather than promoting food production for the domestic market, the donors were encouraging the development of so-called "high value-added" fruits, vegetables, oilseeds and cotton for export on the best irrigated farmland.

Collapse of the Livestock Economy

As of the early 1980s, prices for imported livestock drugs increased as a result of the depreciation of the currency. The World Bank encouraged the exaction of user fees for veterinarian services to the nomadic herdsmen, including the vaccination of animals. A private market for veterinary drugs was promoted. The functions performed by the Ministry of Livestock were phased out, with the Veterinary Laboratory Services of the ministry to be fully

Foreign companies loot $350m from Somalia

AfricaNews

Muhyadin Ahmed Roble, AfricaNews reporter in Nairobi, Kenya
Friday, October 22, 2010

Foreign companies loot and dump toxic wastes in Somali seas in the full glare of the EU and NATO naval forces that patrol the Somali coastal lines, a Somali professor at the University of Minnesota has said.

Abdi Ismail Samater, a professor of Geography at the University of Minnesota claims foreign companies poach and dump toxic waste in Somali waters.

He said foreign interests seized the opportunity to begin looting the country's seafood after the collapse of the Somali government in 1991.

"Between 700 up to 800 illegal fishing ships directly steal Somali seafood. They took any kind of fish including nest eggs in the deep waters", he told AfricaNews in an exclusive interview.

He added that foreign ships use prohibited fishing equipment, including nets with very small mesh sizes and sophisticated underwater lighting systems, to lure fish to their traps.

Somalia waters have huge numbers of commercial fish species, including the prized yellow fin tuna.

The illegal fishing ships come from Italy, Egypt, India, South Korea, Kenya, Tanzania, and Spain, according to a research that is yet to be published by Prof. Abdi Ismail Samater and his colleagues at University of Minnesota.

The research also indicates that illegal fishing companies from Japan, China, Denmark and Holland are also part of the lootings process in Somalia.

MediaGlobal (New York)

Somalia: Charcoal Production Wreaks Environmental Havoc in Somalia

Amanda Wheat 9 June 2010

For centuries Somali culture has been shaped by the weather. Forecasters, called "Xidaars," are the most respected members of communities. Using an ancient combination of Persian and African astronomy to herald the rain and warn of oncoming drought, they define the crop and livestock cycles for pastorally based Somali communities. Although Somalis are no strangers to devastating droughts, uncertainty about weather patterns are rising with the temperature.

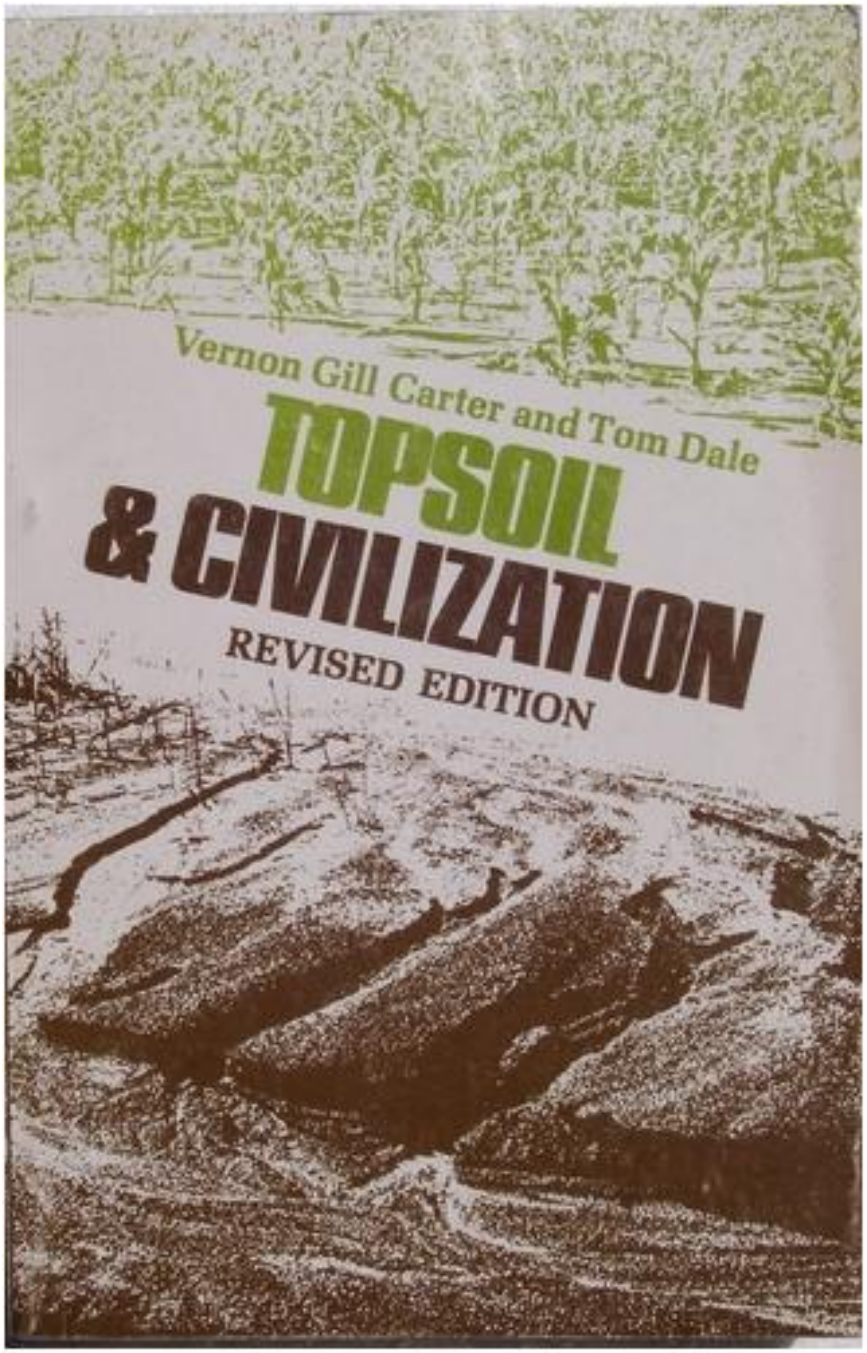
As the climate changes and crops dwindle, not only is the validity of these ancient practices questioned, many Somalis are forced to find alternate means of income. The result is an increase in charcoal production, which further compounds the degradation of Somalia's forests and livelihoods.

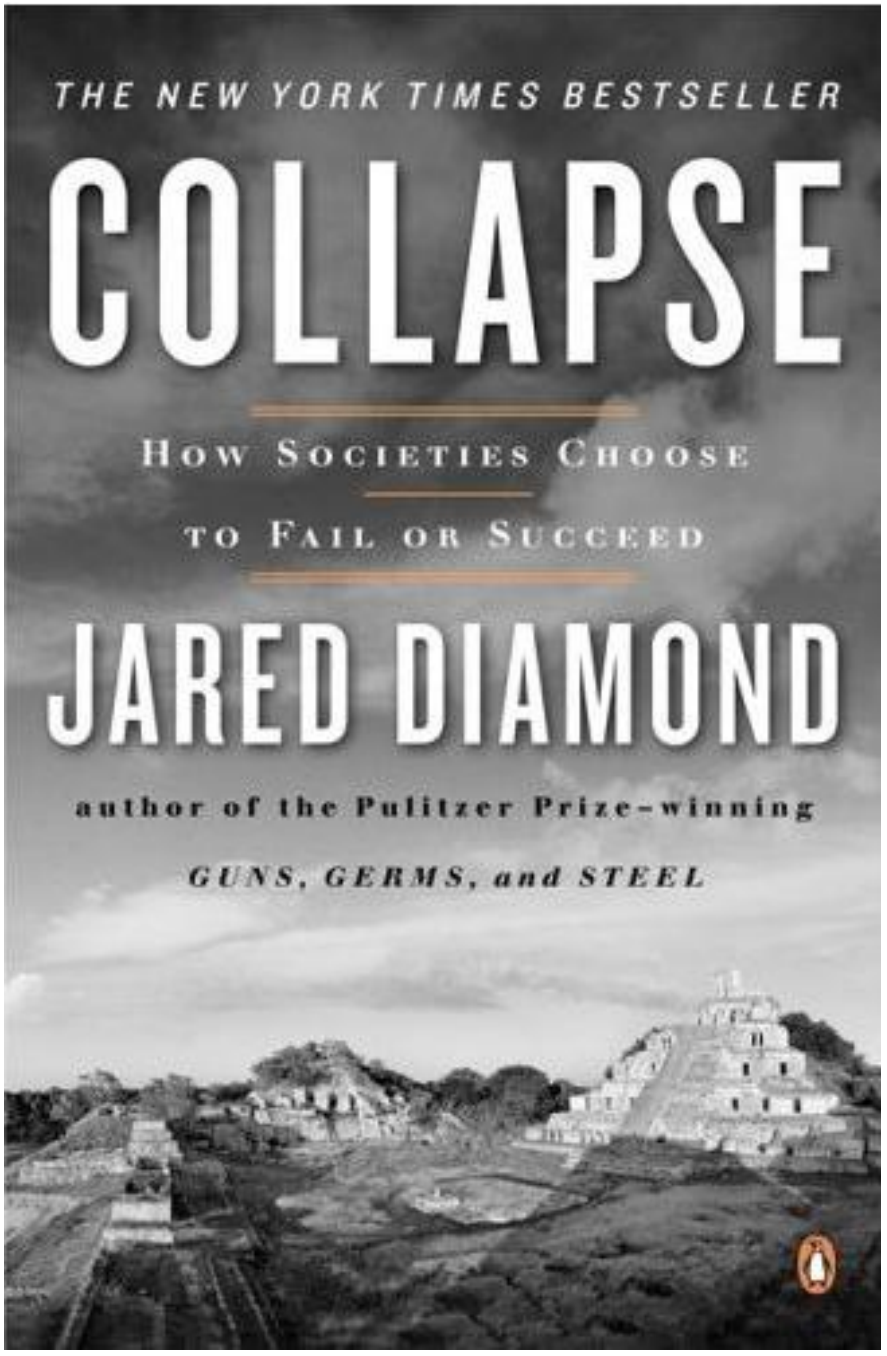
"Drought cycles in Somalia are becoming more frequent and rain is just erratic. It's getting warmer and warmer and [agricultural] production has fallen because crops can't produce with these unpredictable seasons," said Ahmed Awale, Executive Director of Candle Light for Health, Education and Environment.

Created in 1995 by a group of dedicated social workers; Candle Light is one of the most active non-profit organizations promoting sustainable practices in Somalia. With projects in forest revitalization and soil erosion, Candle Light serves as a key actor in Somalia's efforts to cope with climate change.

