

The Consolidated Climate Change Theory

Basic explanations for a land climate recovery theory

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Non-peer-reviewed conceptual synthesis

This theory is presented as a unifying framework based on well-established literature (like foundational works of Pielke, Bonan, Makarieva, Millan, and others) and on our own studies since 2020. We invite peer-review, suggestions and collaborations for this initiative at: <https://www.climatechangetheory.org/the-initiative/>

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EXECUTIVE SUMMARY

- 1) We conquered the planet mostly through deforestation, and changed the land to our needs; therefore, we changed the land-linked regional climates (page 14).
- 2) The key to our proper Earth care and management are the correct and open assessment, fair and logical debate, agreement and cooperation.
- 3) In the 20th century the Land Use Theory (LUT) studied the land-atmosphere climatic interactions and recommended land use reduction (page 7).
- 4) In the 21th century the Carbon Emissions Theory* (CET) studies the greenhouse effect of carbon gases and recommends carbon emissions reduction.
- 5) Neither reducing land development, nor reducing carbon gasses emissions have proven realistic, while Earth's climate entered a critical phase (page 10).
- 6) The excessive infrared radiation produced by deforested lands greatly enhances the greenhouse effect that is amplified by fossil fuel carbon gases (page 24).
- 7) The proposed Consolidated Climate Change Theory (CCCT) improves conceptual models and merges LUT with CET through the modelling power of a new AI.
- 8) Since tree clearing has substantially changed regional climates, syntropic tree planting can improve regional climates while repairing the land (page 26).
- 9) Planting useful trees stops forest fires, decreases floods and droughts, builds up soils, and more than triples agricultural production per hectare (page 29).
- 10) Large syntropic land rehabilitation started from the coast move downwind as avalanche greening and cooling (AGC), improving regional climate (page 32).
- 11) Compact, city-style Unitary Rational Building (URB) saves land, and has outstandingly low specific capital, running, maintenance and transport costs (page 31).
- 12) Conservation of old forests and natural habitats in large Reserves becomes possible due to the large increase in land availability through higher productivity.

This new climate restoration strategy is made possible through its high financial benefits for the economic and public sectors.

Note*: We do not deny the carbon gases effects or their magnitude as stated by the IPCC; we just add to them the effect of deforestation since prehistory, resulting in a larger total global warming and climate change than that due to carbon gasses emissions alone; fortunately, we can reverse this.

Human-made climate change is real and is amplifying because it is due to the coupling between the atmosphere and Earth surface, which was changed [78]. Almost all the large, dense trees that created and stabilized the soils were cleared out, so now most of the land is desert, pavement or degraded land. The sharp decline in the state of the natural environment and climate requires a realistic plan with immediate and long lasting results.

The single way to really solve the controversial Earth climate problem is to openly and correctly discuss the issues and find rational solutions.

Over time, the system of complex interests and feedbacks in society between economic, public, and scientific groups has led to this climate crisis (Annex 3).

The crisis is due to insufficient rationalism used in analyzing the economic, social and environmental interests and in generating suitable solutions.

Neither the Land Use Theories (LUT) or the Carbon Emissions Theory (CET) show how to really decrease land development or carbon emissions.

The benefit from the CET was the development of the renewables technologies, which are still insufficient and cannot replace most fossil fuels [57].

Continued deforestation alters the surface – climate balance and the powerful water cycle, resulting in desertification and climate change [66][58].

Over the 30 years of CET and focus on carbon, damaging deforestation (tree clearing and fires) has accelerated, creating a real climate crisis.

Low latitude deforestation has warmed all the Earth by relocating clouds from lower to higher latitudes, flooding and overheating the latter *[25].

The above were amplified by the enhanced greenhouse effect produced by the carbon gasses emissions, especially since the industrial revolution.

While CET is yet to properly model water and vegetation, and some studies show the latter unwanted, LUT holds them vital and is based on them.

Therefore, we could use CET and LUT to compensate for one another in a unified theory that joins their strengths and avoids their pitfalls.

Despite the late climatology focus on CET, land managers are increasingly applying millenary wisdom for restoring their local water cycle with vegetation.

Global climate restoration is really possible only if it would produce significant economic and financial benefits for private and public sectors (Annex 3).

Therefore, an unified theory must properly explain climate change and suggest overall-beneficial solutions for regional eco-climate improvement.

1. OUR PROBLEMS WITH THE NATURAL ENVIRONMENT AND THE CLIMATE

Before humans, Nature was vibrant and thriving, covering the entire Earth in a brilliant living layer, while the climate was normal and sustained life. Creatures and the early humans were adapted to those normal conditions, which we started to change for our exclusive, apparent advantage. We detached ourselves from Nature, invented human society and an artificial way of life and started to change our surrounding environment. However, our artificial way of life also relies on natural conditions, so when we changed Nature too much, our way of life started to degrade. Pollution, loss of land productivity and a destabilized, damaging climate were observed in the past 40 years to produce significant losses. Yet, for a while, the benefits from continuing to do business as usual were larger than the losses produced by the destabilized environment.

However, in the past 5 years the mega-forest fires, tornadoes, extreme floods and droughts have shattered our economy and public opinion.

Climate change through deforestation is increasing, despite it was known since Gilgamesh [89] that clearing trees degrades the land and the climate. Thus, early climatology was dominated by studies of land use and land cover change (LULCC), that form the LUT, as shown in Annex 2.

LUT reflects the complexity of Nature's interaction with climate, but could not be properly modeled with the previous computer systems; hence LUT fell behind.

The increase in computer power after 1980 allowed climatology to create the first global models, thus the reference point was moved to the top of atmosphere. The result was the CET, focusing on CO₂ and supported by a planet Venus model, that is substantially different from Earth, thus comparisons may be deceptive. Relying only on the radiative processes at the top of the atmosphere (TOA), CET distorts (parametrizes) the ground-level processes that it cannot model.

CET calculates mainly the greenhouse effect at TOA, but the Earth has clear symptoms of a destabilised water cycle far below the TOA (see page 27).

Contrasting with the imperfect results, there is a push towards global management through carbon gasses emissions, while overlooking land use management. Apparently, the incorrect solution of geoengineering solar radiation would delay this crisis, but it is even more damaging and unsustainable [60].

Should we risk our single planet with more un-natural changes, or repair the past ones with sustainable, beneficial and Nature-friendly methods?

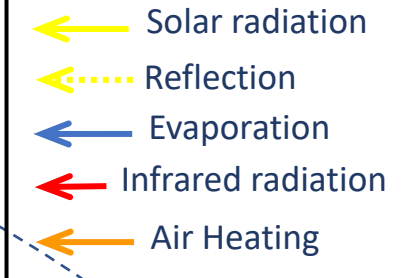
Further, it will be shown how the imperfections of all climate theories brought us to this impasse with lack of solutions, thus theoretical improvement is needed.

- LUT comprises very diverse theories (see Annex 2) that describe the land - climate interaction, now mostly overlooked, as having only regional effects.
- **However, the global climate is the result of all regional climates, thus improvement of the land climate is possible.**
- Many still consider that land climate effects would be negligible, since land occupies only one third of Earth, and is far below the reference system of CET.
- Since before humans most land was covered with dense forests, it indeed evaporated about the same quantity of water like the surrounding oceans.
- However, after humans deforested almost all land, evaporation was substantially reduced, increasing solar air heating and reducing the low thick clouds.
- Some climatologists assume that LUT processes would cancel each other at the top of the atmosphere, where they calculate the climate effects.
- **However, a change in vegetation cover changes albedo, evaporation (thus clouds) and infrared radiation, thus the top of Earth energy balance.**
- Another reason for many processes of LUT being misrepresented in CET is their too higher complexity for the present Global Circulation Models (GCM).
- The work of G. Bonan has shown that, despite the interdisciplinarity and interconnectivity of LUT processes, the GCMs could be successful in the future[66].
- **As such, the advent of artificial intelligence (AI) opens the possibility to improve the models and decrease the scale of the simulated processes [94].**
- A significant barrier for LUT was its recommendation for a decrease in land development, opposing the dominant societal interests.
- **In the 21 century, LUT was replaced with CET, which does not stop land development, and introduces a difficult demand of carbon emissions reductions.**
- Deforestation and land development has accelerated everywhere, as at COP26 deforestation halt was delayed to 2030, amplifying the crisis.
- LUT recommended planting of trees to stop soil erosion and restore land evaporative cooling, but it has theoretic and economic opposition.
- Moreover, some CET concepts and some scientific papers justify deforestation [46] and oppose reforestation [51], decreasing the chances of recovery.
- IPCC reports quote both the benefits and disadvantages of forests, but recommend caution for reforestation and afforestation in line with [51], [52], [53].
- Present economic and land development interests also oppose reforestation, making restoration of biotopes and regional climate more difficult.

Since climate restoration through reforestation has numerous opponents, realistic ways must be found for land restoration with other kinds of trees.

Consider the cause of the global transition from low thick clouds to high thin clouds *[24].

Improve the conceptual models referring to water by properly including all its radiative cooling to avoid unreal results showing water as a climate warmer [2]. These issues reflect on the problem of excluding water from the climate drivers.[3]



Infer the ratio between the radiative flux of CO₂ in the lower troposphere and the other radiation sources

Fossil fuels burning
 Agriculture
 Extractive carbon gases
 Vegetation burning
 Industry (cement)

Calculate the total radiative forcing of forests versus deforested land considering both the albedo and the cloud feedback, knowing that forests are mostly covered by clouds [84].

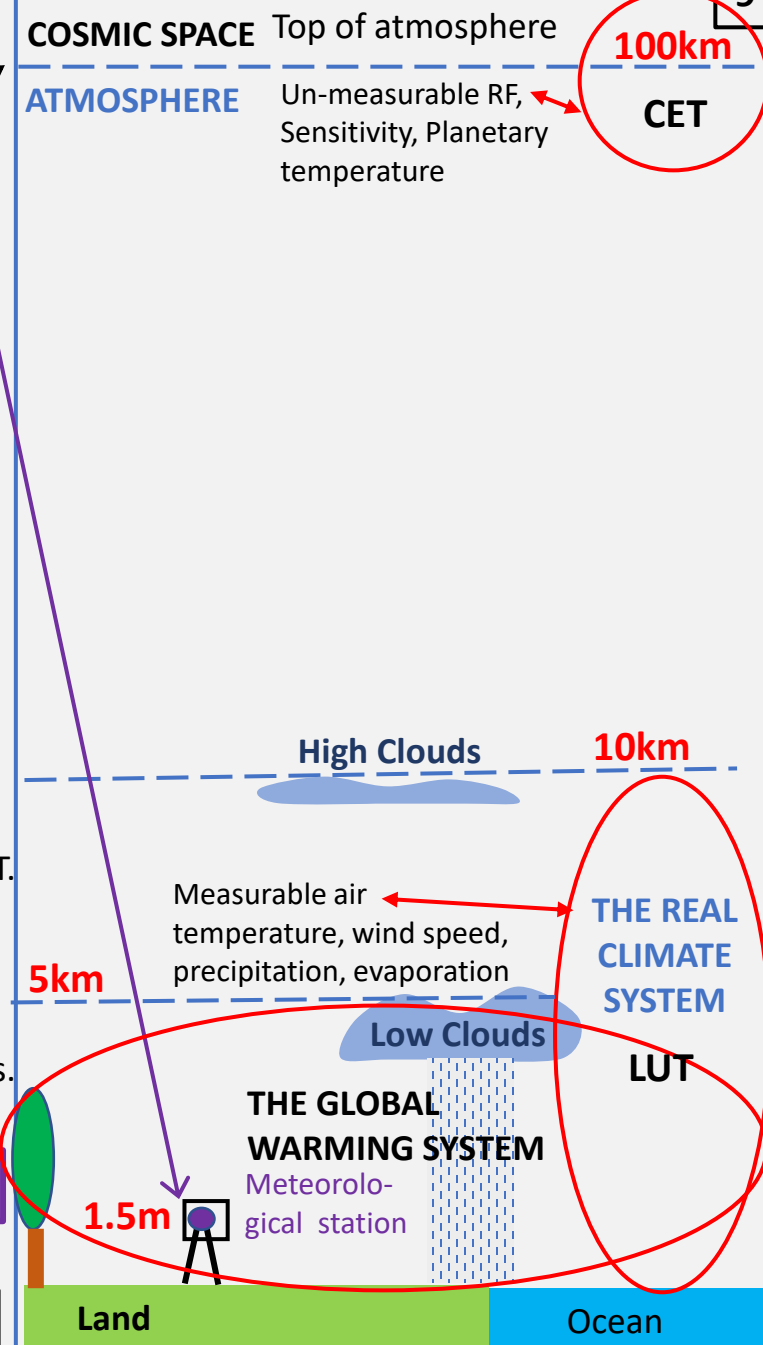
- Consider all drivers of climate change even if some vary regionally, since they have effects at TOA [61].
- Include in its validation methods the millenary ground observations and human wisdom.
- Accept and include interdisciplinary dialogue and contributions towards land and regional climate restoration.
- If it cannot model realistically the lower climatic processes, CET remains disconnected from the real climate

