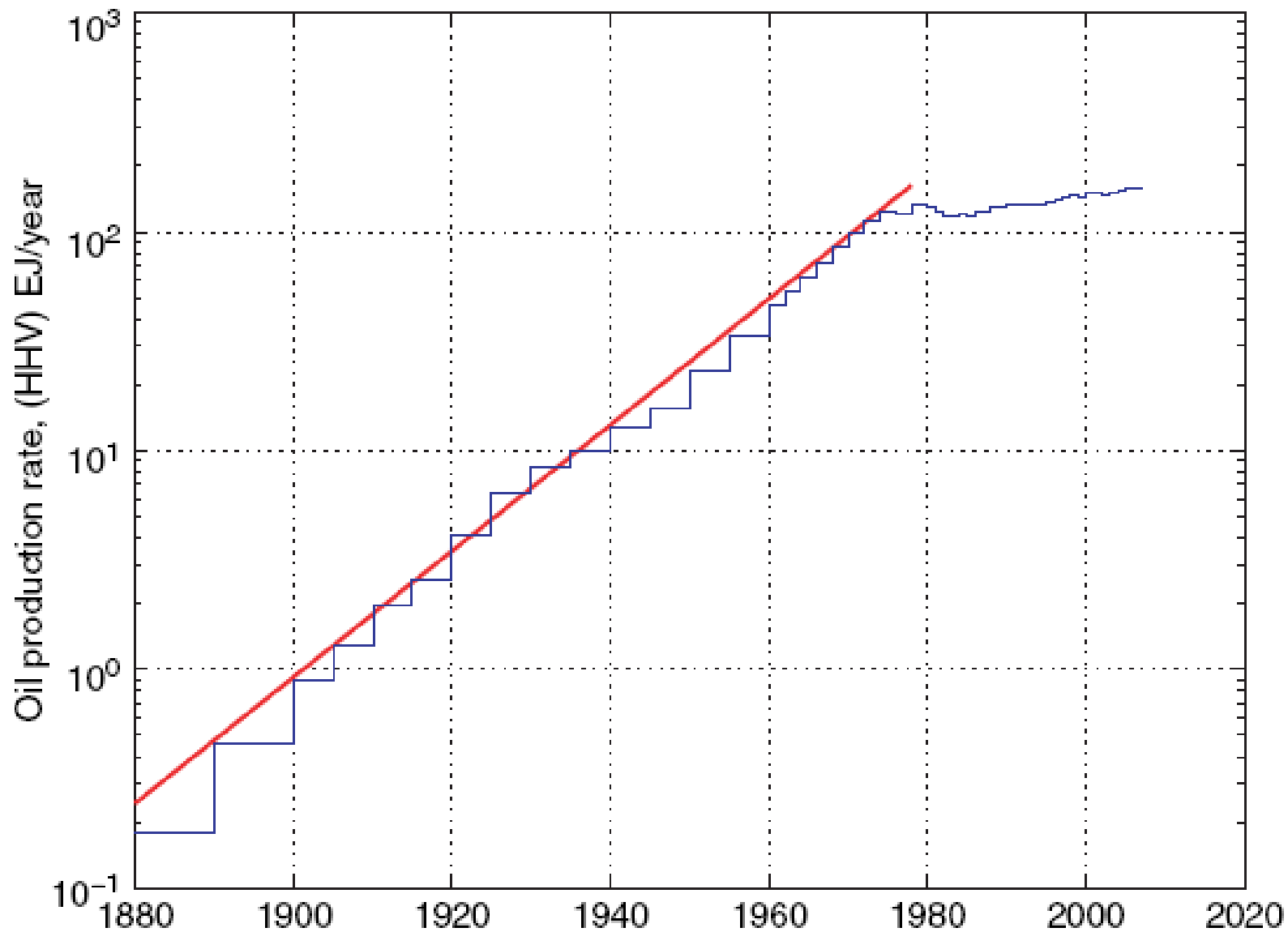