“- there are no economies without environments, but there are environments without economies.”

- The Economics of Ecosystems and Biodiversity (TEEB) Report


Vernon Gill Carter and Tom Dale
TOPSOIL
& CIVILIZATION
REVISED EDITION


THE NEW YORK TIMES BESTSELLER
COLLAPSE
How Societies Choose
to Fail or Succeed
JARED DIAMOND
author of the Pulitzer Prize-winning
GUNS, GERMS, and STEEL

Most Commonly Cited Causes of Civilizational Collapse (J. Diamond, V.G. Carter, Tom Dale)

1. *Deforestation & habitat destruction*

2. *Soil problems (such as erosion, salinization, and soil fertility losses)*

3. *Water management problems*

** All directly related to soil health*

“The most meaningful indicator for the health of the land, and the long term wealth of a nation, is whether soil is being formed or lost. If soil is being lost, so too is the economic and ecological foundation on which production and conservation are based.”

- Dr. Christine Jones, respected Australian Soil Scientist

UNEP

DEAD PLANET, LIVING PLANET

BIODIVERSITY AND ECOSYSTEM RESTORATION FOR SUSTAINABLE DEVELOPMENT

A RAPID RESPONSE ASSESSMENT

Investment Opportunities (cont.)

The Land = The Product

According to the UNEP report "Dead Planet, Living Planet: Biodiversity and Ecosystem Restoration for Sustainable Development"

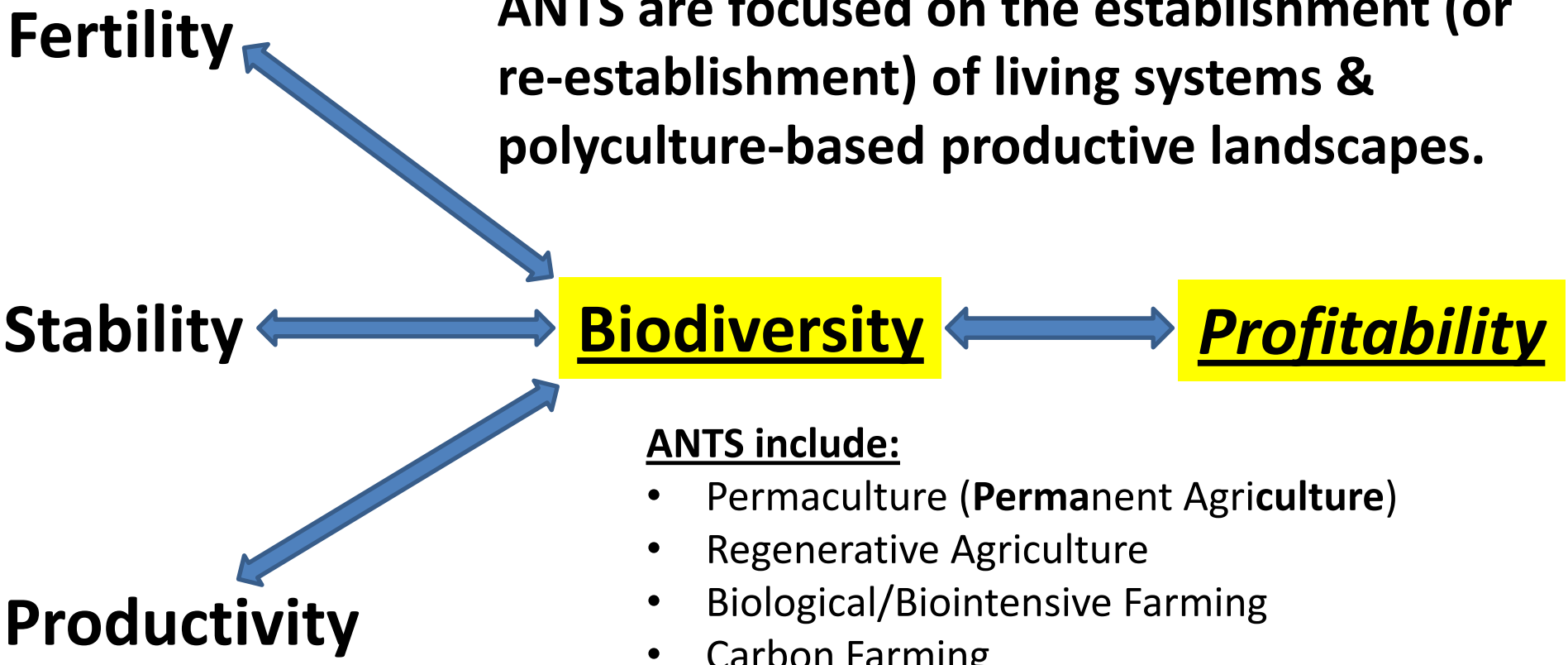
Ecosystem Restoration:

- ***Benefit/Cost Ratio = 3 – 75***
- ***Rate of Return = 7 – 79%***

Comparative Ecosystem Services Value (Organic VS. Conventional Agriculture):

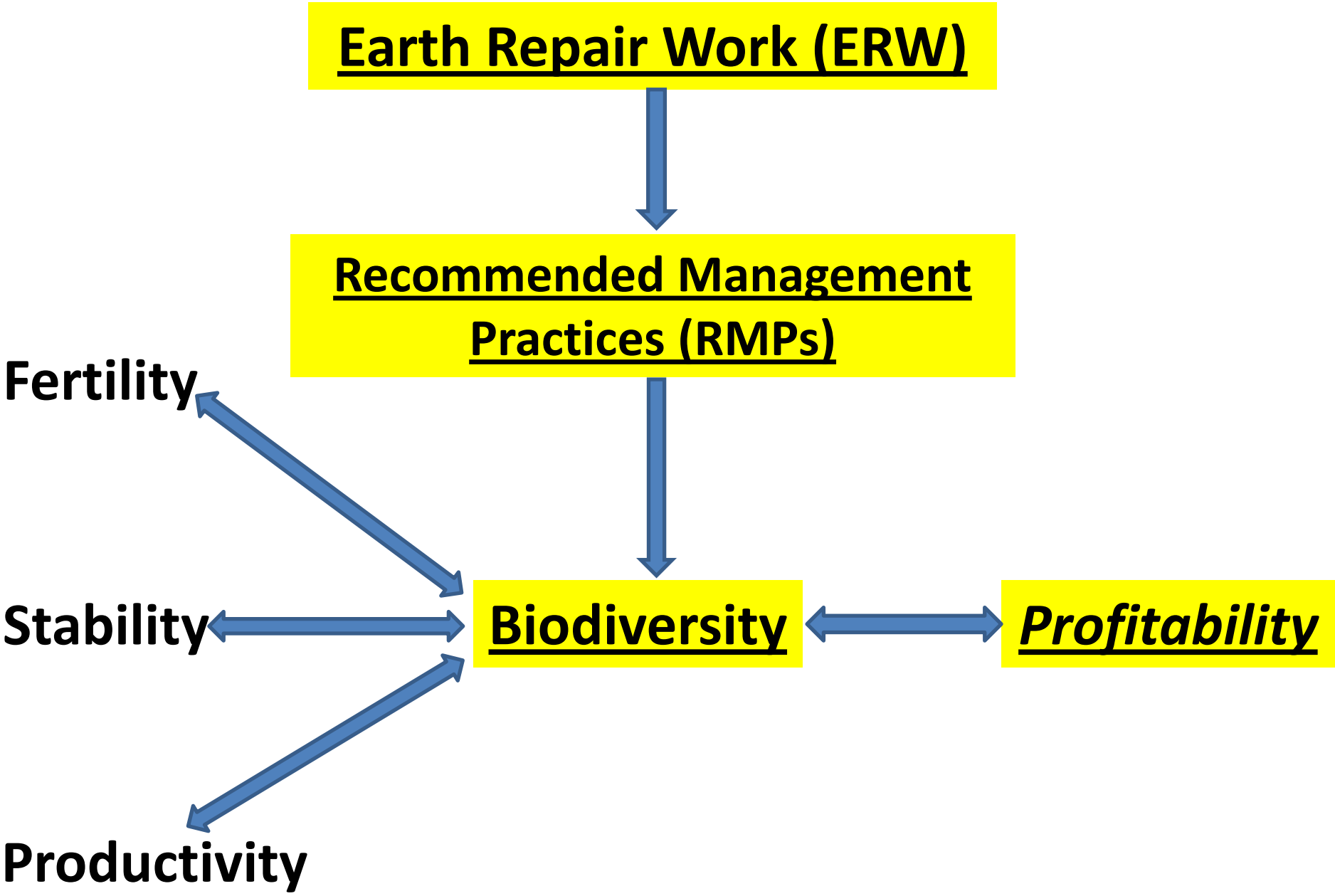
- ***Market value 21 – 25% higher for Organic***
- ***Non-market value 76 – 89% higher for Organic***

ANTS are focused on the establishment (or re-establishment) of living systems & polyculture-based productive landscapes.



ANTS include:

- Permaculture (**Perma**nent Agri**culture**)
- Regenerative Agriculture
- Biological/Biointensive Farming
- Carbon Farming
- Holistic Management
- Keyline Design
- Pasture Cropping/Silvopasture Systems
- Farmer Managed Natural Regeneration
- Biologically Active Compost/Compost Teas
- Water-harvesting Earthworks
- Bio/Myco/Phyto-Remediation


Earth Repair Work (ERW)
Recommended Management Practices (RMPs)
Fertility
Stability
Productivity
Biodiversity
Profitability