To properly represent Earth climate, CET needs improvements

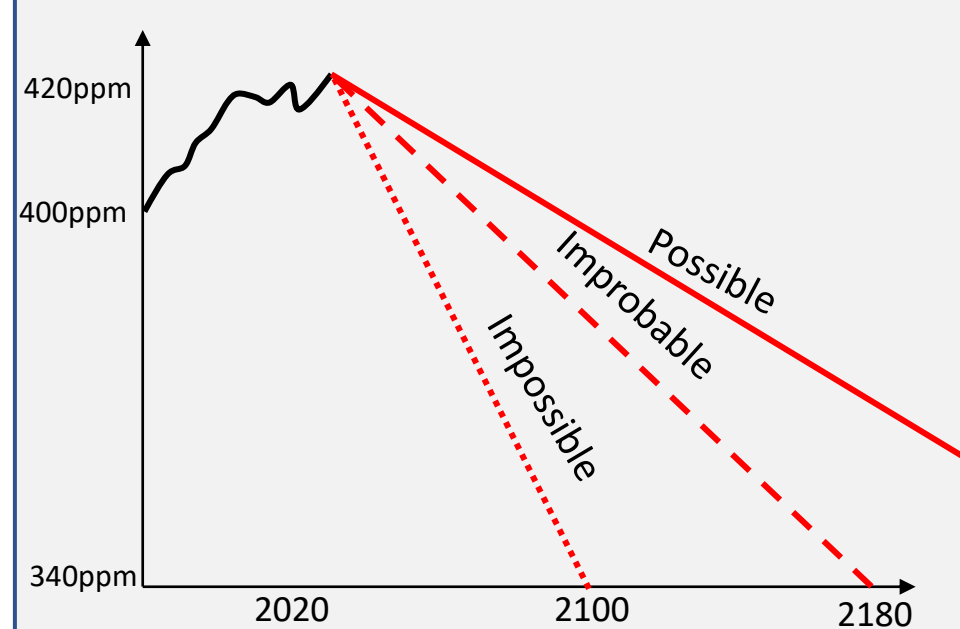
3.1 COMPARISON OF GLOBAL WARMING (GW) AND CARBON EMISSIONS THEORY (CET)

- **Reference system:** CET calculates estimates for the top of the atmosphere (100km) system of reference, while the real climate is under the clouds (10km), and the system of reference of global warming (GW) refers to the air temperature at meteorological stations, at 1.5m above the ground (under 5km altitude).
- **Object of study:** GW uses real temperatures, while CET uses the greenhouse effect (GHE) as a proxy.
- **Means of study:** GW measures above-ground temperature, while CET models un-measurable parameters.
- **Temporal aspect:** GW measures past changes, while CET estimates future changes.
- **Method:** GW uses statistical analysis of real data, while CET uses computer simulations
- **Relevance to reality:** GW uses real temperatures, while CET uses artificial parameters like the planetary temperature, radiative forcing (RF), sensitivity, that are difficult to correlate to the real processes.
- **Exclusivity:** CET practically excludes through parametrization the essential variations of real climatic parameters that it cannot properly model, that results in its models not representing reality.
- **Reciprocity:** GW can be calculated from all the local values, but this or the reverse are not possible with CET.
- **The results of CET** cannot predict real climate, what weather where and when will occur.
- **Management value:** the extreme local values of GW are more valuable than CET's global average.
- **Connectivity:** Thus, GW is much more related to LUT than to CET, and it easily integrates into LUT processes.

CET needs merging with LUT to represent GW, the real Earth climate, or to be used in management

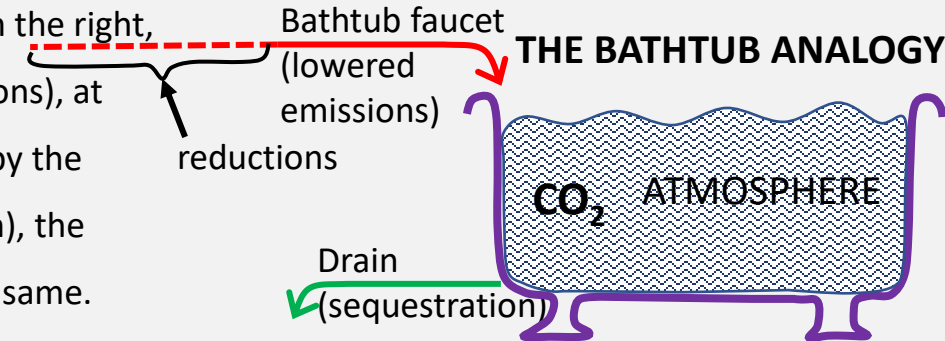


1. The radiative forcing (RF) of deforestation water should also be accepted, similar to the RF of irrigation water (Fig. SPM2 of [88]).
2. The greenhouse effect of carbon gases or any other gas does not depend on their residency time in the atmosphere [83], but only on their amount in air.
3. Improvement of climatic theories is simpler and less expensive than the development of the dangerous geoengineering of solar radiation.
4. Essential phenomena like evaporation or condensation cannot occur at the average values resulted from the spherical geometry division used by CET.
5. A reduction of emissions as in the graph on the left reflects that the replacement of renewable energy generators requires continuous, large fossil fuel use.



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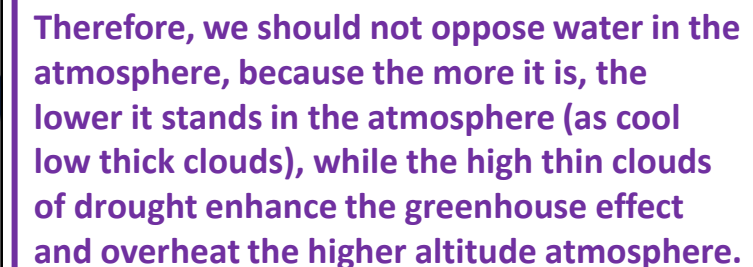
In a realistic bathtub analogy, as seen on the right, even if we could turn the faucet (emissions), at half flow to equal the water evacuated by the bathtub drain (the natural sequestration), the water level in the tub would remain the same.



Since the largest part of fossil fuels is used for heating, to reduce global fossil fuel use by half, the regions above 45° latitude would face severe heating deficits, as local renewables/storage are greatly insufficient, and the infrastructure to transport vast energy from lower latitudes does not exist. Even if this problem would be solved the next century, as seen above, it would not reduce global warming.

Therefore, only a significant increase in a realistic way of carbon sequestration (the bathtub drainage) can decrease the CO₂ in the atmosphere, like it will be shown further in this presentation.

We must reduce CO₂ by using all possible renewable energy, but to decrease the carbon greenhouse effect we need environmentally friendly carbon sequestration.

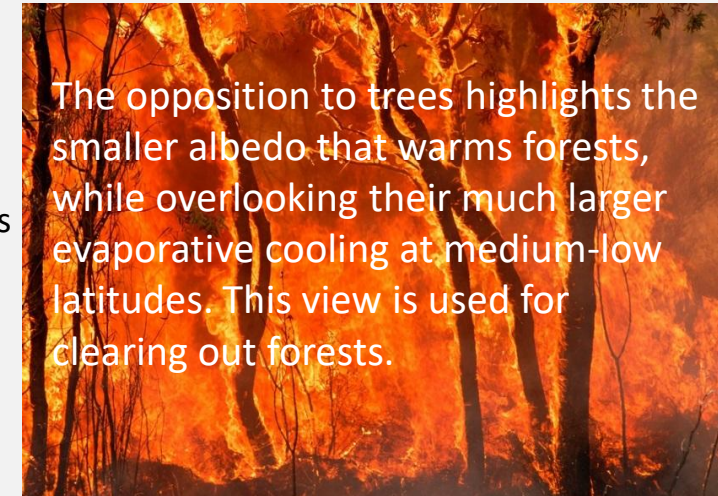


Many recent studies oppose tree planting arguing that it would exacerbate global warming and turn forests into carbon sources if trees were to decay, making the situation worse than it is [51]; however, future trees cannot emit more carbon than they have absorbed from the present. Unfortunately, many of these exaggérations wrongly influence the IPCC. We should ask why would we push forests to decay or put fire to them? They thrived millions of years before us.

Other unbalanced arguments against planting trees:

- That carbon dioxide intake by trees would decrease as CO_2 levels increase to a point where photosynthesis becomes saturated [52]. In reality, photosynthesis increases to double the present level of CO_2 .
- That it would decrease biodiversity, when in fact forests are more biodiverse than grasslands.
- That afforestation should not be used to convert grasslands [53] and pastures, ignoring that most grasslands are results of older deforestation, so we would be restoring tree areas, not making new ones.

The opposition to planting trees and sequestration of carbon from the atmosphere ends in damaging the planet's water cycle and natural cooling. The result is opposite, of overheating the Earth, and really damaging ecosystems through desertification.



The opposition to trees highlights the smaller albedo that warms forests, while overlooking their much larger evaporative cooling at medium-low latitudes. This view is used for clearing out forests.

Some studies and IPCC discussions highlight regional trade-offs and risks of poorly planned afforestation; this has sometimes been used to justify opposition to reforestation.



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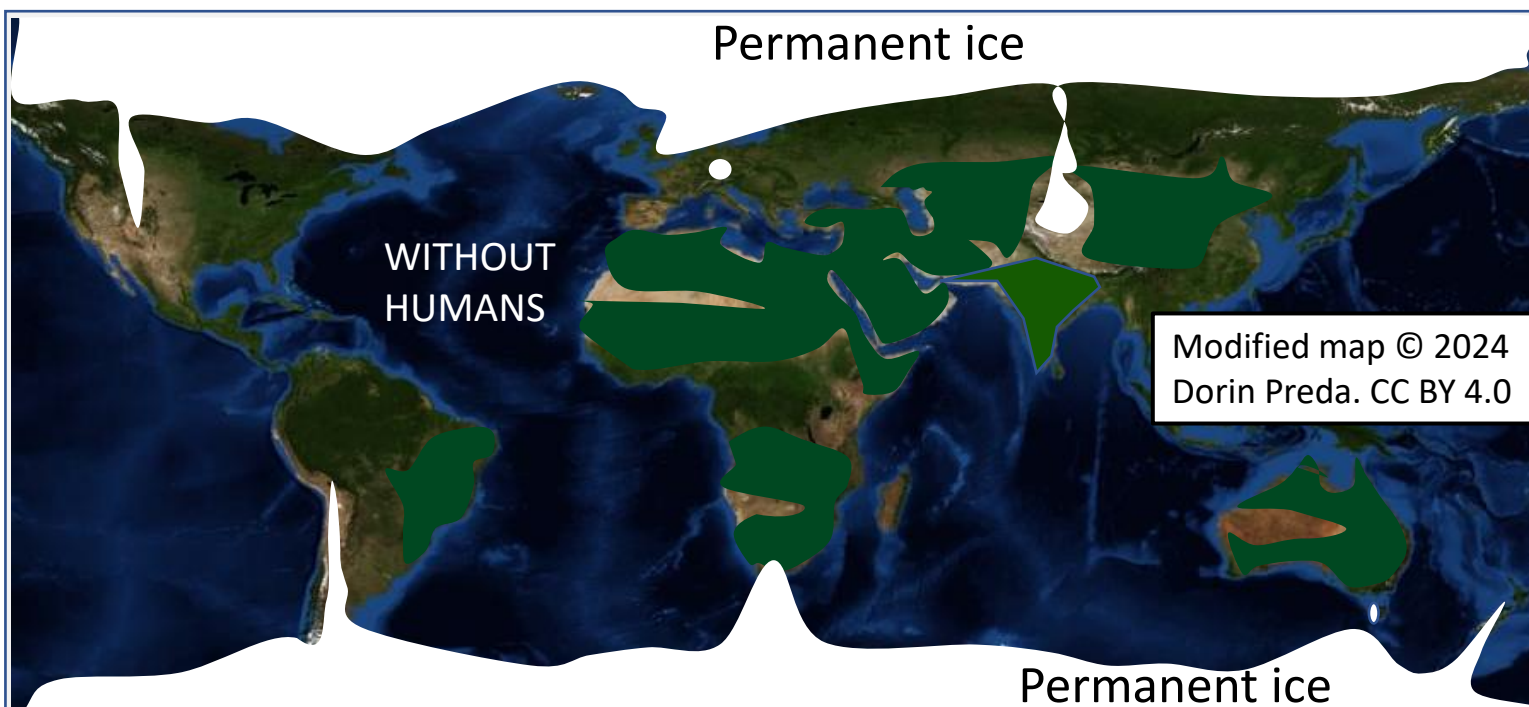
In addition to restricting natural water cooling through reforestation, deforestation halting has been extended at COP26 to 2030, thus rushed clearings are now underway all over the world, deepening the eco-climate crisis.