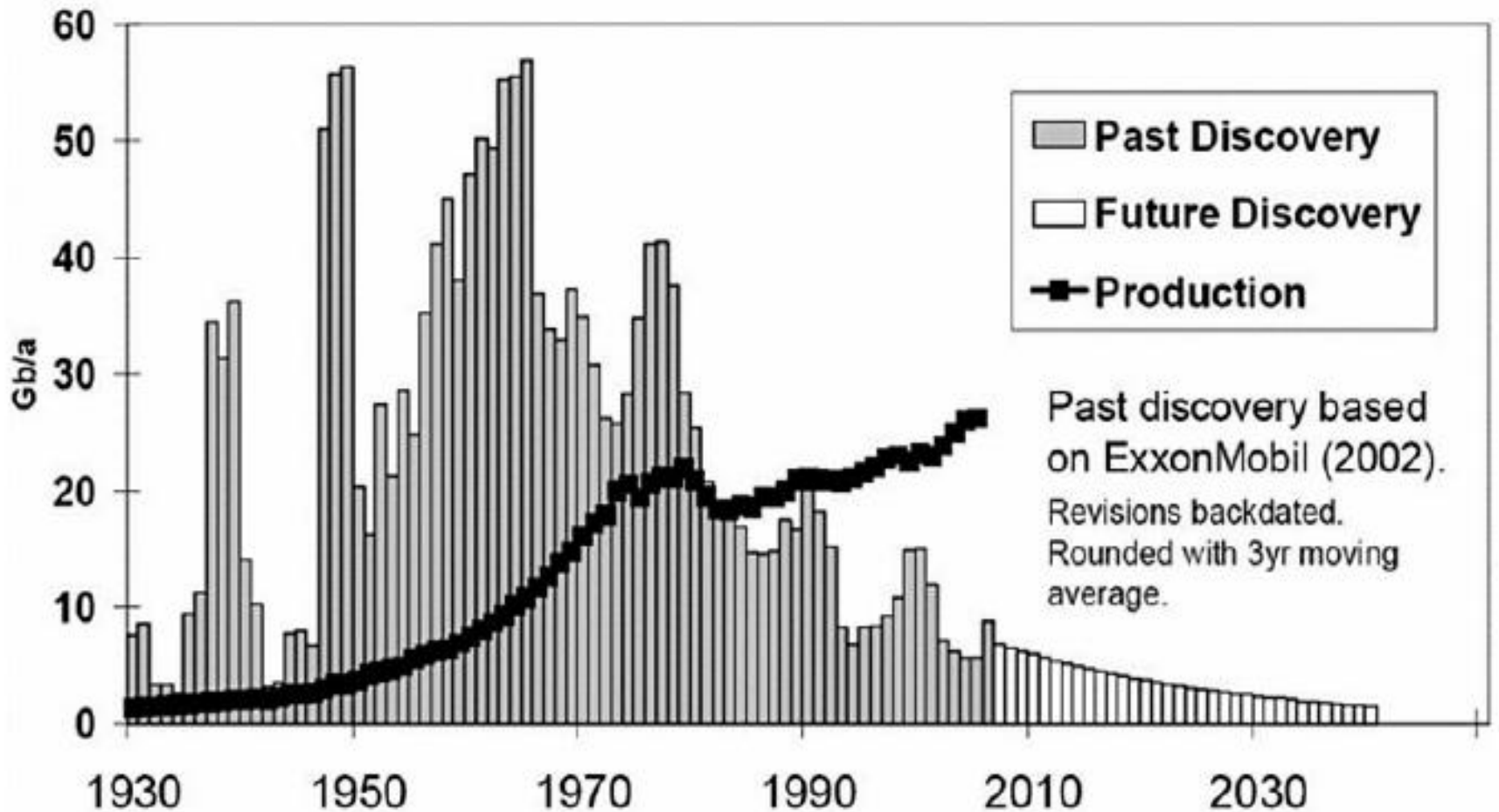