Land = Natural Resources = Ecosystem Services = Natural Capital Assets

Degraded Land/Loss of Ecosystem Services = Loss of Production Capacity

Loss of Production Capacity = Loss of Revenue/Profit

Global Environmental & Ecological Crisis

=

Symptom of Global Natural Capital Asset Mismanagement

Investment Opportunities

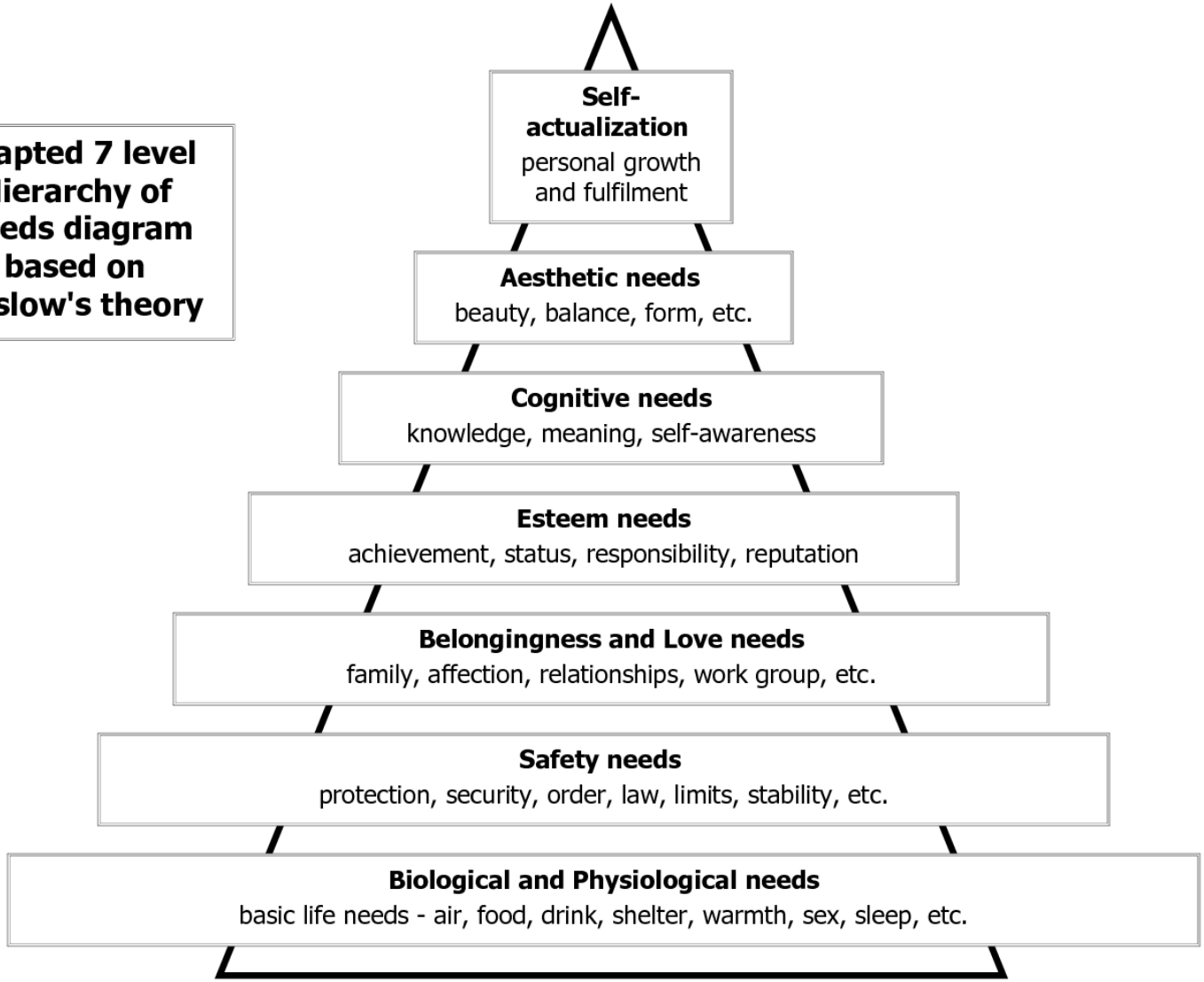
The Land = The Product

Imposed Scarcity

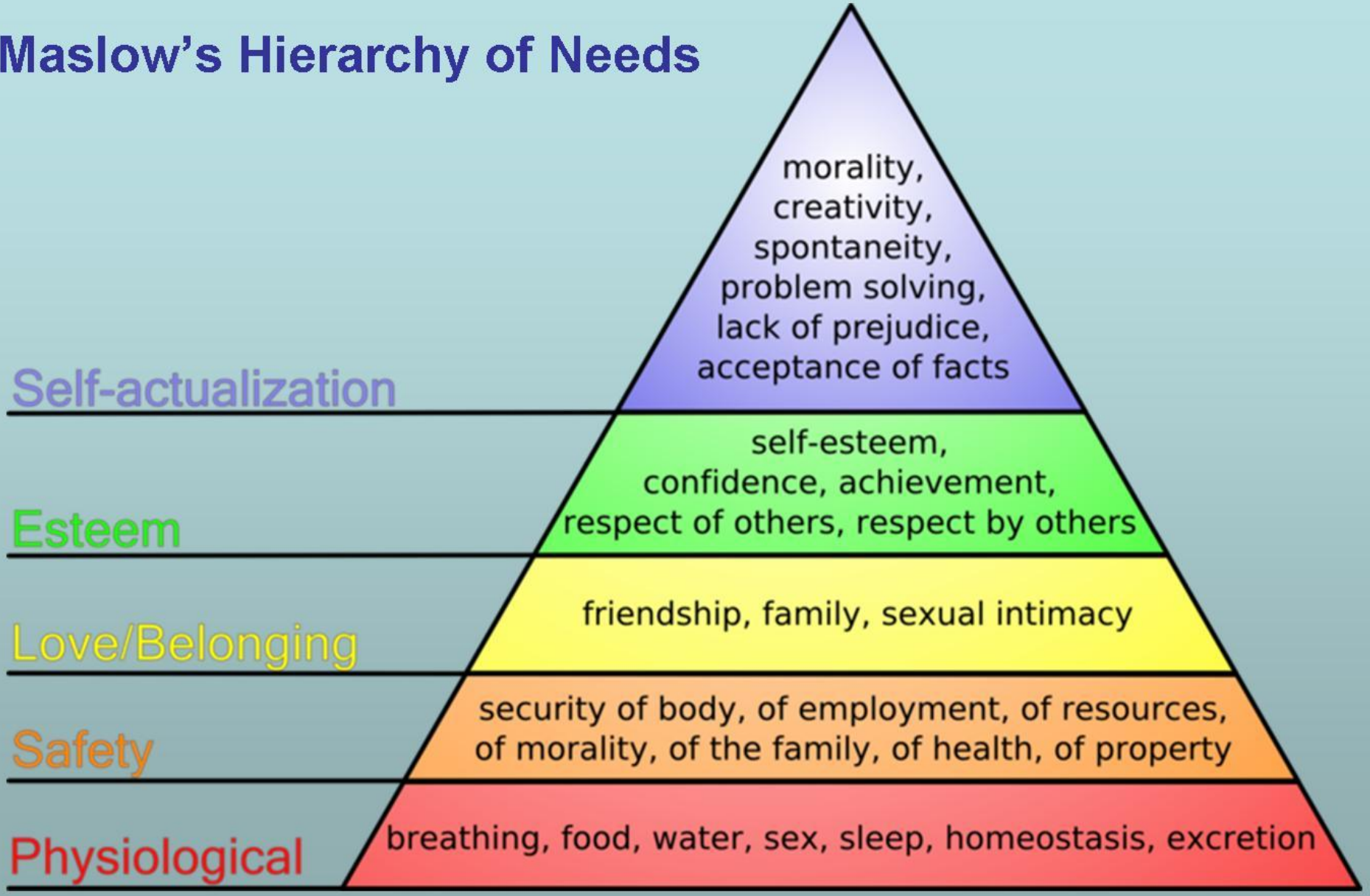
VS.

Effortless Abundance

Adapted 7 level Hierarchy of Needs diagram based on Maslow's theory



Maslow's Hierarchy of Needs



From: Wikipedia – Spring 2007

The Need for Sustainable Agriculture – It's So Obvious and Inevitable That Even The UN Has To Admit It

Biodiversity, **Consumerism**, **Deforestation**, **Food Shortages**, **Global Warming/Climate Change**, **Rehabilitation**, **Society**, **Soil Conservation**, **Soil Erosion & Contamination**, **Water Contaminaton**, **peak oil** — by **Rhamis Kent** February 25, 2011

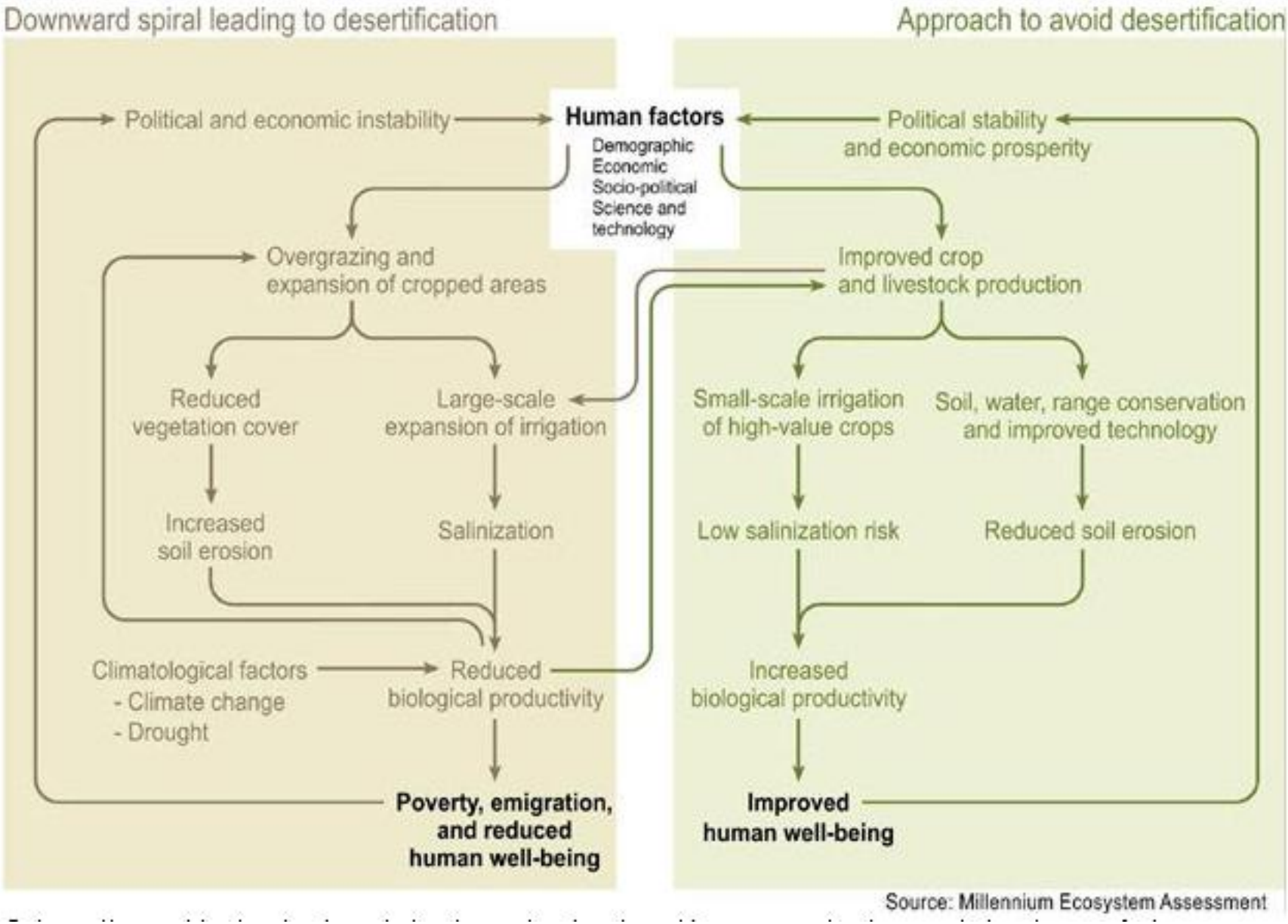
Editor's Note: *Quite some time ago, I shared the big 400-scientist-strong IAASTD worldwide study that concluded that small scale, localised, ecological agriculture was an imperative we cannot afford to ignore any more. The post was titled The Food Crisis: "A Perfect Storm" – and How to Turn the Tide. If you missed it, do check it out, and if you're already conversant in the multiple crises we're dealing with, then simply jump to the 'The Solutions' section. Now, halfway through 2010, whilst I had my head down, working on a tool to help fast track the aforementioned solution — www.permacultureglobal.com — yet another study shares the same holistic, science-based vision. Read on.*