Unfortunately, damaging solar geoengineering methods for climate intervention are also envisaged. Repeatedly injecting harmful substances into the atmosphere will not fix the climate, but worsen it more. To restore the climate, we must reduce the changes we have made to the planet, not exacerbate them.

Therefore, the opposition to tree planting is unjustified, and leads to irreversible Earth degradation.

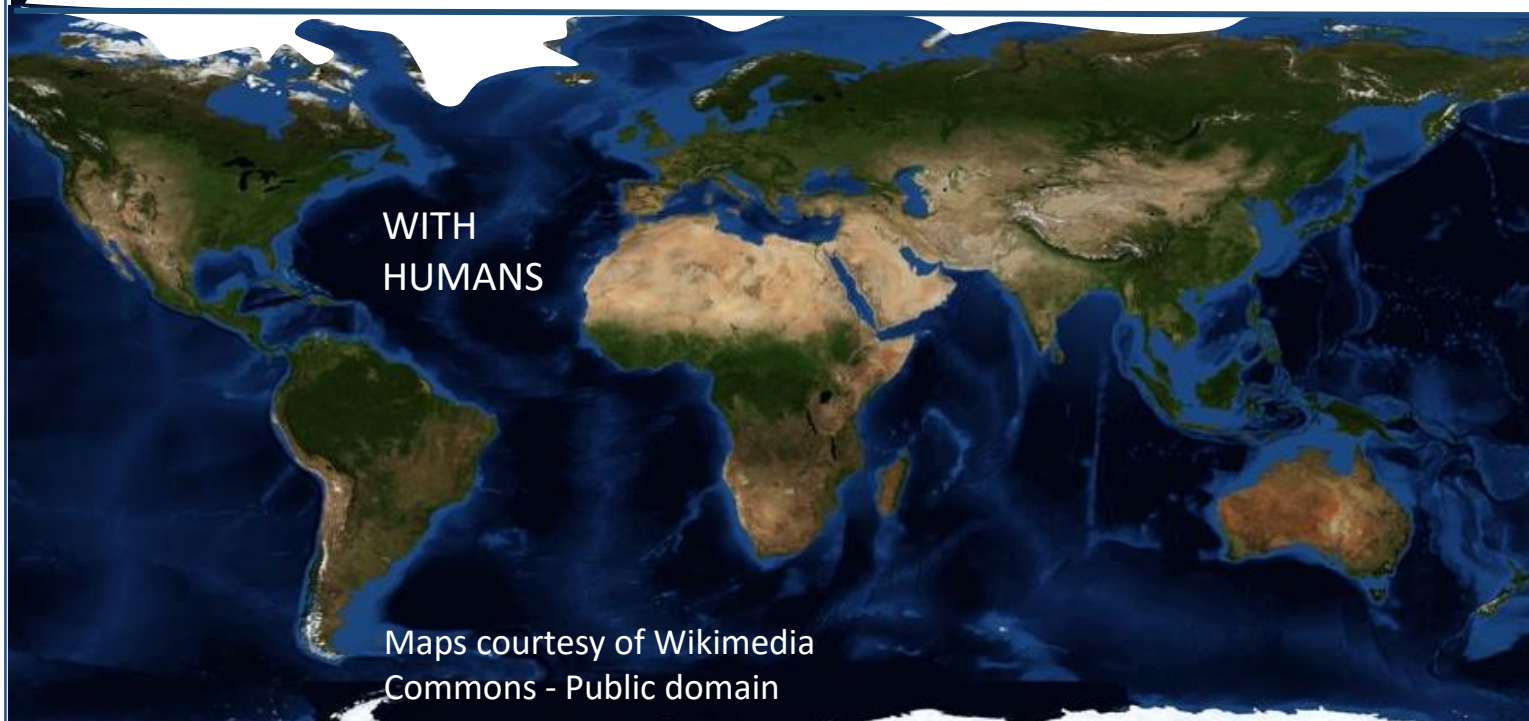


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If humans never existed, probably now it would be:

- Almost all land covered in forests; few savannas or drylands
- Full original biodiversity
- Much more water on land, especially at low latitudes
- Far less of today's CO₂, so quite little for plants [26]
- Less water in the atmosphere, especially in the upper one
- Thick soils would cover the land with deep, moist litter
- Frequent small rains, no floods or droughts because of abundant groundwater and above land freshwater.
- The beginning of a glaciation; much more land ice [26]



Earth now:

- About 30% of initial forest area and 10% of its initial mass
- Half of Earth is barren land or desert, the rest is stressed.
- A few degrees Celsius local warming due to dryness.
- About 420 ppm CO₂, increased by 50% in the past 250yrs
- Far less biodiversity and mass of wild animals
- Exceptional heat, floods, droughts, tornadoes.
- Land climate changes alter the moderating sea climate.
- Most studies consider present tropical aridity as natural, but SE Asia and Americas are still green. Baghdad and Memphis USA are at the same latitude landlocked with a river passing through, but have very different climates *[25].

Humans have produced the largest and sharpest land and climate changes.

About 1 million years ago, humans invented artificial fire and used it to make clearances in forests for hunting and defence.

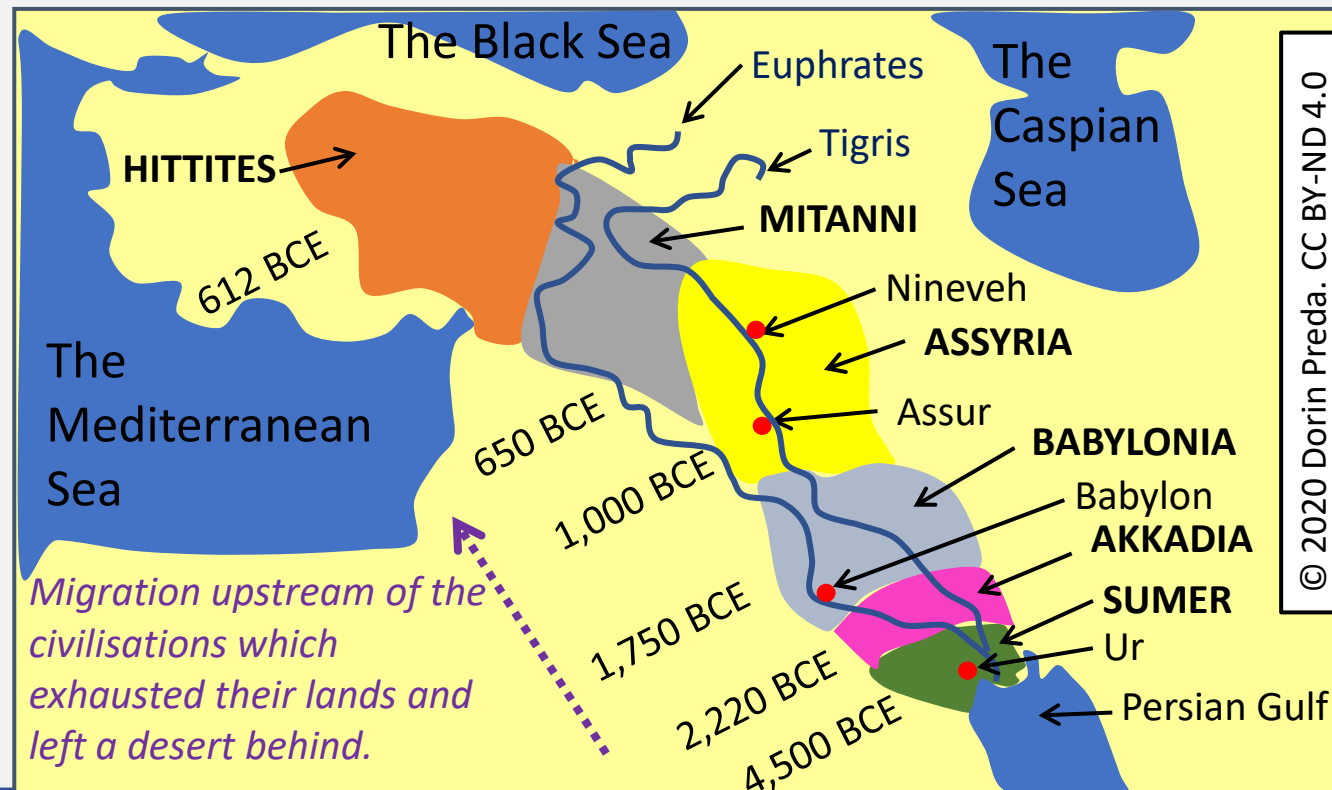
Later, they burned the forests to make room for pastures, settlements, agriculture [64].

However, when vegetation is cleared, less clouds are formed and precipitation decreases, leading to droughts and further vegetation loss [28][29][30], in a successive destructive process, like an avalanche.

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Initially, people settled in the most fertile regions around river mouths, that were the best for the newly-invented agriculture. The first civilisations appeared on the Tigris and Euphrates rivers, in Mesopotamia, near the Persian Gulf. →

The formerly green Mesopotamia is now the Middle East desert, while elsewhere on the same latitude in the Americas or Asia the land is still green *[25].