Sustainability, energy efficiency
and alternative energy; the new
global challenge



Note the exponential variation of oil production till 1980 and a near-leveling off



More of data - exponential growth of oil production and indications to growing gap If demand increases – this will be so because population is increasing and several countries are in “development” mode - partly due to exponential growth in population

Conclusion –

Sustainability demands that we
need to readjust living to availability

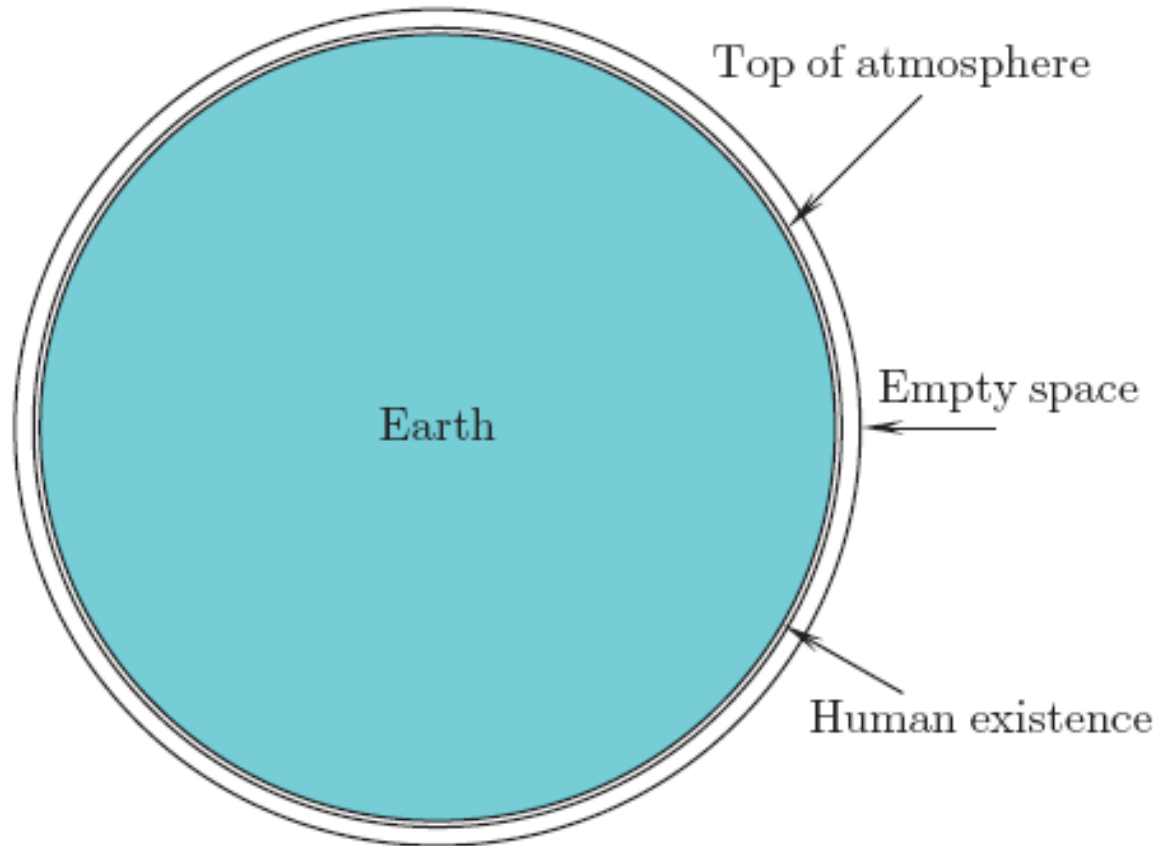
First route is to improve
energy efficiency (there can be really
no argument against it)