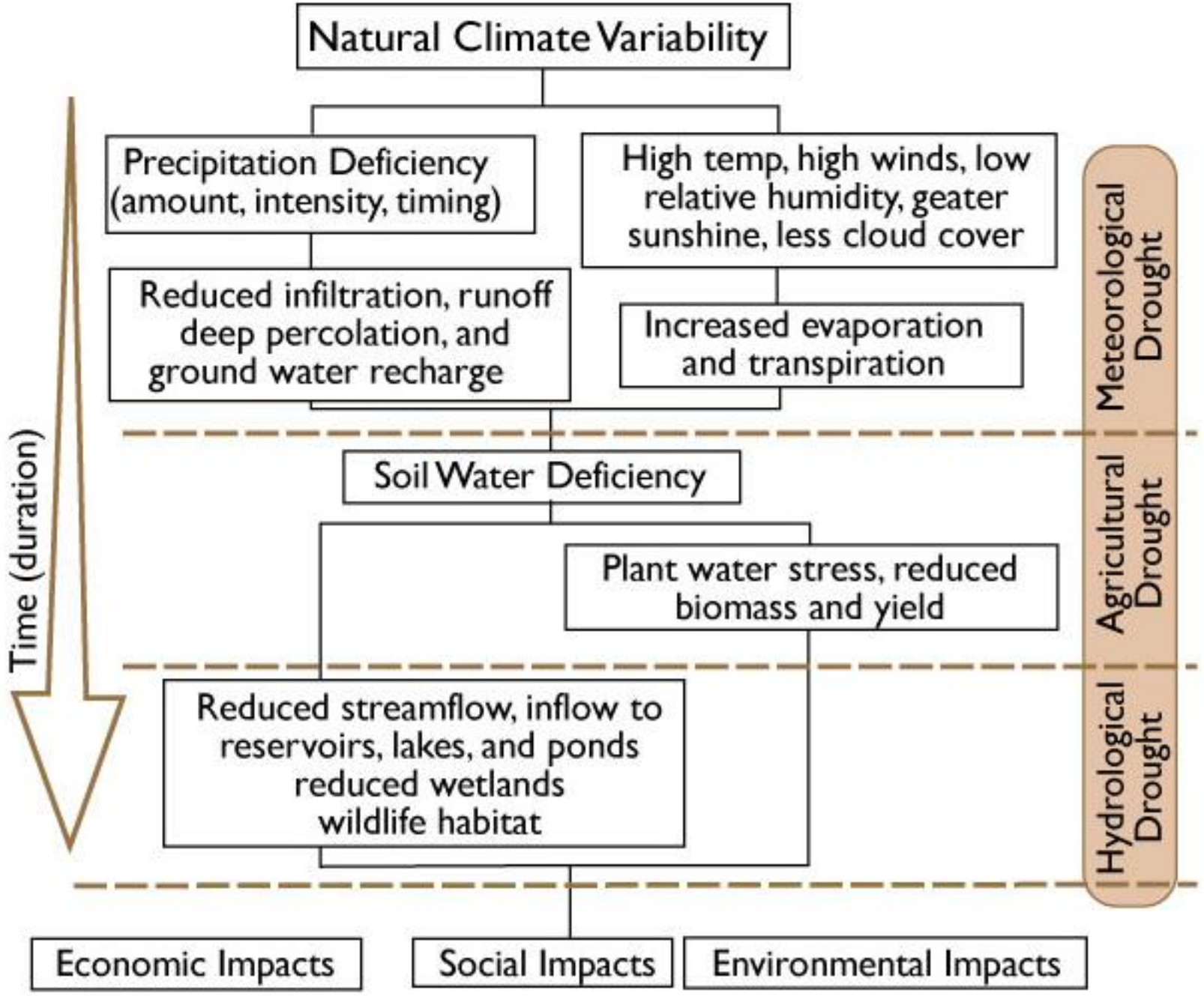
The great need to stop burning out our soils, wasting precious water, and polluting both, is no longer open to dispute. A rapid transition to sustainable methods of agriculture simply needs to be implemented on a massive scale — and it needs to be done yesterday.

This is the great task of our age.

> "Agroecology outperforms large-scale industrial farming for global food security," says UN expert. — *The United Nations Office at Geneva*

Ecosystems and Human Well-Being. Desertification Synthesis (United Nations)




Natural Climate Variability
Precipitation Deficiency (amount, intensity, timing)
High temp, high winds, low relative humidity, geater sunshine, less cloud cover
Reduced infiltration, runoff deep percolation, and ground water recharge
Increased evaporation and transpiration
Soil Water Deficiency
Plant water stress, reduced biomass and yield
Reduced streamflow, inflow to reservoirs, lakes, and ponds reduced wetlands wildlife habitat
Time (duration)
Meteorological Drought
Agricultural Drought
Hydrological Drought
Economic Impacts
Social Impacts
Environmental Impacts

"Research efforts in the soil science arena have concentrated on reducing the rate of soil loss. The concept of building new topsoil is rarely considered."

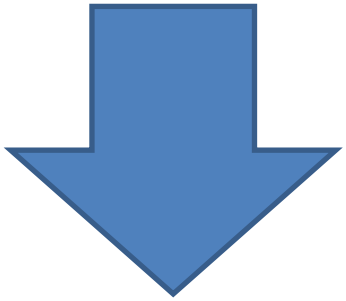
- Dr. Christine Jones, Australian Soil Scientist

Connection between Soil Organic Carbon & Water

Soil Organic Carbon (as humus) = Water holding capacity

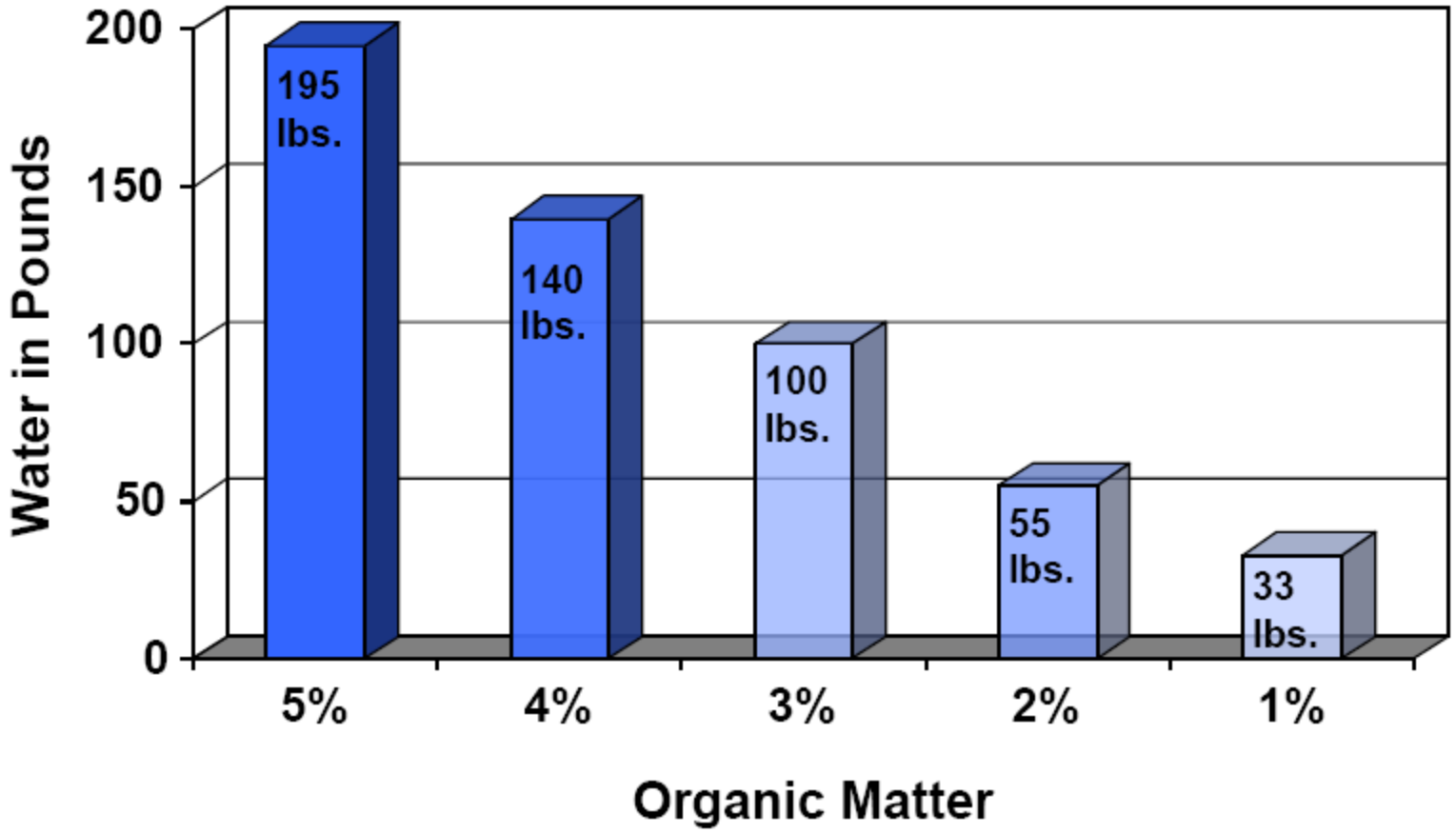
Every 1% increase in humus = storage of 168,000 litres of water per hectare