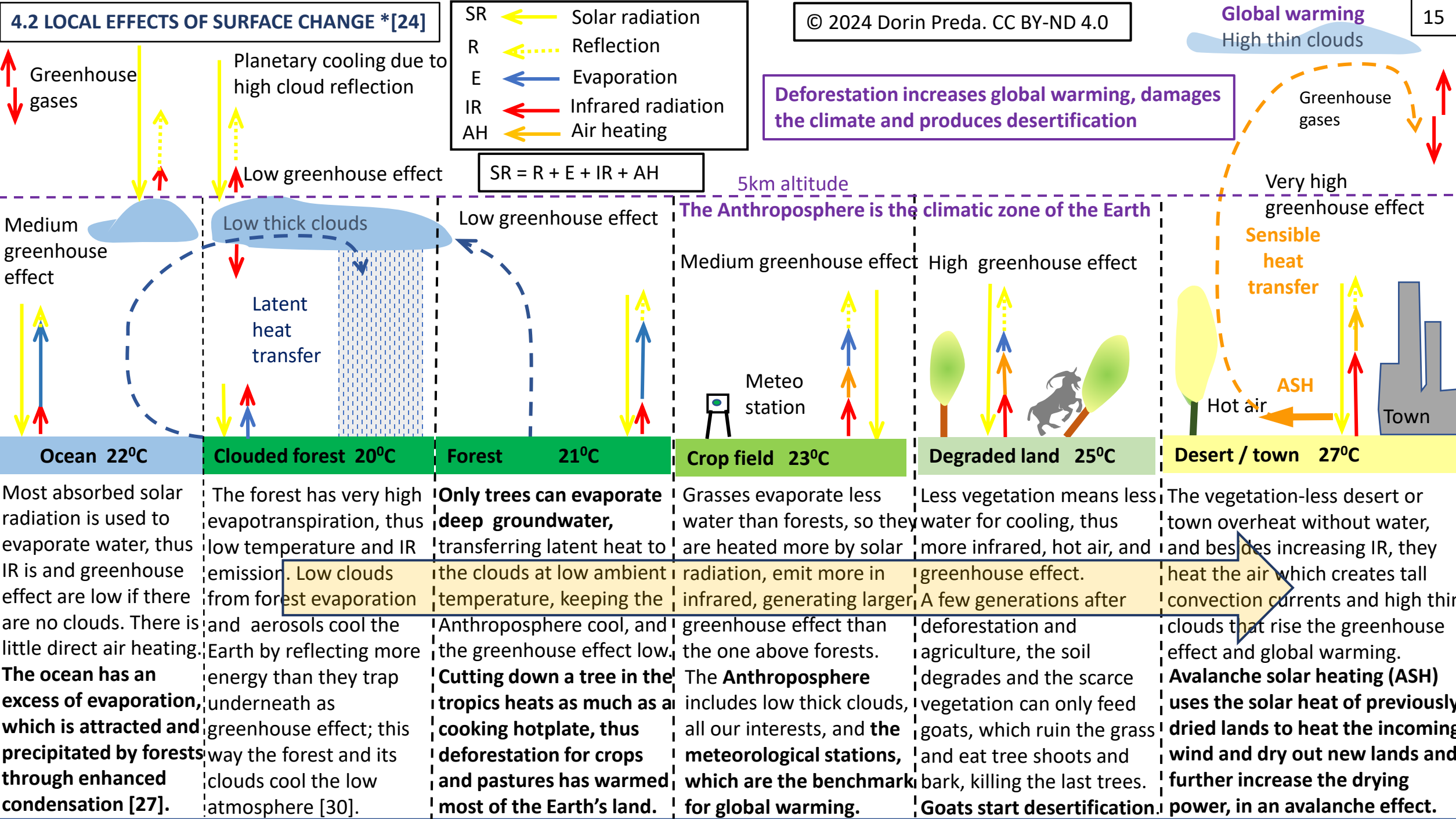


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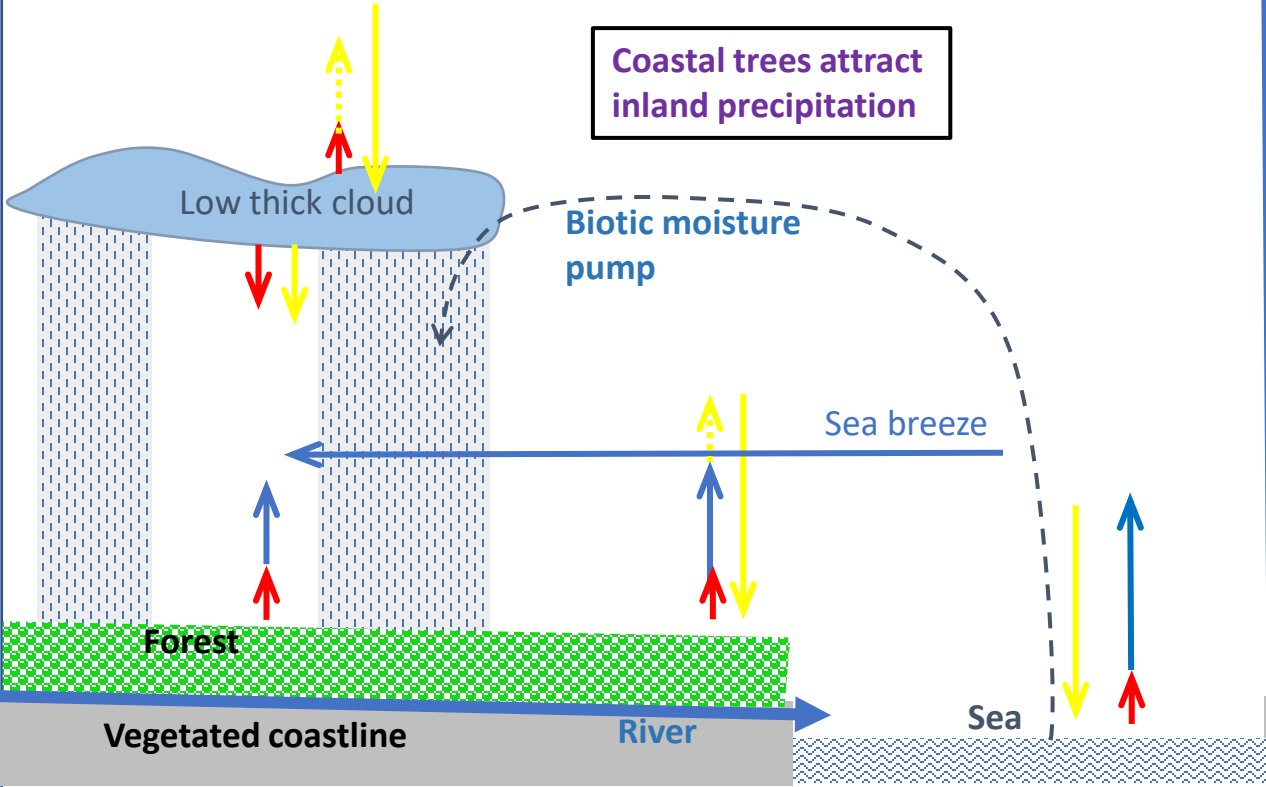
Deforested land quickly decays in the sun after agriculture tillage. Dried soil exhausted by irrigation is then eroded away and only the sand remains [65].

The pastoralists on the Eurasian steppe cut their forests and also lost their soils, resulting a chain of deserts from Europe to China.

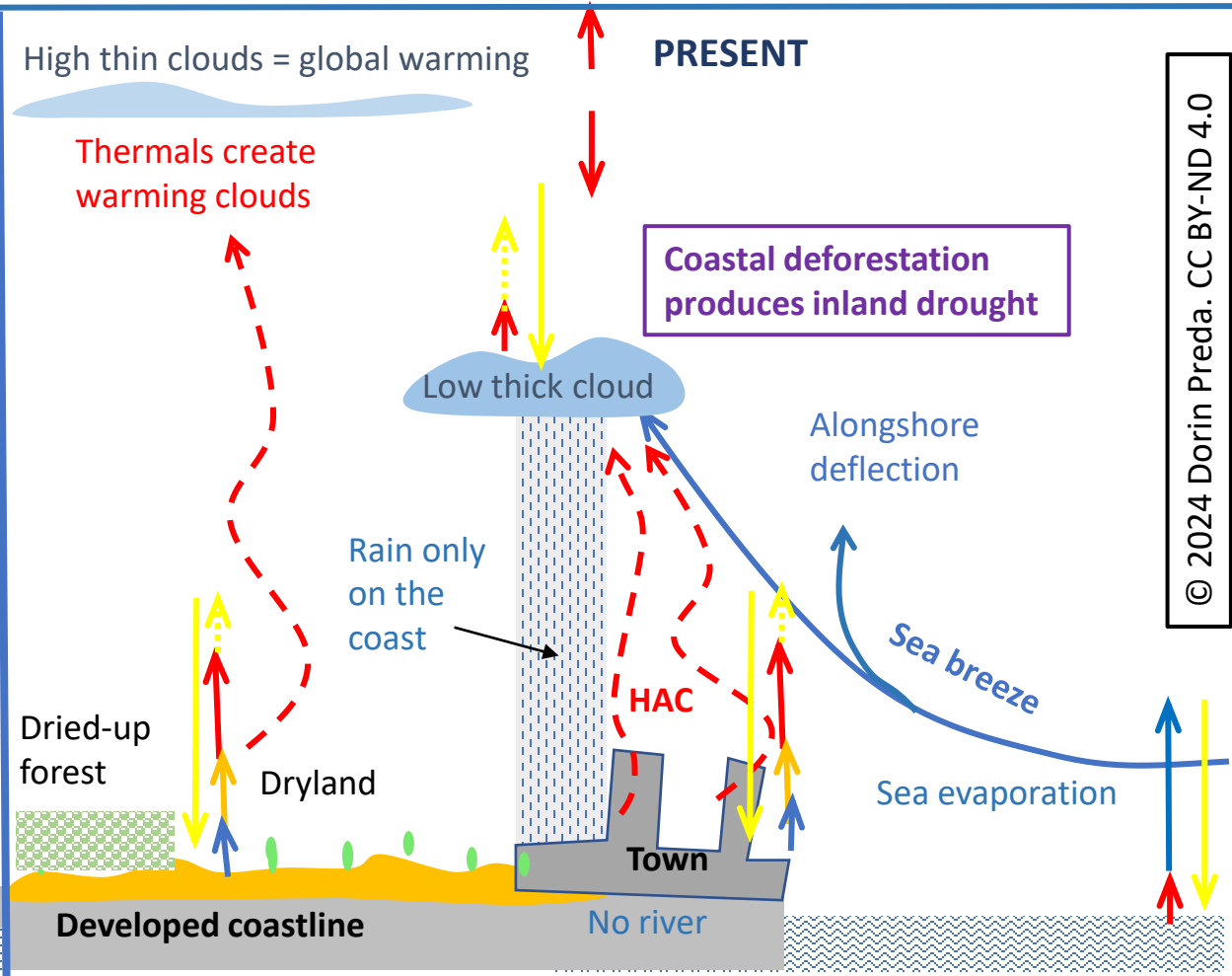
All ancient civilisations grew on fresh good lands which they exhausted, then their power diminished as the fertility of their lands was lost, and people had to move on new lands.



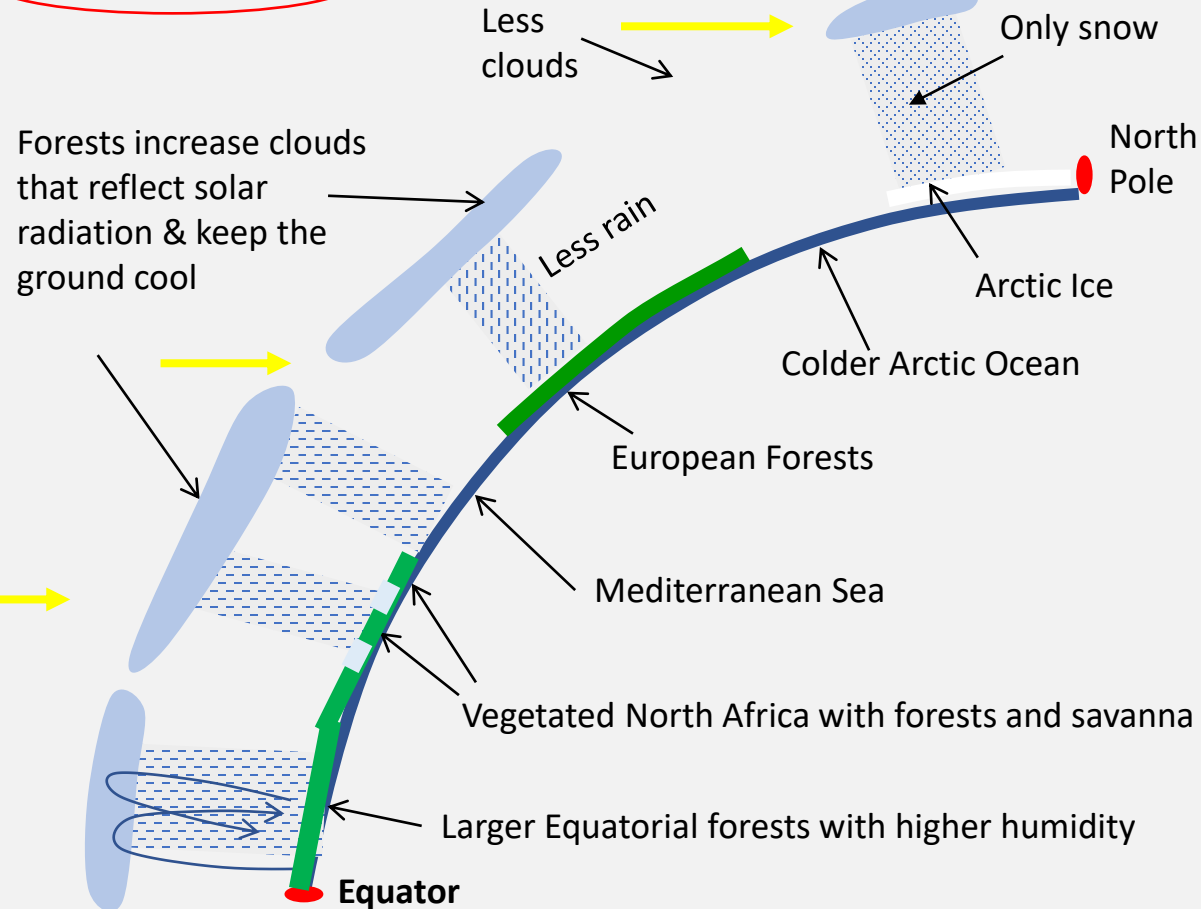
- SR ← Solar radiation
- R ← Reflection
- E ← Evaporation
- IR ← Infrared radiation
- AH ← Air heating