Alternate energy

- (1)SPV
- (2) Wind
- (3) Hydel
- (4) Biomass

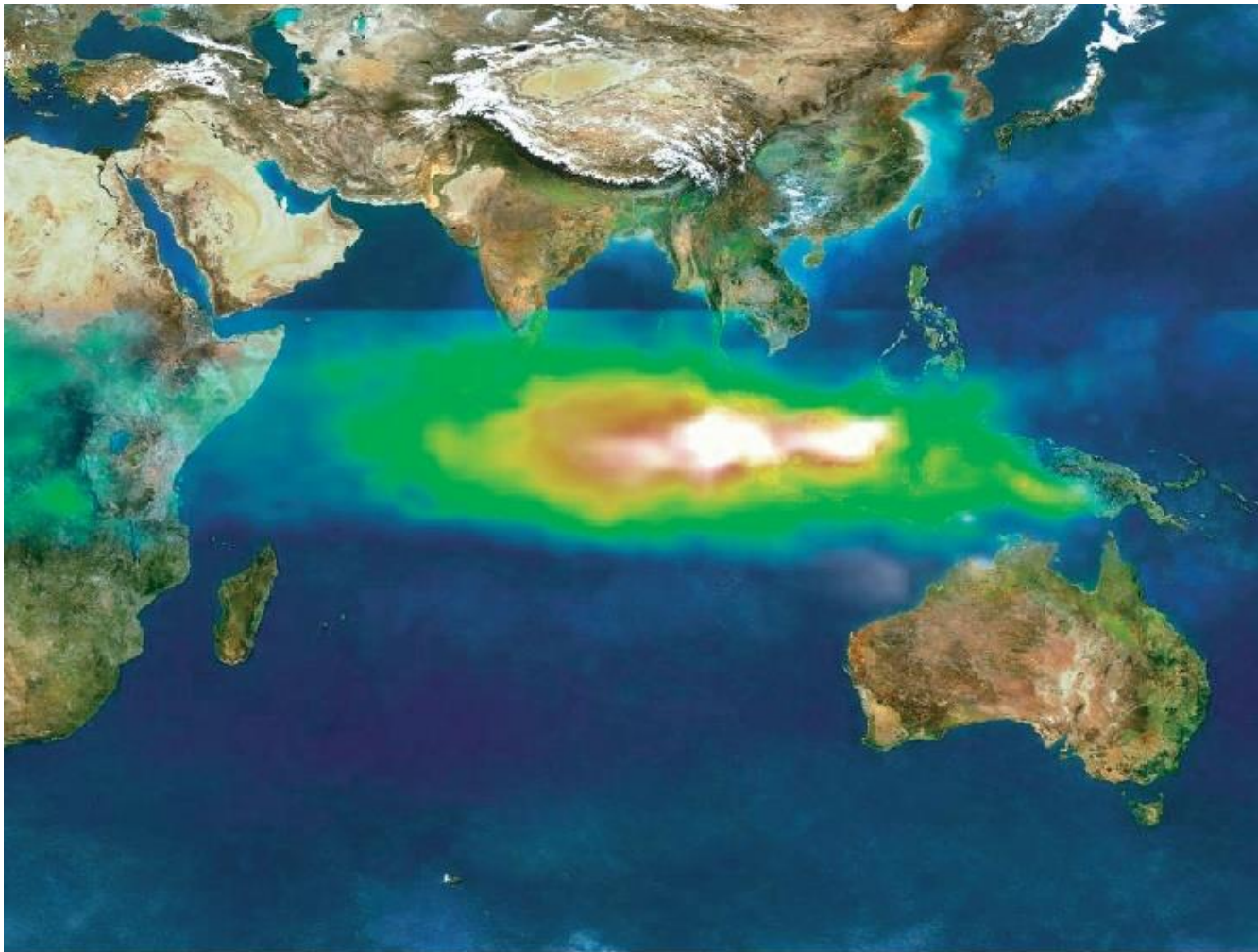
We must avoid fourth source syndrome on biomass as it is available on-demand