Most soil organic carbon levels have fallen 3% in absolute terms

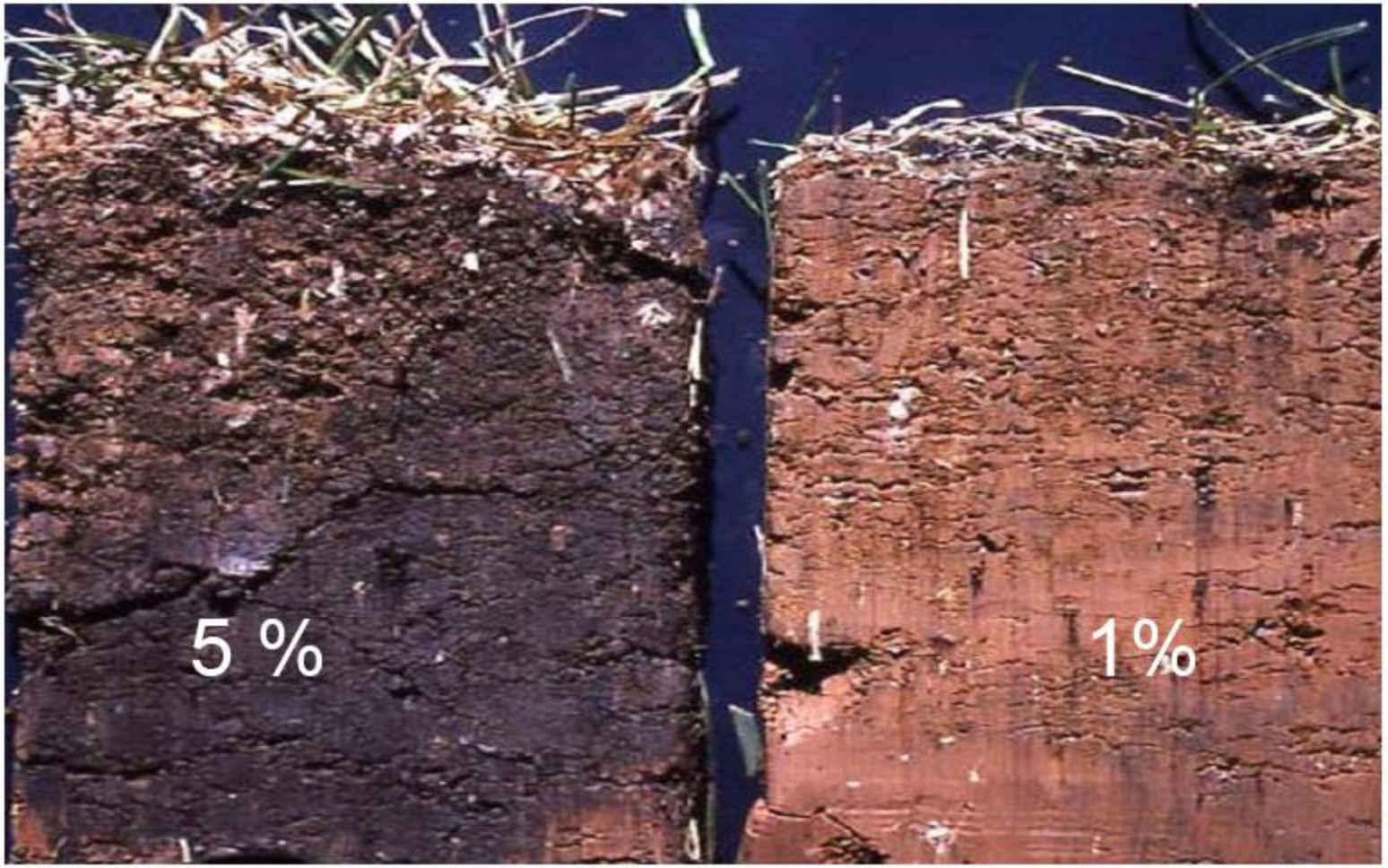


Represents a storage loss of 504,000 litres of water per hectare

Water Holding Capacity



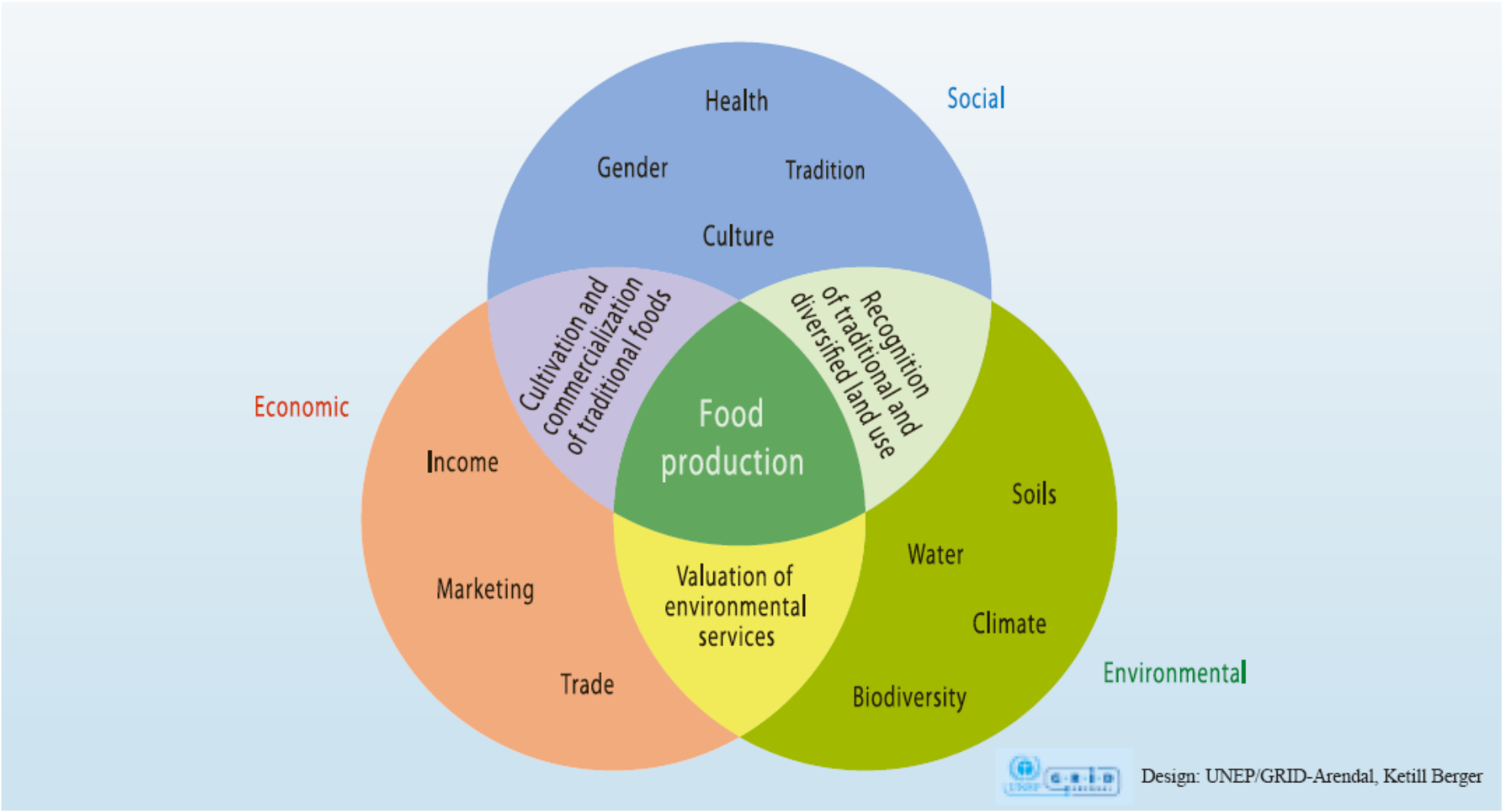
Soil Organic Matters



“Man's work with Nature that furthers Nature's aims is the work that rewards him the best.”

- The I Ching

The inescapable interconnectedness of agriculture's different roles



Moving Beyond Conservation to Regeneration Thinking

Conserving What Is Left

VS.

Regenerating What Has Been Lost

Example: The Loess Plateau Watershed Restoration Project

The Loess Plateau Watershed Rehabilitation Project (The World Bank International Development Agency)

Investment: ***$500,000,000 USD***

Area Covered: ***35,000 square kilometres (3.5 million hectares)***

Investment per unit area: ***$142.86 USD per hectare***

Results: ***More than 2.5 million people in four of China's poorest provinces – Shanxi, Shaanxi and Gansu, as well as the Inner Mongolia Autonomous Region – were lifted out of poverty.***

Through the introduction of sustainable farming practices, farmers' incomes doubled, employment diversified and the degraded environment was revitalized.

The projects' principles have been adopted and replicated widely. It is estimated that as many as 20 million people have benefited from the replication of the approach throughout China.

SITE UNSOILED

Peak soil is no joke: Civilization's foundation is eroding 22

BY Lester Brown
29 SEP 2010 9:13 AM

MORE: deforestation, Environmental Health, farming, Food, industrial ag

The thin layer of topsoil that covers the planet's land surface is the foundation of civilization. This soil, typically 6 inches or so deep, was formed over long stretches of geological time as new soil formation exceeded the natural rate of erosion. But sometime within the last century, as human and livestock populations expanded, soil erosion began to exceed new soil formation over large areas.

'THE SOIL IS BLEEDING'

New research: synthetic nitrogen destroys soil carbon, undermines soil health 20

BY Tom Philpott
23 FEB 2010 10:47 AM

MORE: agriculture, Climate & Energy, Food, industrial ag, nitrogen, organic food, Victual Reality

"Fertilizer is good for the father and bad for the sons."
--Dutch saying

Just precisely what does all of that nitrogen ferilizer *do* to the soil?

For all of its ecological baggage, synthetic nitrogen does one good deed for the environment: it helps build carbon in soil. At least, that's what scientists have assumed for decades.

If that were true, it would count as a major environmental benefit of synthetic N use. At a time of climate chaos and ever-growing global greenhouse gas emissions, anything that helps vast swaths of farmland sponge up carbon would be a stabilizing force. Moreover, carbon-rich soils store nutrients and have the potential to remain fertile over time--a boon for future generations.

Quoting Robert Shapiro, CEO of Monsanto:

"The commercial industrial technologies that are used in agriculture today to feed the world... are not inherently sustainable," Monsanto CEO Robert Shapiro told the Greenpeace Business Conference recently.

"They have not worked well to promote either self-sufficiency or food security in developing countries." Feeding the world sustainably "is out of the question with current agricultural practice," Shapiro told the Society of Environmental Journalists in 1995.

"Loss of topsoil, of salinity of soil as a result of irrigation, and ultimate reliance on petrochemicals ... are, obviously, not renewable. That clearly isn't sustainable."

Investment Opportunities (cont.)

Bloomberg

Arab World Needs $144 Billion to Meet Food Needs, Official Says

May 07, 2010, 12:07 PM EDT

By Wael Mahdi

May 7 (Bloomberg) -- Arab countries need to invest $144 billion in agriculture between now and 2030 to meet the demand for food for their growing populations, said an Arab official.