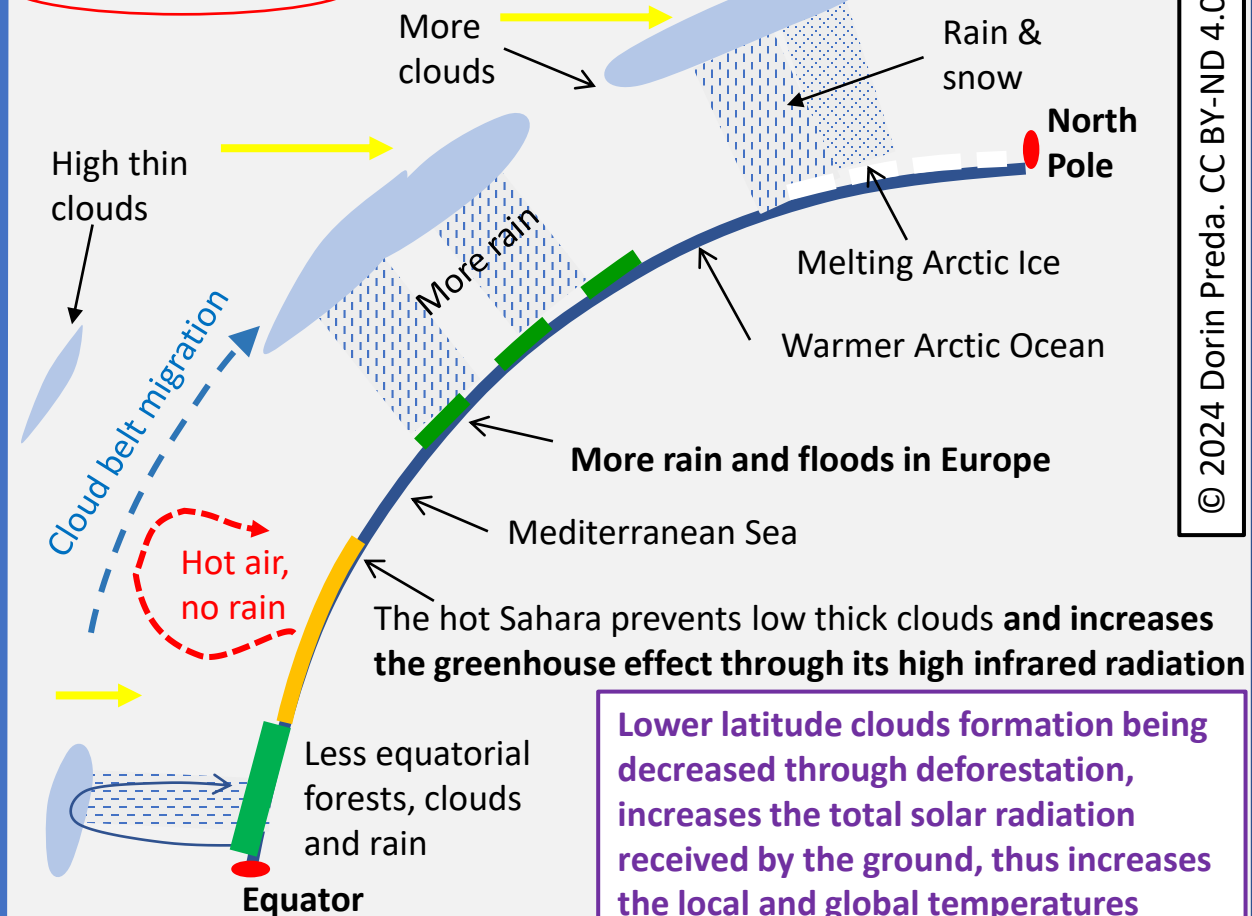
All coastlines were initially covered with forests that attracted marine humidity through biotic pumps [27], and ocean - land pressure differential [80][24]. They favoured regular rain that fed the forests and created rivers from their excess precipitation/evaporation. **There would be no water on land if precipitation would not be induced more above the land than above the sea. Only dense trees and mountains can regionally induce precipitation on land.**



When coasts are deforested, they overheat the air that raises in strong thermals, creating a **hot air curtain (HAC) *[24] which stops marine humidity from reaching the inlands, which this way dry out [28].** The sea breeze is either deviated alongshore, or pushed upwards to reach its condensation and precipitation height to create excessive coastal rain. Water that naturally would evenly feed the inlands is now **flooding the coasts** or is diverted away. *[25].

BEFORE HUMANS

- The African equatorial forests were larger and wetter.
- Sahara had lakes, forests, elephants, crocodiles, thus wet climate.
- More clouds in the low latitudes meant less solar radiation on Earth.
- Most tropical ocean vapours condensed in the low latitude lands.
- Less clouds, precipitation and heat reached the higher latitude lands.
- Colder air, clearer sky allowed only snow than kept the Arctic frozen.

PRESENT

Lower latitude clouds formation being decreased through deforestation, increases the total solar radiation received by the ground, thus increases the local and global temperatures

- North Africa was deforested in prehistory for pastures, and by Cartagena and Rome for crops, increasing insolation and stopping cloud condensation, reducing rainfall and resulting in drylands and the advancing Sahara desert.
- This process repeated in Middle East and all Eurasia, changing global climate.
- Since the low latitudes are now sunnier, they overheat the entire Earth.
- **The increased tropical ocean vapours can now only condense at higher latitudes, overheating and flooding them and increasing global warming.**

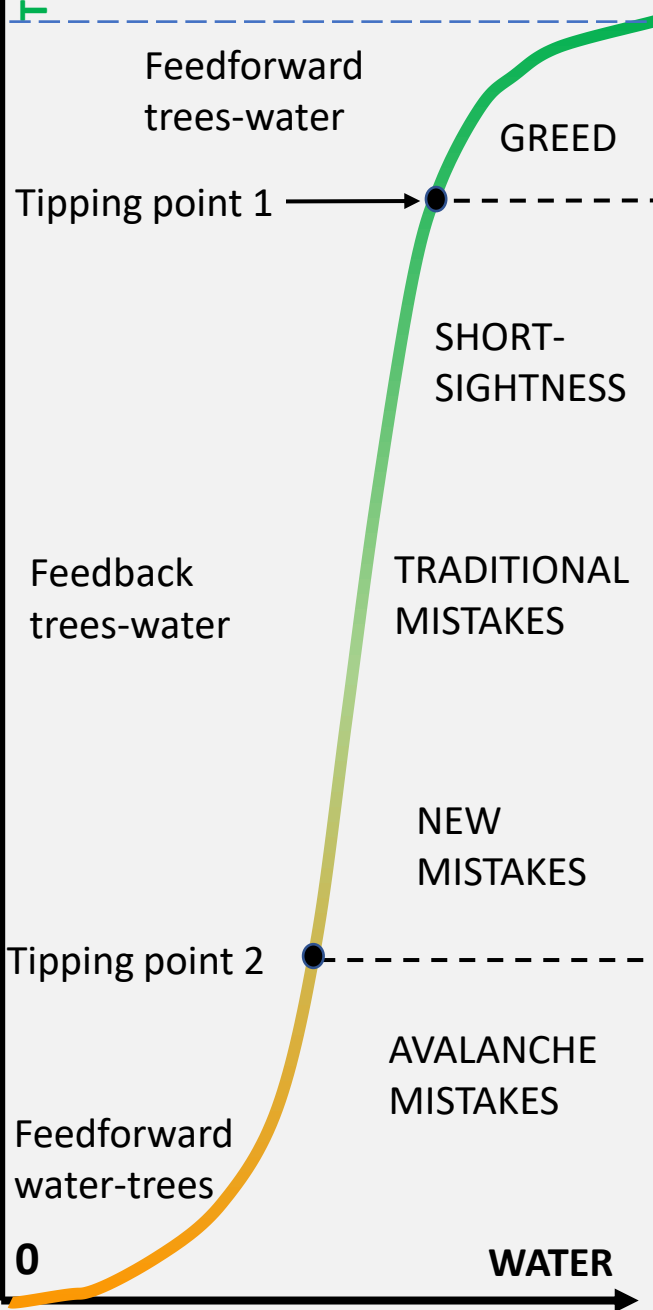


Deforestation decreases water evaporation, thus solar energy overheats the lower troposphere. **As above, local deforestation daylight warming may be of up to 460W/m^2 , able to substantially heat the air and quickly dry the adjacent vegetation and bring it close to criticality [7].**

Sunshine overheats the bare land and the already dried vegetation to produce Avalanche Solar Heating (ASH) , which dries up more vegetation in its path (avalanche effect). ASH dries up the trees around forest clearances and thinning, especially if the groundwater is extracted with pumps from tree roots area. **Deforestation and forest thinning cause extreme dryness. This way, trees transform into fuel.**

When ignited, the critically dried trees burn violently, creating an Avalanche Forest Fire (AFF).

4.6 THE DEFORESTATION – DESERTIFICATION MECHANISM (IN NORTH AFRICA)

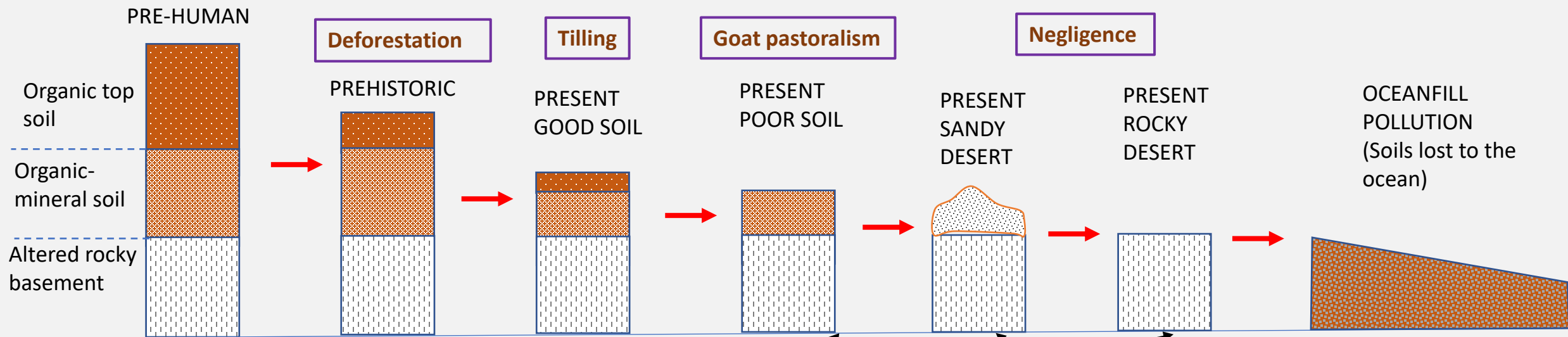


Before humans, N Africa had forests, lakes and savannas with lions, elephants, antelopes, crocodiles. Humans have put fire to vegetation for hunting and to promote grasses for antelopes versus useless trees. As result, the central Saharan belt dried out, most forests disappeared and the dryness cycles begun. Later, the Egyptians, Carthaginians and the Romans cleared out North African vegetation for their grain crops. **Upon deforestation, moisture input from the Mediterranean had stopped, drying out the entire North Africa.**

Civilisations abandoned their dried crop fields which were taken over by the local nomad goat herders. As desertification progressed in North Africa, people specialised as goat herders and camel traders. Goats ate all vegetation that tried to survive on seasonal moisture, while people cut the last trees for fire. In the East, Somalia used to have a wet monsoonal climate that supported forests until 1000 years ago. As North-Africans lacked trees they had cut for fire, a demand for charcoal aroused, supplied by the Somalians. A tradition of charcoaling their forests was formed in Somalia, goat herders then using the cleared land. Pastoralism is more suitable to drylands than growing crops, but goats destroy all vegetation (feedback). Pastoralism is also a more comfortable occupation, children and women doing most of the work. Somalia used to have a powerful monsoon supplied by abundant moisture evaporated in the Indian Ocean. As forests disappeared, the climate of Somalia dried out and the intense monsoon mostly stopped. That monsoonal rain that fed the Nile in Ethiopia had diminished, reflected in Egyptian civilisation decay. As deforested Somali land further degraded due to goat pastoralism, population stresses appeared. Therefore, piracy became a traditional trade in Somalia in the past 500 years, as result of deforestation. Climatologists consider the above a natural, cyclical, tropical process amplified by carbon gasses emissions.