Can the earth deliver biomass-for-fuel we demand



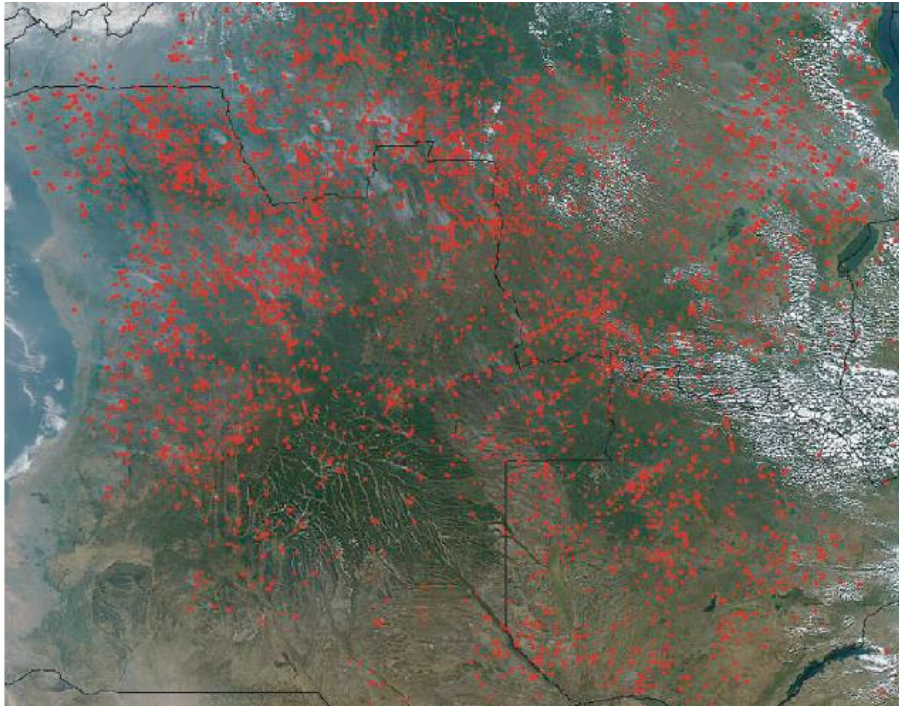
To scale – Earth radius to Earth radius + 100 km – human existence,
– Earth radius + 400 km – Outer space

Some burning issues

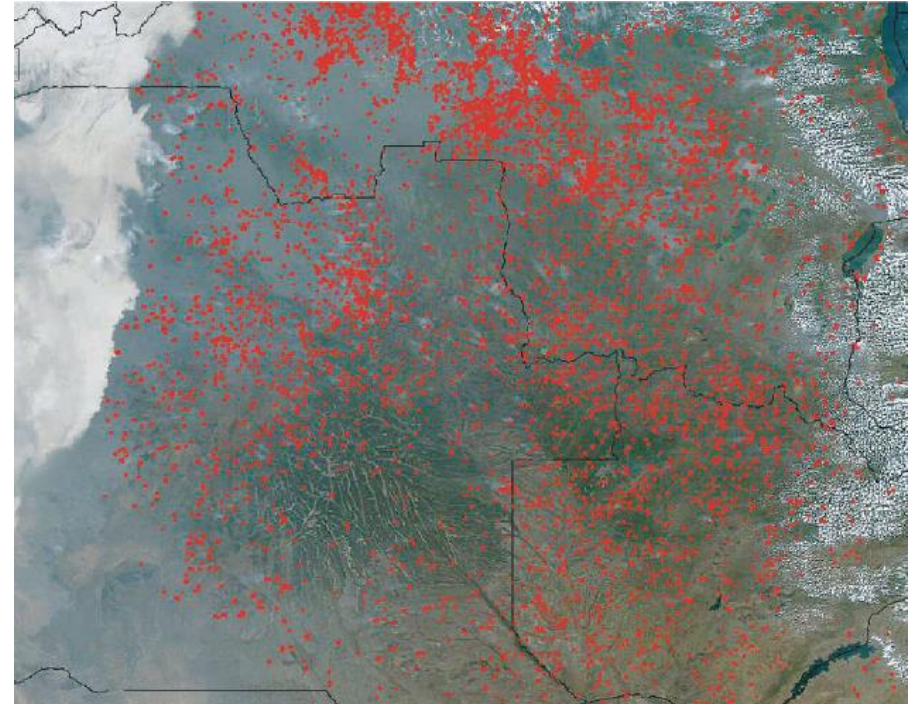


Fires in Indonesia/Malaysia aimed at clearing forests – 12 million hectares (1997), Partly for growing palm-oil plantations.