Arab states need to secure half of this amount from private investors to meet the demand of the combined population that is expected to reach 550 million in 2030, said Tareq al-Zadjali, director general of the Arab Organization for Agriculture Development in an interview in Jeddah this week.

Al-Zadjali said the gap in the Arab world will reach $71 billion in 2030 and without encouraging business to increase investment it can't be narrowed.

"The private investors need ready infrastructure and Arab countries need to develop that to attract them," he added. "I don't expect investors to build electricity stations, grains silos, and ports. This is the responsibility of governments."

MORE FROM BUSINESSWEEK

Telstra Says 'Significant Gap' in Government Talks (Update1)

China to Get First U.S. Trade Mission Under Obama (Update1)

German Stocks Rise; DAX Index Heads for Fourth Quarterly Gain

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STORY TOOLS

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Investment Opportunities (cont.)

African land grab not a cure to Arab food concerns

Wed Apr 7, 2010 12:25pm GMT

1 of 1 Full Size

By Dina Zayed

CAIRO (Reuters) - As desertification dries up farmland across the Arab world, the region's governments cannot remedy concerns about food security solely by looking to Africa for agricultural production, a regional expert said.

Desertification threatens 20 percent of the already dry Middle East and North Africa, pushing many states to invest in African farmland to feed growing populations, said Wadid Erian of the Arab Centre for the Studies of Arid Zones and Dry Lands.

Dwindling arable land and mounting food insecurity could exacerbate existing conflicts and deter investment in a region where economic marginalisation has long driven unrest.

"Desertification is creeping fast and our response needs to match the pace," Erian, who heads the centre's Land Resources Studies Program, said in a recent interview.

"The question we need to be asking is whether using (African) land is a sustainable long-term solution," he said.

Climate change, burgeoning populations and poor land management have contributed to accelerating desertification, exacerbating Arab countries' food supply problems. Across Arab states and Africa, Erian said, investment worth at least $60 billion is needed to secure sufficient food supplies.

GROWING POWER

Debunking the stubborn myth that only industrial ag can 'feed the world' 138

BY Tom Philpott
10 MAR 2011 6:00 AM

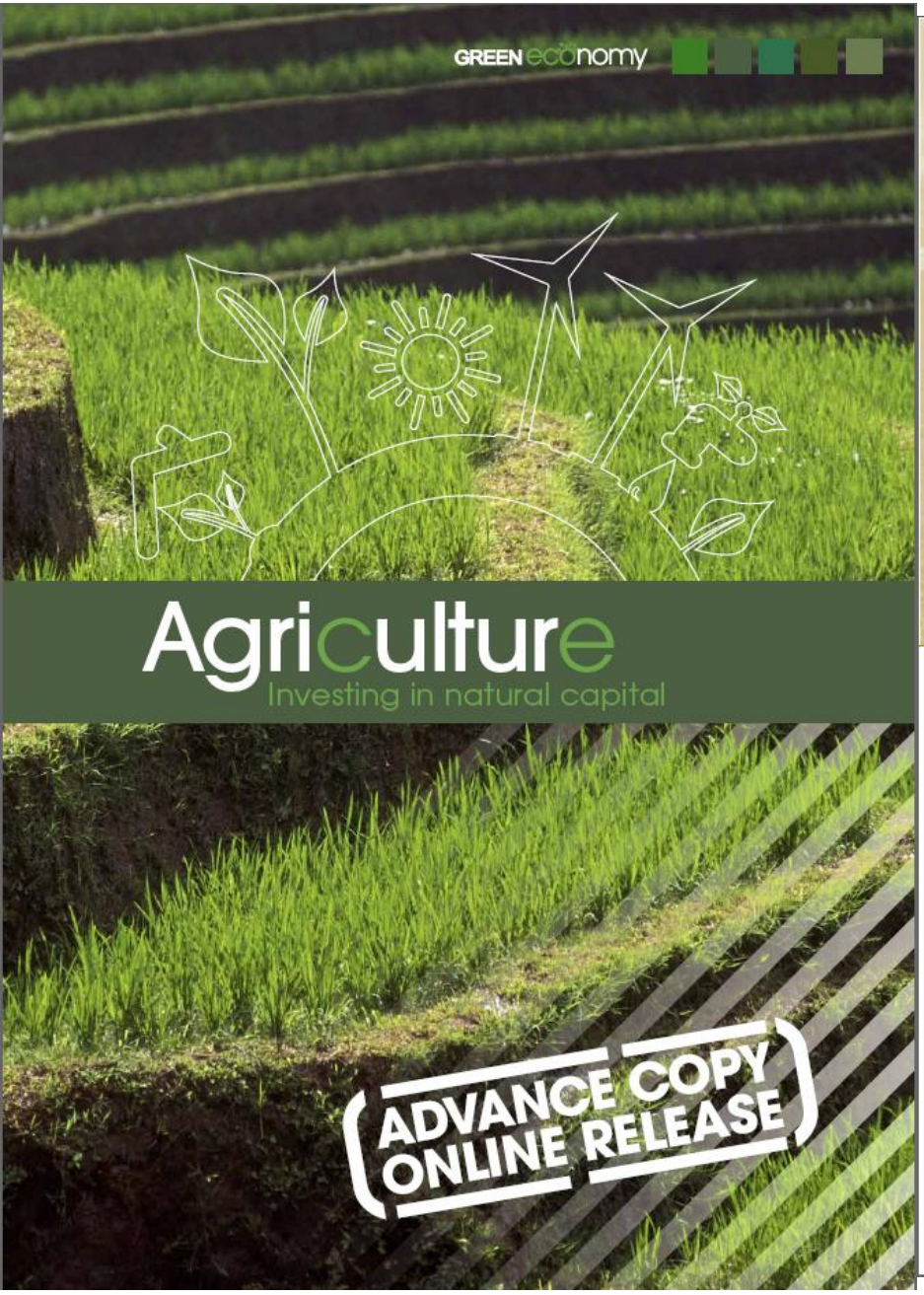
MORE: Food, industrial ag, organic food, Politics, Victual Reality

I've written about it once already, but I want to return to *The Economist's* recent special series about how industrial agriculture is the true and only way to feed the 9 billion people who will inhabit the world by 2050. The framing, I think, is extremely interesting.

Hold the agrichemicals: Organic ag could keep markets brimming with food.

The widely revered magazine identifies two strains of thought on the food system's future: one serious and one frivolous.

The serious one -- made up of "food companies, plant breeders, and international development agencies" -- is "concerned mainly with feeding the world's growing population," which it plans to do "through the spread of modern farming, plant research and food processing in poor countries."



THE RISE *and Predictable* FALL *of* GLOBALIZED INDUSTRIAL AGRICULTURE

A REPORT FROM
THE INTERNATIONAL FORUM
ON GLOBALIZATION

by Debbie Barker

Global food system must be transformed 'on industrial revolution scale'

The existing food system fails half the people on the planet, and needs radical change if world is to feed itself, report warns

Damian Carrington and **John Vidal**
guardian.co.uk, Monday 24 January 2011 15.57 GMT
Article history

The existing global food system is failing half the people on Earth, the report warns.

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Food · Farming · GM

Global development
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Related

7 Oct 2010
Farmers next to GM fields benefit from pest reduction, study shows

Right to Food: "Agroecology outperforms large-scale industrial farming for global food security," says UN expert

Olivier De Schutter, UN Special Rapporteur on the Right to Food

BRUSSELS (22 June 2010) – "Governments and international agencies urgently need to boost ecological farming techniques to increase food production and save the climate," said UN Special Rapporteur on the Right to Food, Olivier De Schutter, while presenting the findings at an international meeting on agroecology held in Brussels on 21 and 22 June.

Along with 25 of the world's most renowned experts on agroecology, the UN expert urged the international community to re-think current agricultural policies and build on the potential of agroecology.

"One year ago, Heads of States at the G20 gathering in Italy committed to mobilizing $22 billion over a period of three years to improve global food security. This was welcome news, but the most pressing issue regarding reinvestment in agriculture is not how much, but how," Olivier De Schutter said.

ORDER OF DEVELOPMENT PRIORITIES FOR PERMACULTURE PROJECTS (Physical Infrastructure)

1. Surveying
2. Earthworks
3. Water
4. Human presence (i.e. someone onsite)
5. Fence/Define & control border/Security
6. Perennial system initiation & establishment (food systems/food forest)
7. Establish and improve infrastructure (enough for Western presence – attracts material support)

World hunger best cured by small-scale agriculture: report

A move from industrial farming towards local food projects is our healthiest, most sustainable choice, says Worldwatch Institute

Nidhi Prakash
guardian.co.uk, Thursday 13 January 2011 12.00 GMT
Article history

Small is key ... school nutrition programmes and indigenous livestock preservation are excellent ways to encourage food security. Photograph: Graeme Robertson

Table 1: Farm Size versus Output in the United States, 1992

Median Farm Size Category (Acres)	*Average Gross Output ($/Acre)*	*Average Net Output ($/Acre)*
4	7424	1400
27	1050	139
58	552	82
82	396	60
116	322	53
158	299	55
198	269	53
238	274	56
359	270	54
694	249	51
1364	191	39
6709	63	12

Source: U.S. Agricultural Census, vol. 1, part 51, pp. 89-96, 1992.

Benefits of Using ANTS

For example, CSA (Community Supported Agriculture) operations routinely utilize RMPs.

"CSA may minimize some of the negative effects of more conventional systems of food production and distribution because it involves less chemical use, less soil erosion, less food packaging, fewer food miles and more crop and ecosystem diversity."