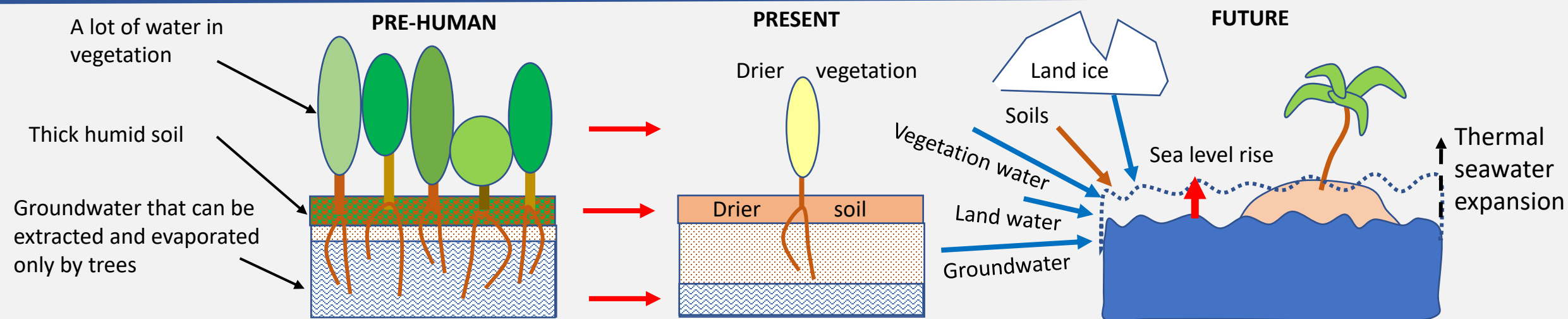
ASH power increases as it dries out vegetation from larger areas and produces more sand by soil erosion. People were pushed south by the advancing sand, creating the Sahel and its socio-economic problems. The ill-designed African Great Green Wall was supported financially in 2022 despite the 2020 correct advice *[24]. Some misinformed African community leaders inform their population that trees would enhance drought [87]. Thus Sahel people cut the remaining trees to stop them evaporating the water needed for their goats' grass. By exceeding the tipping points, avalanche desertification advances to the south with the dominant wind. Desertification now threatens Central Africa, which through mismanagement can become as dry as Somalia.

The further decrease of the water cycle in Central Africa will have grave consequences for the global climate.



The originally clear, now muddy rivers carry the dark soils to the ocean, while the remained light-colored, degraded land is visible from space.

The largest loss is that of the irreplaceable soils, because only thick soil can support large trees which could restore climate.



THERE IS MAJOR DAMAGE TO EARTH AND TO LONG TERM HUMAN INTERESTS DUE TO IMPROPER MANAGEMENT.

5. THE PROPOSED CONSOLIDATED CLIMATE CHANGE THEORY (CCCT)

The Reason for a Consolidated Climate Change Theory (CCCT) is that using exclusively any of the theories hampers correct action on other theories lines.

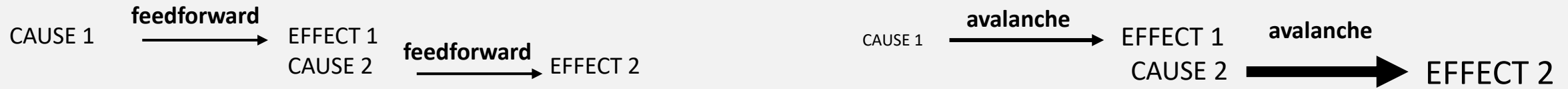
The purpose of the CCCT is the theoretical balance between TOA and ground processes and the applied study of regional climates towards their restoration.

The CCCT includes properly validated information from all theories (see Annex 2), to which it adds new insights.

Suggested Principles of the CCCT:

- 1) The relative magnitude of CET and LUT processes change spatially and temporally; none is considered universally dominant.
- 2) CET is useful for assessment of the long term, global TOA energy parameters, while LUT should manage the near ground, medium term regional climate.
- 3) Given the differences between the two systems (page 9), CET and LUT should not interfere or take precedence over one another, but co-operate.
- 4) The assessment of climate issues should be based on open, interdisciplinary and independent scientific debate, not on the number of similar opinions.
- 5) Conceptual simulations and the associated basic calculations take precedence over computer simulations and modelling when they give divergent results.
- 6) Direct, local observations and measurements take precedence over modelled interpretations of remote sensing, and serve to validate the latter.
- 7) Properly validated, coupled surface-atmosphere simulations and fine-grid GCMs would connect CET and LUT in a well-balanced and effective CCCT.
- 8) The self-trained, independent, AI CLIMATE EYE *[94] could produce said fine-grid GCMs to accurately model regional eco-climates and guide their recovery
- 9) Change versus the natural state and burning of organic matter (including fossil fuels) should be avoided. Solar radiation geoengineering should be banned.
- 10) Regional climate management should be devised considering all significant information and adapting it to regional biophysical and economic conditions.

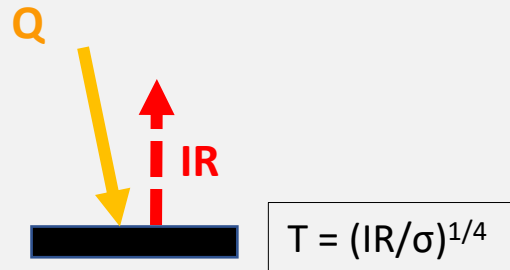
CET continues studying the long term TOA global climate, LUT should manage the near ground, medium term regional climate, while CCCT should connect both through fine grid GCMs performed by a self-trained, independent AI CLIMATE EYE *[94], or, before those become available, through conceptual simulations and basic calculations, to maximise confidence.



Distinct from “feedback” used in climatology, we introduce the term “feedforward” from systems science, where the reaction does not return to the initial causal element, but is transmitted forward to another one. Feedforward is preferable to “chain reaction” because a chain cannot exert force in the forward direction. Additionally, for cascading processes which are close to the tipping point, we suggest the term “avalanche” for a feedforward with amplification (pages 18, 32). This phenomenon is better described through the theory of self organized criticality [7], where locally-locked energies are subsequently triggered as an avalanche.

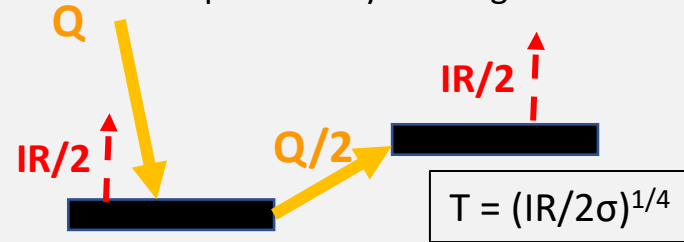
Conceptual tools that need verification and integration with the known ones*

Classic emission



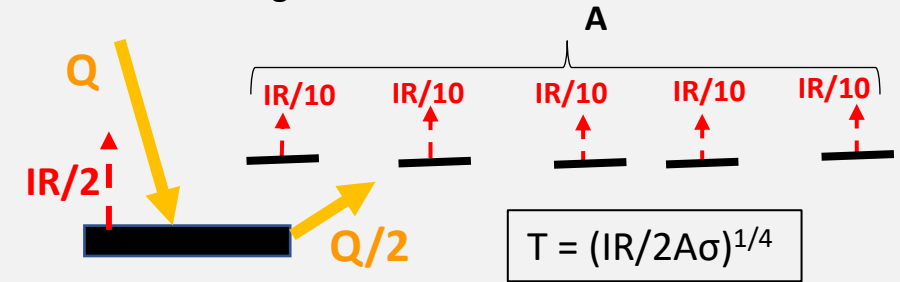
Emission temperature of the received heat Q is according to the Stefan-Boltzmann law

The Divided Heat Emission (DHE) decreases emission temperature by dividing the heat



Emission temperature decreases if Q is divided among two or more objects that emit independently (e.g. ground and air)

Divided & Dispersed Emission (DDE) further decreases temperatures through an emission area larger than the area that received the heat.

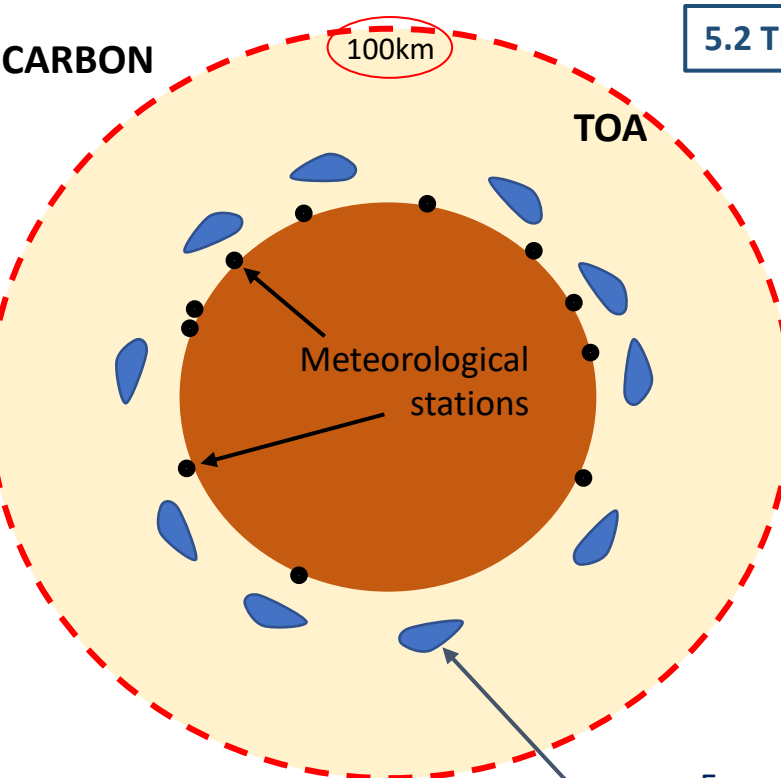


Emission temperature decreases further if the object shares its heat with another object like water that is then dispersed over a larger infrared emission area A . This is similar but additional to the known “emission in layers” mechanism.

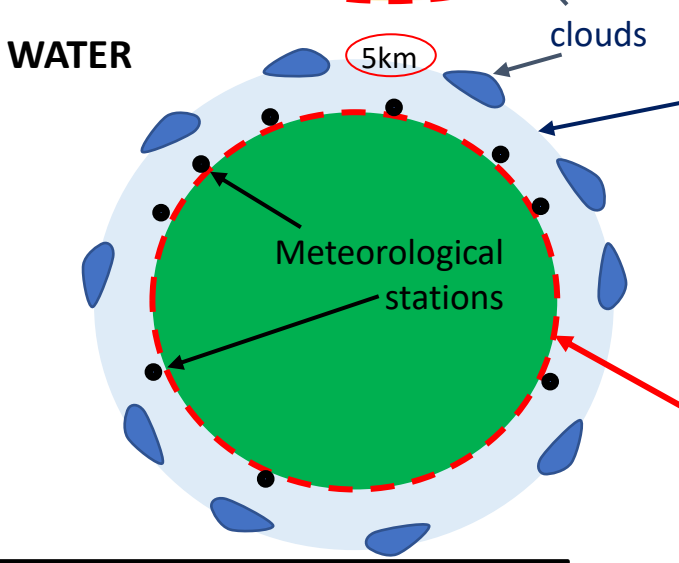
Heat is dispersed in the atmosphere between multiple agents: ground, vegetation, water liquid or vapors, air layers, etc., all emitting infrared radiation through mechanisms like DHE and DDE. The more heat is divided and dispersed, the lower is its emission temperature in the lower zone of the Earth.