Satellite pictures

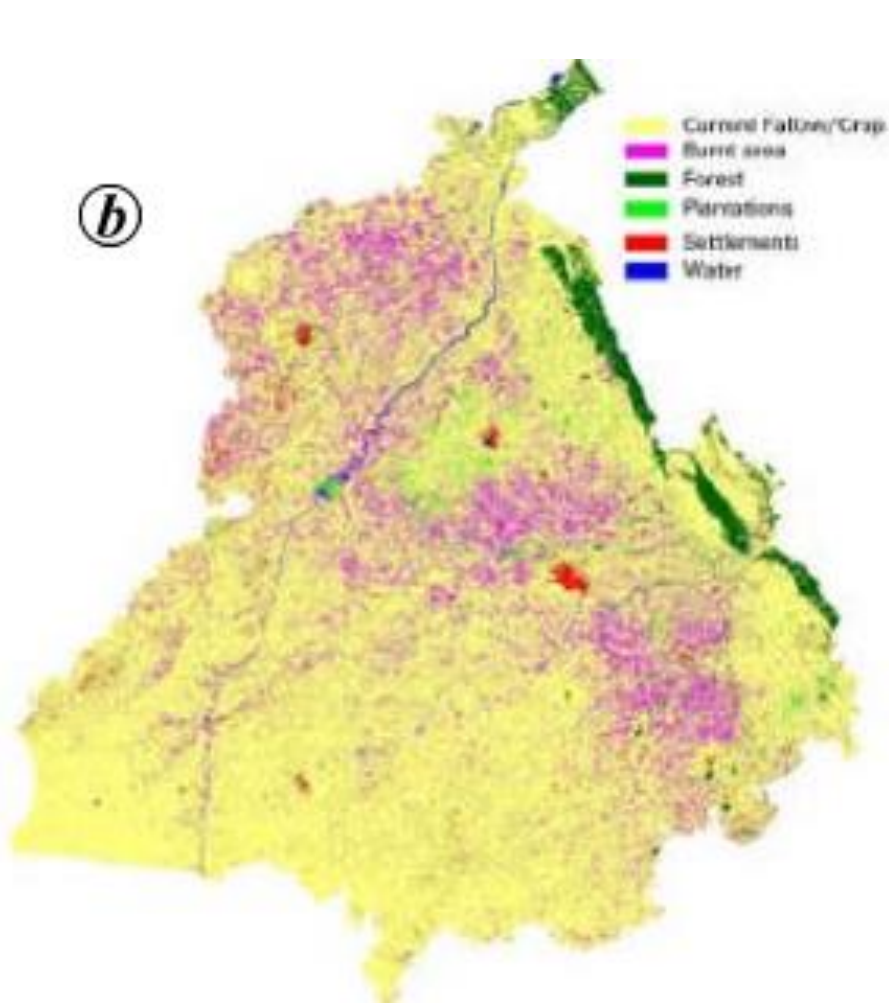


Clearing land by fires – literally thousands
500 km x 500 km size
Angola and Congo Dec 2005