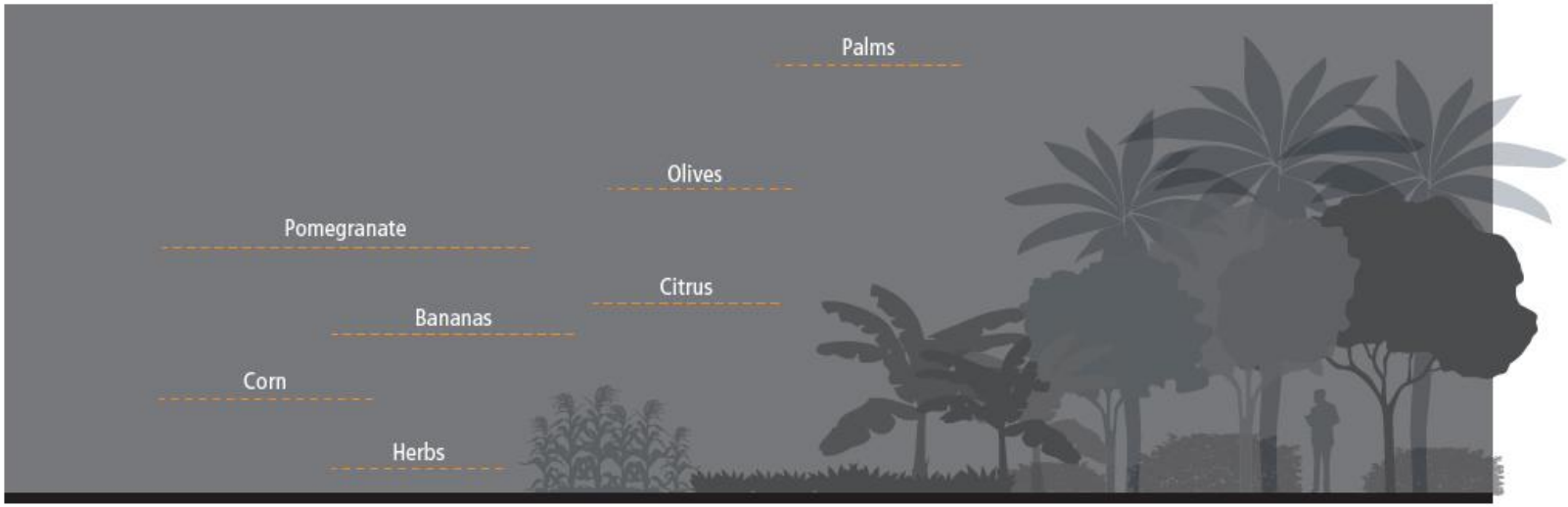
"***Average net return per acre for these CSA farmers is $2,467. This figure is quite high when compared to return per acre of corn ($172.11), soybeans ($134.46) and wheat ($38.10) in the United States.“ (USDA)***

Evolving a soil structure into a productive landscape




Permaculture
Sustainable Consultancy

Combining habitat, production + amenity



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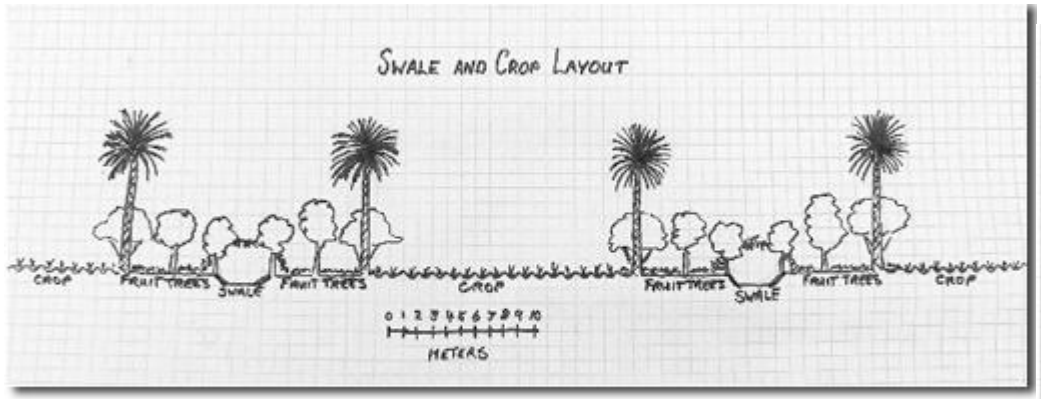
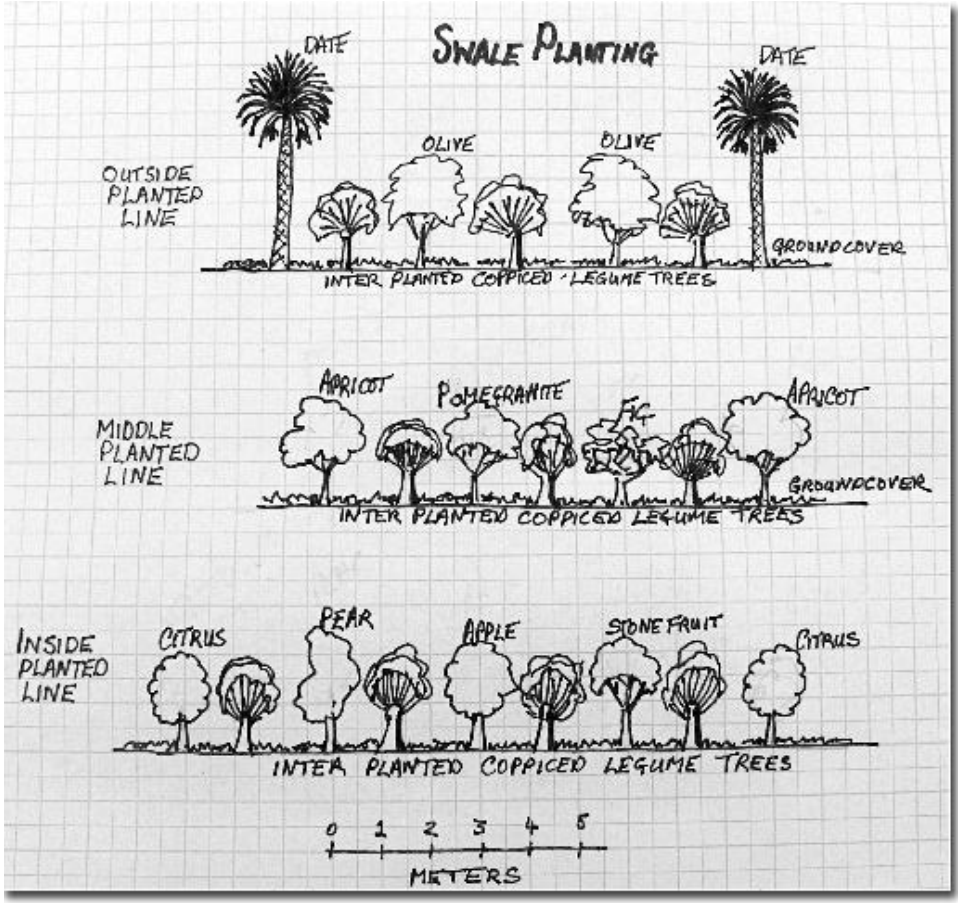
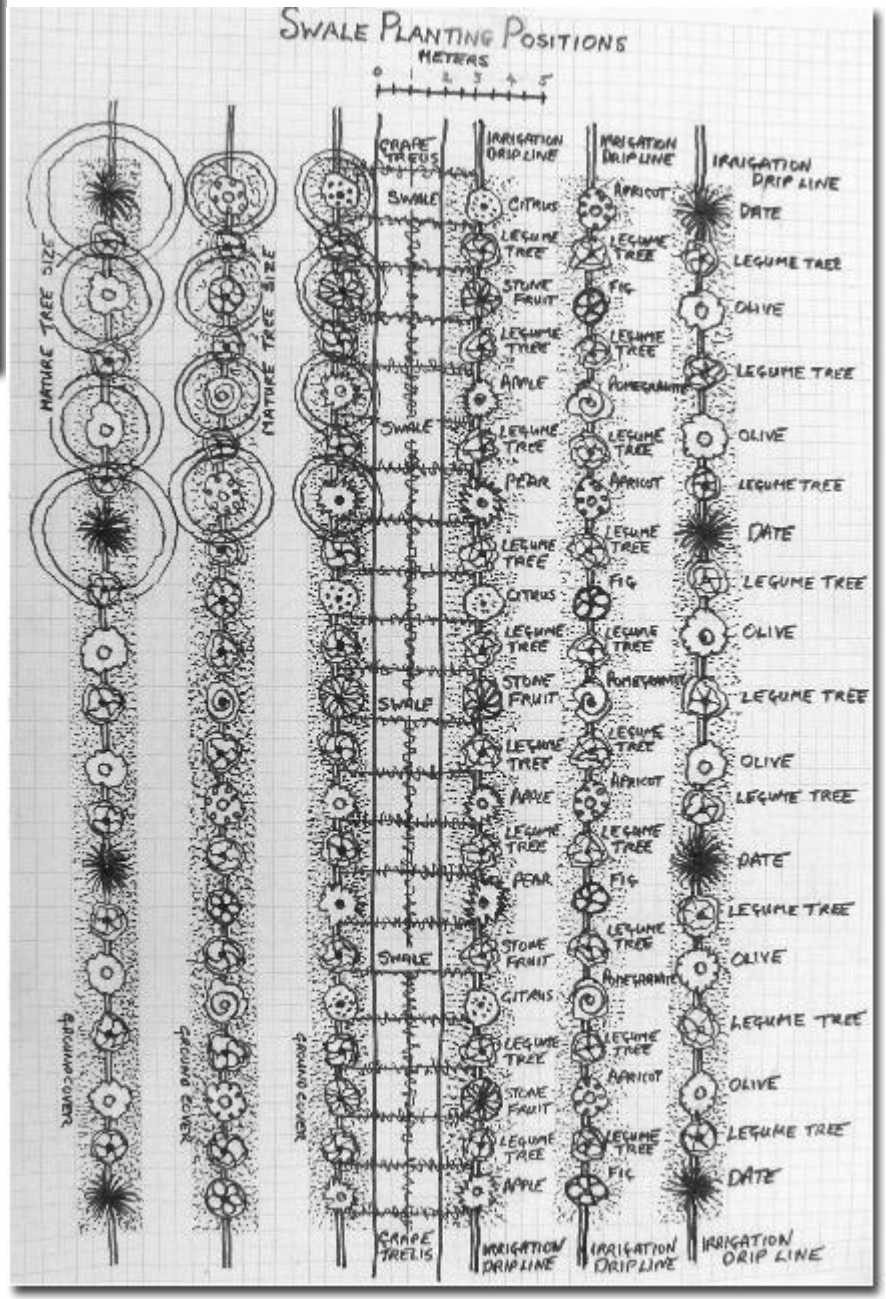


Alternating food forest/crop corridor profile
The crop is sheltered from sun and prevailing wind