***NOTE:** This is a conceptual schematic, not a derivation of atmospheric emission. Real atmospheric emission depends on: the vertical distribution of temperature and absorbers, the optical depth and spectral overlap of gases, cloud and aerosol radiative effects, convective and latent heat transport, and the altitude at which radiation escapes to space. The DHE and DDE diagrams are therefore presented as **conceptual tools** to illustrate why dispersed heat emission occurs at lower temperature than concentrated emission. They are not proposed as replacements for existing radiative–convective models. They are intended to make the qualitative point that water, vegetation and soils disperse heat emission, progressively decreasing emission temperatures through latent heat transport and cloud radiative effects. These tools could be useful to create an alternative conceptual view for comparison with the existing tools and their equations.

CARBON



WATER



5.2 THE SYSTEM AND THE ENERGY TRANSFERS OF THE CCCT

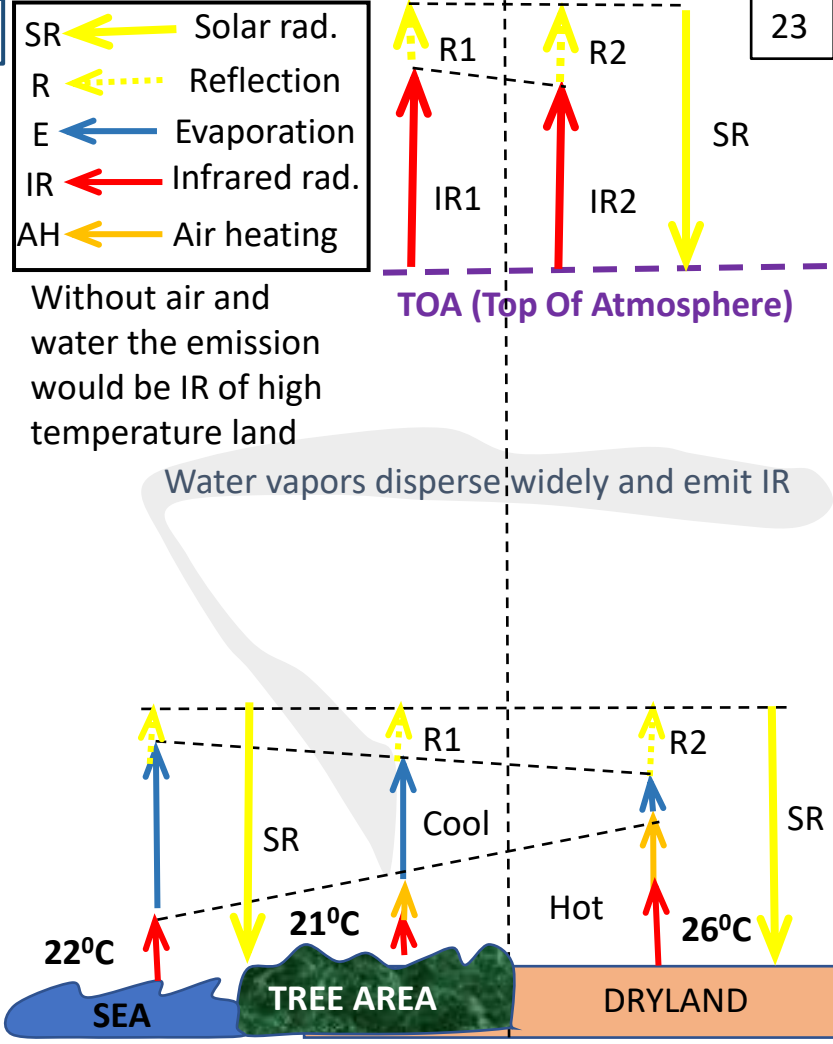
The CET system has diverted policy focus away from regional land-surface actions because its reference system was set too far, at the top of the atmosphere (TOA) to estimate external parameters that hardly correlate to Earth real processes.

For management purpose, The CCCT system is the Anthroposphere between the ground and the low clouds, where the climate happens, all the interests of our society are, and the meteorological stations measure (they are the reference system of global warming). The CCCT also includes the carbon gases effect in and above the Anthroposphere .

Most of this century's studies consider that due to their low albedo and water evaporation enhancing the greenhouse effect, trees [46] and water [2] would warm the planet, thus they would be undesirable. However, we state an albedo paradox: "Dark colour oceans and forests are actually cooler than light-colored deserts". And the ocean is not microclimate.

In fact, before humans, almost all land was covered with trees, the land was much wetter and the climate cooler and more livable. Even now, meteorological stations record average air temperatures of 22°C above water bodies, 21°C in forests, 23°C in fields and 26°C in deserts [45], confirming millenary human experience and wisdom.

In figure, the dryland has almost no water to evaporate, so solar heat is divided between ground and air and thus IR is emitted as DHE at lower temperature than a single surface. Trees and the sea use most SR to evaporate water, keeping the surface cool; the heat is divided between water, ground and air and moreover, the water disperses over a larger area , thus the IR is emitted through a DDE mechanism at the lowest temperature.



Seas and trees did, and could again keep the entire Earth cool

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10km

High thin clouds

5km
AnthroposphereHuman
Zone

Natural Zone

22°C

WATER

21°C

TREE AREA

DRYLAND

26°C

Town

SR ← Solar rad.
 R ← Reflection
 E ← Evaporation
 IR ← Infrared rad.
 AH ← Air heating

IR3
 R3
 AH3

Hot
 sensible
 heat
 transfer

IR2
 AH2
 E2

IR1
 AH1
 E1

IR4

Low thick clouds

The LATENT HEAT
 BYPASS (LHB)
 mechanism cools the
 ground-clouds interval

It is often stated [2] that trees have a global warming effect because they reflect less solar radiation than bare ground. In reality, due to their high evapotranspiration, large tree areas are covered by low thick clouds [90] about 70% of time, cooling the Earth through the high cloud reflection [25].

Tree areas have a net cooling effect because they are mostly covered by low thick clouds.

Deforestation reduces evapotranspiration, this way increasing the above ground air temperature, and **the recorded local warming, which is part of the global warming.** It also changes the water cycle, resulting in all the symptoms of climate change: droughts, floods, heat waves, storms, sea level change.

Deforestation is a main driver of regional warming and climate change *[24].

In the Natural Zone on the left, the higher evaporation $E1 > E2$ (due to trees and the sea) substantially reduces air temperature $AH1 < AH2$ and the infrared radiation $IR1 < IR2$ compared to the Human Zone, producing a significant, effective cooling. Thus, the coupled action of tree areas, water vapors and low thick clouds creates a **Latent Heat Bypass (LHB)** mechanism that takes the heat from surface level and delivers it through condensation at cloud level. From there, heat is emitted more easily as infrared radiation to the sky. **The LHB mechanism cools the ground and substantially reduces the greenhouse effect in the densest atmosphere layers by reducing to almost zero forest's net infrared emission.**

Deforestation decreases the cooling Latent Heat Bypass (LHB) mechanism

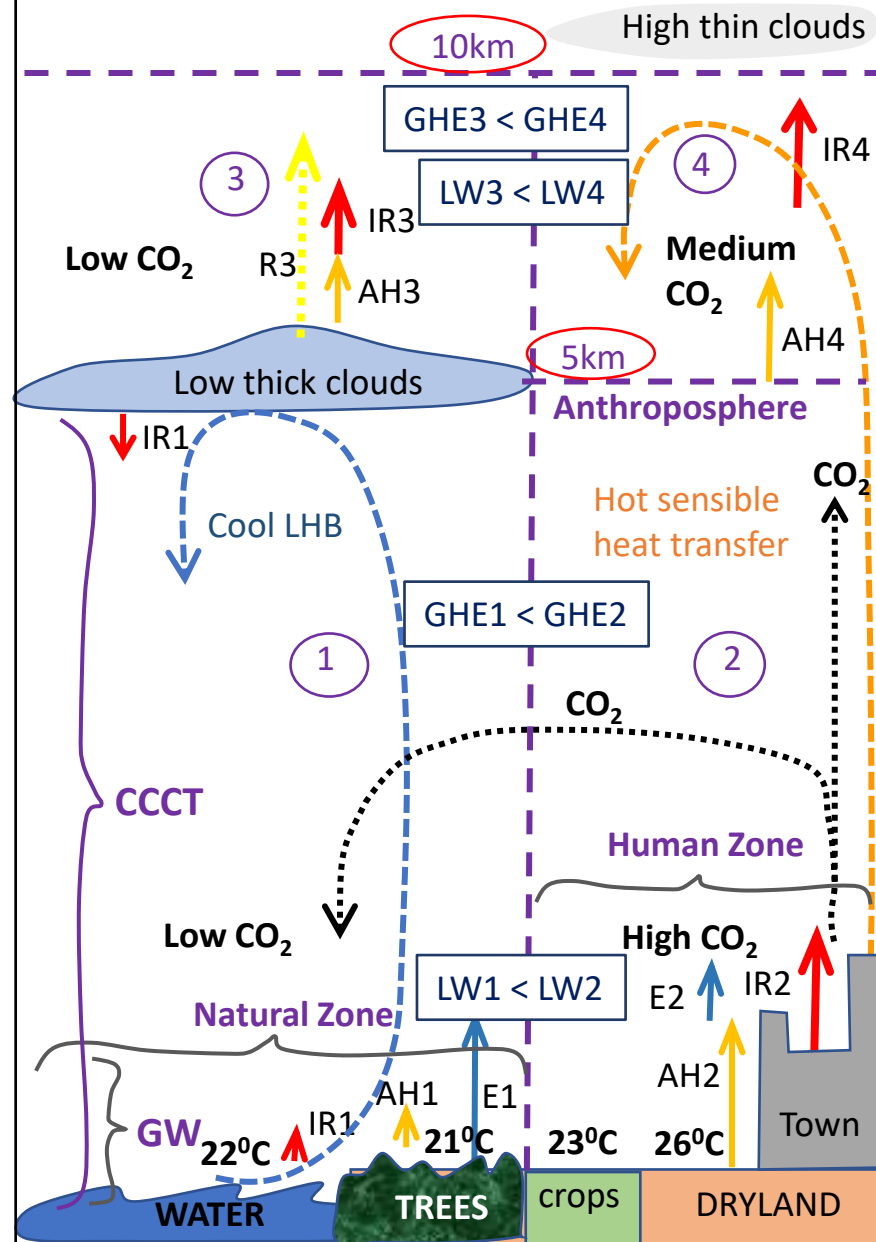
Additionally, due to deforestation, the overheated ground is sending rather small quantities of water vapors in strong hot air currents to high altitude, where they freeze. This way, the high thin clouds are formed by the hotspots of deforestation *[24]. The high thin clouds are known to produce intense global warming, unlike the low thick clouds that cool by reflecting more energy than they trap underneath.

Deforestation dangerously accelerates global warming by increasing the high thin clouds

The idea that clouds would have a net warming effect [84] depends on cloud nature and distribution. For example, measured **average 24h temperatures are about one degree Celsius lower under the low thick clouds than in sunny times.**

Thus, low thick clouds have a net cooling effect.

Deforestation increases the above ground temperature, global warming, and the replacement of cooling low clouds with warming high thin clouds.



Let us do a conceptual simulation in CET style. **We can say that the greenhouse effect increases with both the infrared radiation emitted by the surface and the CO₂ amount in the atmospheric column.** The variations of CO₂ control the greenhouse effect of water vapors according to CET's CO₂ driver principle. In a steady state, the ground-absorbed solar radiation is transformed in energy for water evaporation (E), infrared radiation (IR) and air heating (AH). The latter relates to air temperature, thus Local Warming (LW).