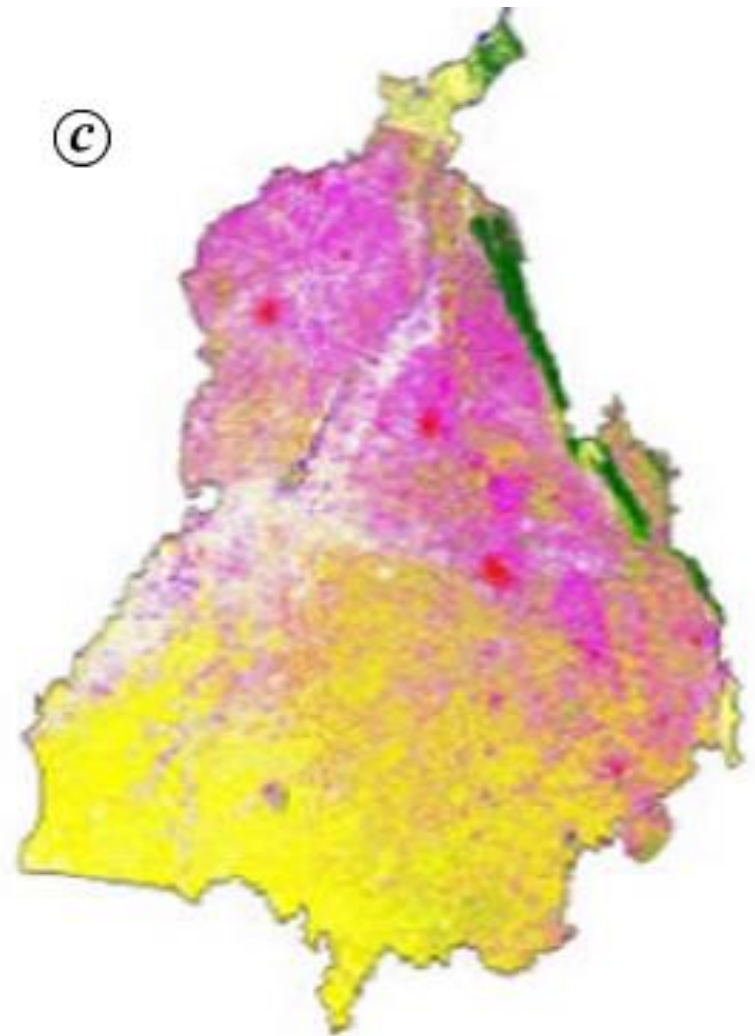


Clearing land by fires – literally thousands
600 km x 500 km size
Angola and Congo Aug 2006

So much energy is wasted and converted to CO₂ and spewed into the atmosphere.
The cooking energy requirements of the entire region for two years could have
been taken care!



Wheat field burning after harvest
 Punjab – 5500 km² May 2005



Rice field burning after harvest
 Punjab – 12,600 km² Oct 2005

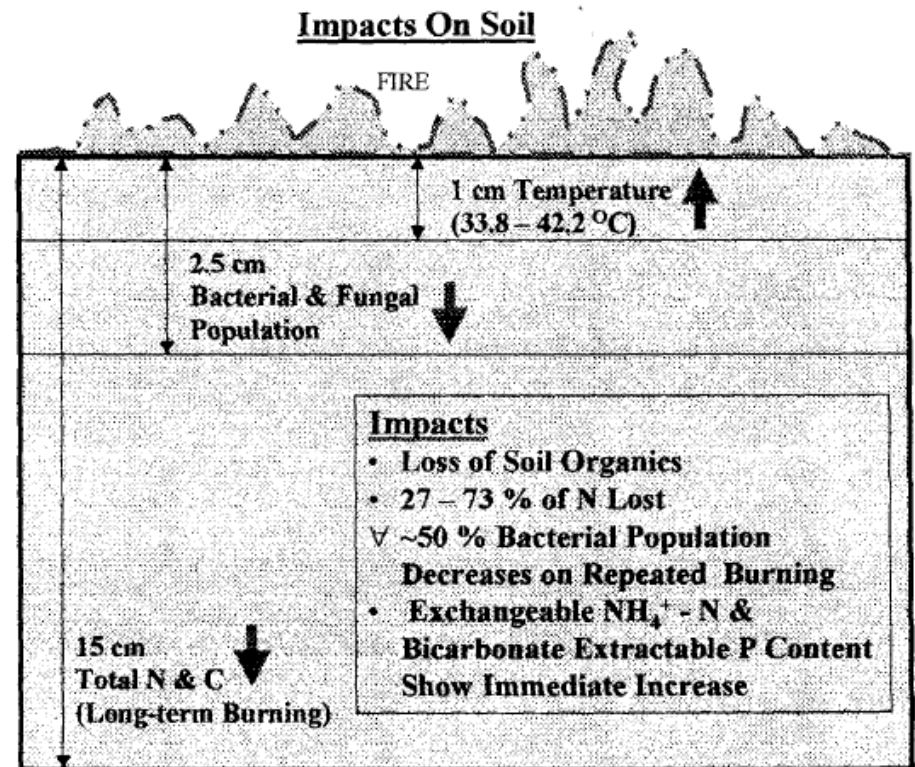
From an NRSA paper, Current Science, June 2006



Burning of Sugarcane fields – tops and leaves in most countries, India, Brazil, Cuba, Australia....

Leads to loss of nutrients...

Claims of climate change due to these effects – aerosols, soot,



Alternate uses...

Cooking use in 2009

India – 460 mmt (firewood, agro-residue, dung)

Africa – 750 mmt (firewood, charcoal, agro-residues)

A thought.....

Can't we return to the soil what is burnt in the field by processing and burning in the stove and return the ash to the soil to get back as much nutrient as possible?

Is the living on the planet sustainable?

Apparently it is not; Mitigation is possible if we

- regulate the population
- look for fulfilling needs – slow down
- care and conserve where we can
- increase end use efficiency and reduce emissions thereby.

New technologies may come by, but we need not wait for doing what we can