Detail of the three lines of food forest trees on each side of swales



Aerial view of food forest section
A ~~river~~ trellised swale runs through it…

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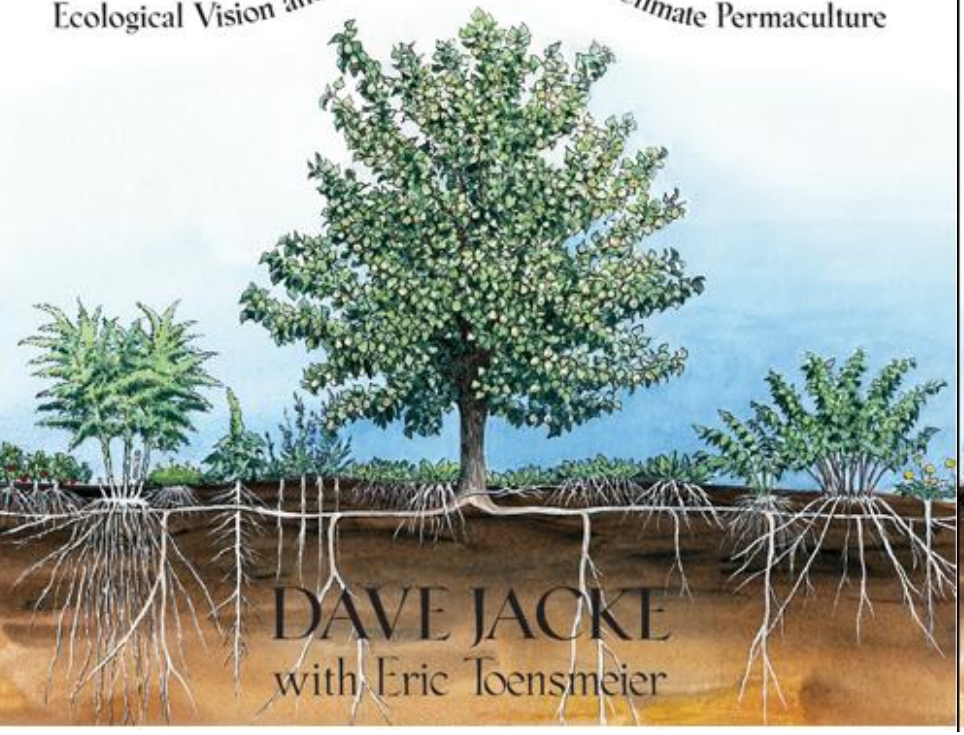

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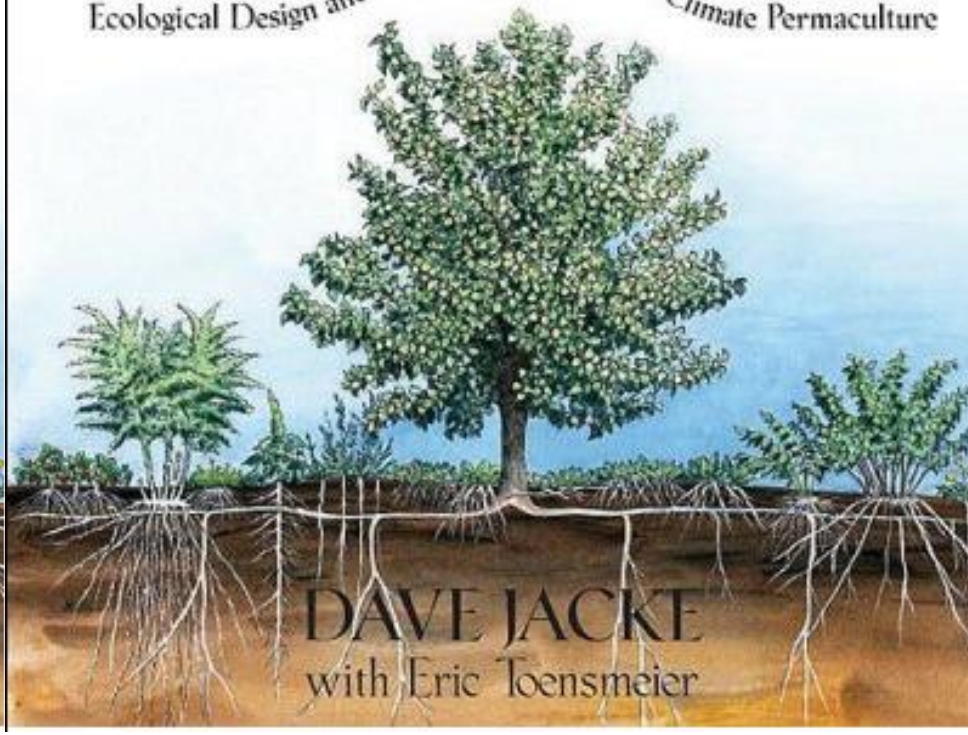

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Unique Acacia Tree's Promise To Revive African Soils

ScienceDaily (Aug. 26, 2009) — Scientists said at the 2nd World Congress of Agroforestry that a type of acacia tree with an unusual growth habit-unlike virtually all other trees-holds particular promise for farmers in Africa as a free source of nitrogen for their soils that could last generations.

With its nitrogen-fixing qualities, the tall, long-lived acacia tree, Faidherbia albida (Mgunga in Swahili) could limit the use of fertilizers; provide fodder for livestock, wood for construction and fuel wood, and medicine through its bark, as well as windbreaks and erosion control to farmers across sub-Saharan Africa. (Credit: Copyright World Agroforestry Centre (ICRAF))

See Also:

Plants & Animals
- Trees
- Botany
- Agriculture and Food

Earth & Climate
- Forest
- Acid Rain
- Exotic Species

Reference
- Organic farming methods
- Growth ring
- Sustainable agriculture
- Shifting cultivation

With its nitrogen-fixing qualities, the tall, long-lived acacia tree, Faidherbia albida (Mgunga in Swahili) could limit the use of fertilizers; provide fodder for livestock, wood for construction and fuel wood, and medicine through its bark, as well as windbreaks and erosion control to farmers across sub-Saharan Africa. The tree illustrates the benefits of growing trees on farms, said the scientists at today's meeting, and is adapted to an incredibly wide array of climates and soils from the deserts to the humid tropics.

"The future of trees is on farms," said Dennis Garrity, Director General of the World Agroforestry Centre, or

'Evergreen Agriculture' Boosts Crop Yields, Scientists Find

ScienceDaily (Nov. 2, 2010) — A unique acacia known as a "fertilizer tree" has typically led to a doubling or tripling of maize yields in smallholder agriculture in Zambia and Malawi, according to evidence presented at a conference in the Hague. The findings were central to the arguments of agroforestry experts at the conference, who urged decision makers to spread this technology more widely throughout the African nations most vulnerable to climate change and food shortages, and to think differently about more practical ways to solve the problems that are most pressing to smallholder farmers.

See Also:

Plants & Animals
- Agriculture and Food
- Trees
- Soil Types

Earth & Climate
- Sustainability
- Forest
- Global Warming

Speaking at The Hague Conference on Agriculture, Food Security and Climate Change, Dr. Dennis Garrity, Director General of the World Agroforestry Centre, said that evergreen agriculture -- or the integration of fertilizer trees into crop and livestock-holding farms -- is rapidly emerging as an affordable and accessible solution to improving production on Africa's farms.

Related Stories

Unique Acacia Tree's Promise To Revive African Soils (Aug. 26, 2009) — A type of acacia tree with an unusual growth habit -- unlike





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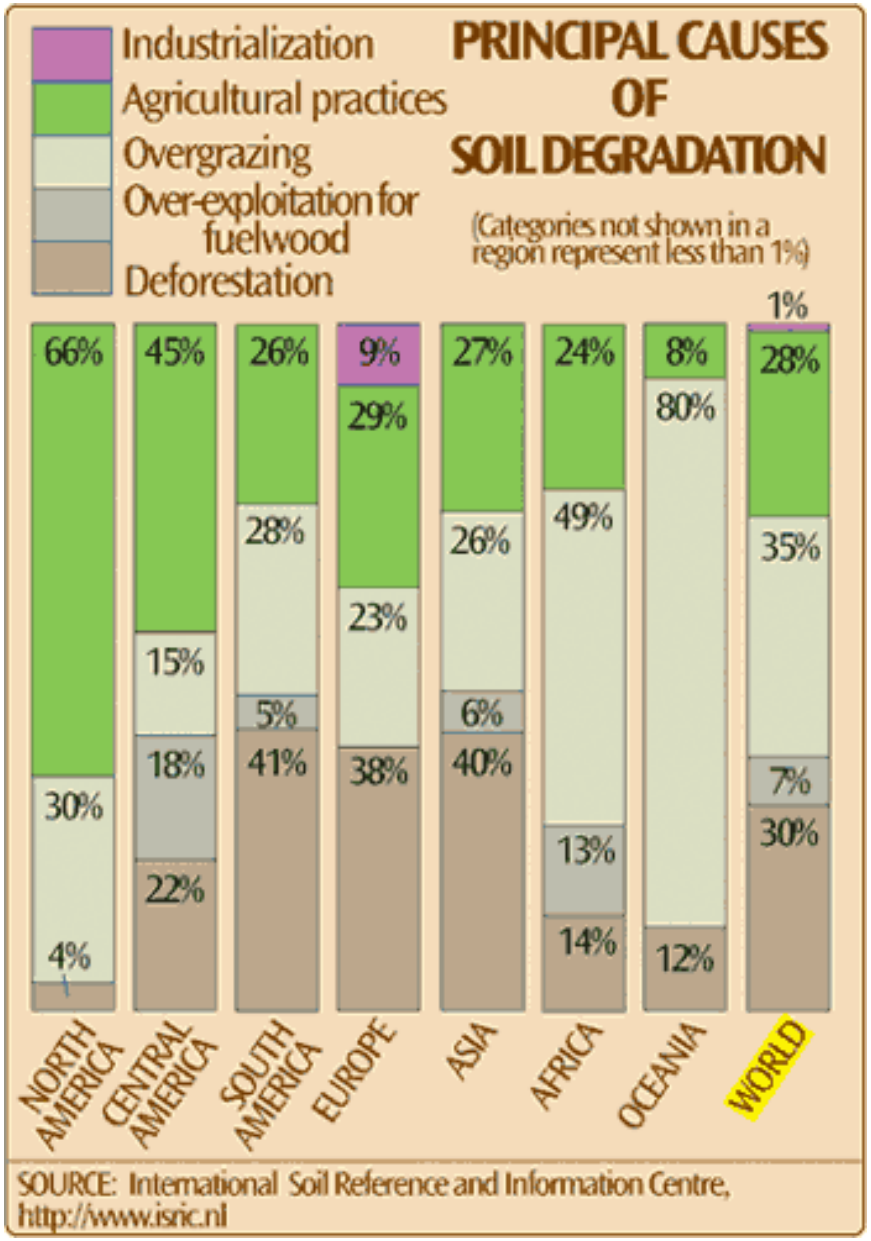
50% Cacao + Shade Species, Tree Crops & Cash Crops

Human-Induced Soil Degradation by Region & by Cause, 1945 to Late 1980's (WRI, UNEP)



World Totals (millions hectares):

Vegetation Removal = 579

Overexploitation = 133

Overgrazing = 679

Agricultural Activities = 522

Industrial & Bio-industrial = 23

1.936 Billion Hectares of Human-Induced Land Degradation Worldwide