- 1) The Natural zone of the Anthroposphere absorbs CO₂ (so it has a lower CO₂ column amount) and it is shaded by the low thick clouds, thus substantially less solar radiation reaches the ground. The high water evaporation E1 keeps the surface cool and allows only little infrared radiation IR1 and little air heating AH1. Since both the CO₂ amount and IR1 are small here, **the greenhouse effect GHE1 and LW1 are small.****
- 2) The Human part of the Anthroposphere emits and has a lot of CO₂ and is only slightly shaded by the high thin clouds, so most of solar radiation reaches the ground, where the small water evaporation E2 results in high infrared radiation IR2 and solar air heating AH2. Since the CO₂ amount is high here, and IR2 is large, **the greenhouse effect GHE2 and the LW2 are the largest of the four zones.****
- 3) The top part of the Natural zone is dominated by the high reflection R3 that removes most of incoming energy without climatic outcome. The CO₂ amount is low at this altitude and water is mostly condensed in the cloud below, while IR3 is small as detected by satellites. Therefore, **the GHE3 is the smallest of all four zones. Air temperature and LW3 are also the lowest in this area,** as it includes the altitude cooling effect (lapse rate), while receiving little convective heating from below.**
- 4) The top part of the Human zone is dominated by the hot air currents that create the high thin clouds. It has medium CO₂ amount, while IR4 is much larger than IR3 according to satellites. **Therefore, GHE4, the air temperature and the LW are higher than in zone 3.****

We have to remember now that global warming GW is the average of all local warmings LW

CONCLUSION: The latent heat bypass (LHB) mechanism of water in the lowest atmosphere strongly reduces the excess infrared radiation and therefore the greenhouse effect in the densest layers of the atmosphere. This also lowers the measured local air temperature [45] and the LW, while the remaining heat after the large cloud reflection is emitted upwards from the clouds at a lower temperature.

This way, the CCCT improves the representativity of CET by showing that the greenhouse effect and the measured local warming are smaller in areas with more water and more large trees.

1. The latent heat flux created through evapotranspiration of forests varies widely between 90W/m^2 in the tropics and 30W/m^2 in the polar regions, resulting in an average of 60W/m^2 with the provision of constraints for seasonality and water availability. Considering an average latent heat flux of 20W/m^2 for cleared out areas, it results a deforestation heating or reforestation cooling of about 40W/m^2 averaged globally with the same constraints.
2. Therefore, every 15km^2 of deforestation at low latitudes heats the surface as a virtual power plant (40W/m^2 deforestation heating $\times 15,000,000\text{m}^2 = 600\text{MW}$).*
3. Past tree cuts of $3 \times 10^6 \text{ km}^2$ in USA heats it continuously as 200,000 virtual power plants. The total USA real capacity is only 1,500 such virtual power plants.
4. IPCC states that human-made global warming due mainly to carbon gases is 1.1°C . We can compare it with the $1.5 - 2.5^\circ\text{C}$ for the 2m average surface temperature difference between deforested and forested regions [36]. Thus, we can effectively compensate the regional warming with dense, tall, syntropic tree planting.
5. A deforestation heating of $1/6$ of solar radiation for most of Earth's land area (see page 13) means significant global warming, that now continues and amplifies.
6. The IPCC conclusion of 2.17 W/m^2 RF at TOA due to carbon emissions translates through its sensitivity into about 4W/m^2 at ground level [20], and by comparison with the above 40W/m^2 of regional cooling from tree planting indicates that **restoring tall, dense tree cover is a much more powerful tool for immediate regional climate cooling than waiting for global CO_2 reductions to start and take effect all over the planet**. Additionally, tree planting effectively sequesters CO_2 .

5.6 THE CCCT CAN CLARIFY THE CLIMATE CHANGE DEBATE

1. In the newer IPCC definition [92], climate change is **a change in the climate properties** that persists for an extended period, and may be due to natural internal processes or external forcings like solar cycles, volcanic eruptions and persistent anthropogenic **changes in the composition of the atmosphere or in land use**.
2. The change in climate properties is essentially regional, and the artificial averaging to characterize it as global makes it lose regional meaning and power range.
3. Therefore, an improved general statement would be **"Human changes of atmosphere or land"**, referring to all changes by humans even before 1750.
4. This is not only correct semantically, but by including the deforestation (land use) changes since prehistory, **it makes anthropogenic climate change irrefutable**.

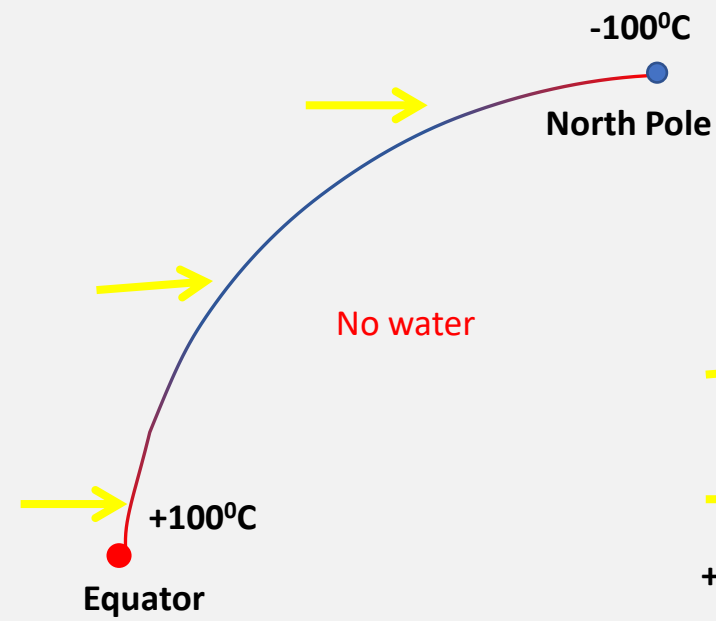
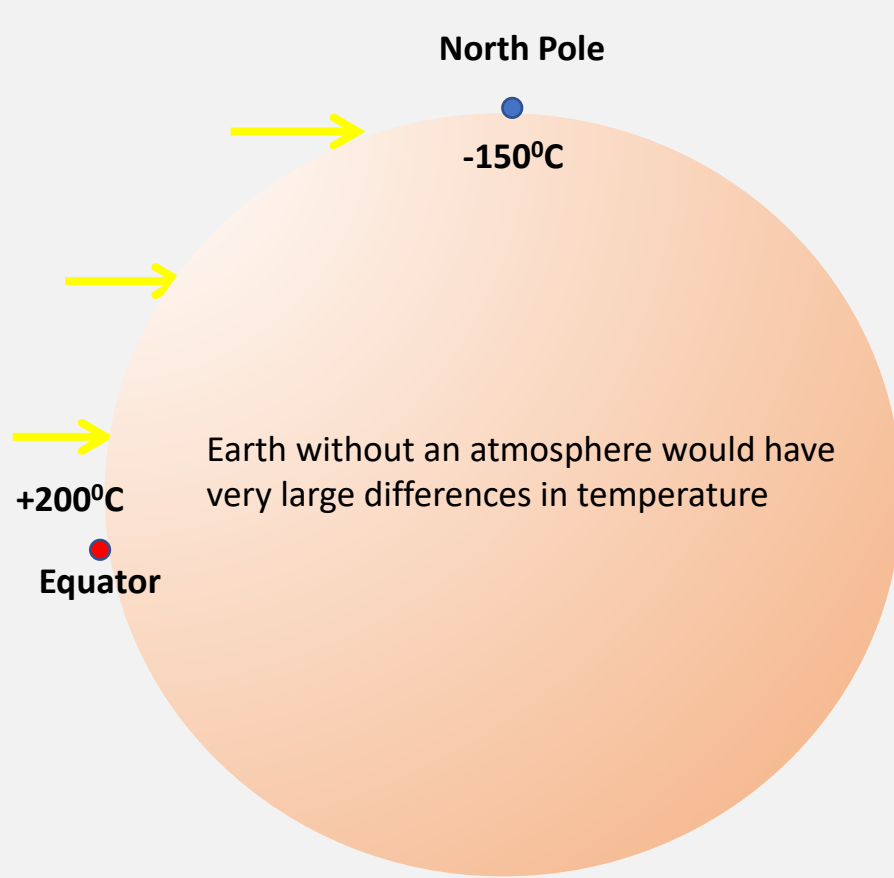
* NOTE: This simple comparison shows production of infrared radiation that enhances the GHE and of air heating resulting in GW and increased air convection.

Thus, we could reverse regionally the carbon emissions effects with the evaporative effect of planting dense trees, which additionally sequester carbon dioxide.

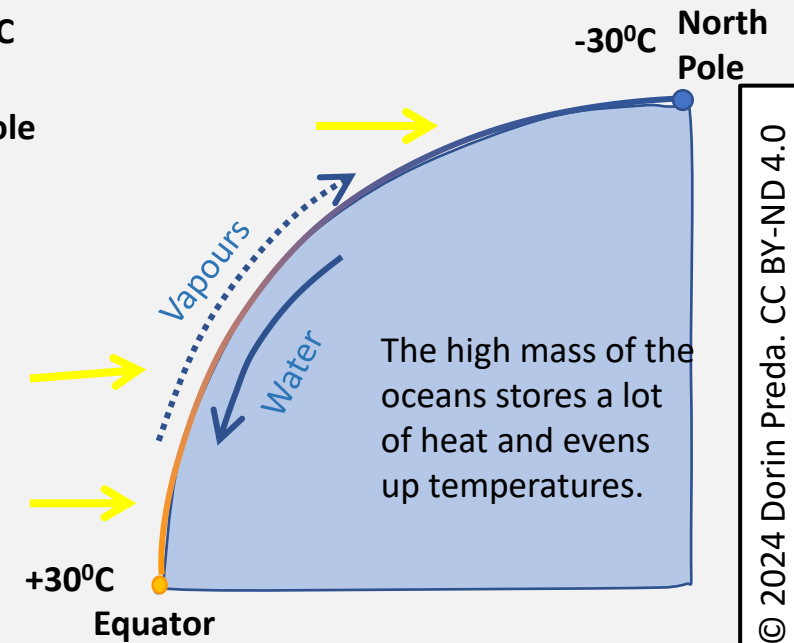
- Heatwaves are due to deforestation lowering evapotranspiration and cloud cover and increasing the greenhouse effect through the infrared radiation.
- Drought is produced by deforestation raising temperatures, decreasing relative humidity and precipitation; it is amplified by HAC and ASH (Annex 6).
- The tornadoes which are generated by the sharp rising of the slabs of ground hot air of deforestation do not start in the cool and dense forests.
- Floods are due to (a)biotic moisture pumps discarding excessive atmospheric moisture produced at present through increased ocean evaporation due to global warming in which deforestation has a role. Deforestation also decreases soil water absorption, amplifying flood effects (page 20).
- Sea level rise is driven mainly by thermal expansion of ocean water and by melting of land ice, both primarily caused by greenhouse warming. Deforestation contributes through its surface air and wind warming effect aiding in land ice melting, through vegetation water, soil water and groundwater losses to the sea, and by favoring soil erosion and deposition into the sea (page 20).
- Forest fires are due to deforestation drying, to deforestation HAC, to forest clearing and thinning (that increases sunshine, wind and dryness), to ground clearing of thick wet residues, to groundwater extraction from tree roots, to controlled and cultural burns, and to the desire of deforestation (Annex 5).

5.8 THE CCCT PROVIDES A REALISTIC SOLUTION FOR CLIMATE RESTORATION

- CCCT reconciles CET and LUT and bridges them with improved conceptual models and fine-grid GCMs operated by dedicated self-trained AI CLIMATE EYE
- Since climate change symptoms are due to imbalances of water and vegetation, we can restore the climate and the water cycle by tree planting.
- Large scale syntropic tree planting [95] downwind from the coasts can regionally offset the warming due to carbon gases and decrease it globally through carbon sequestration from the atmosphere into restored soils and sustainable and beneficial useful tree plantations *[24].
- The LULCC climate studies, and our work *[25] show real climate restoration means that can bring high benefits to the dominant interests (Annex 3).



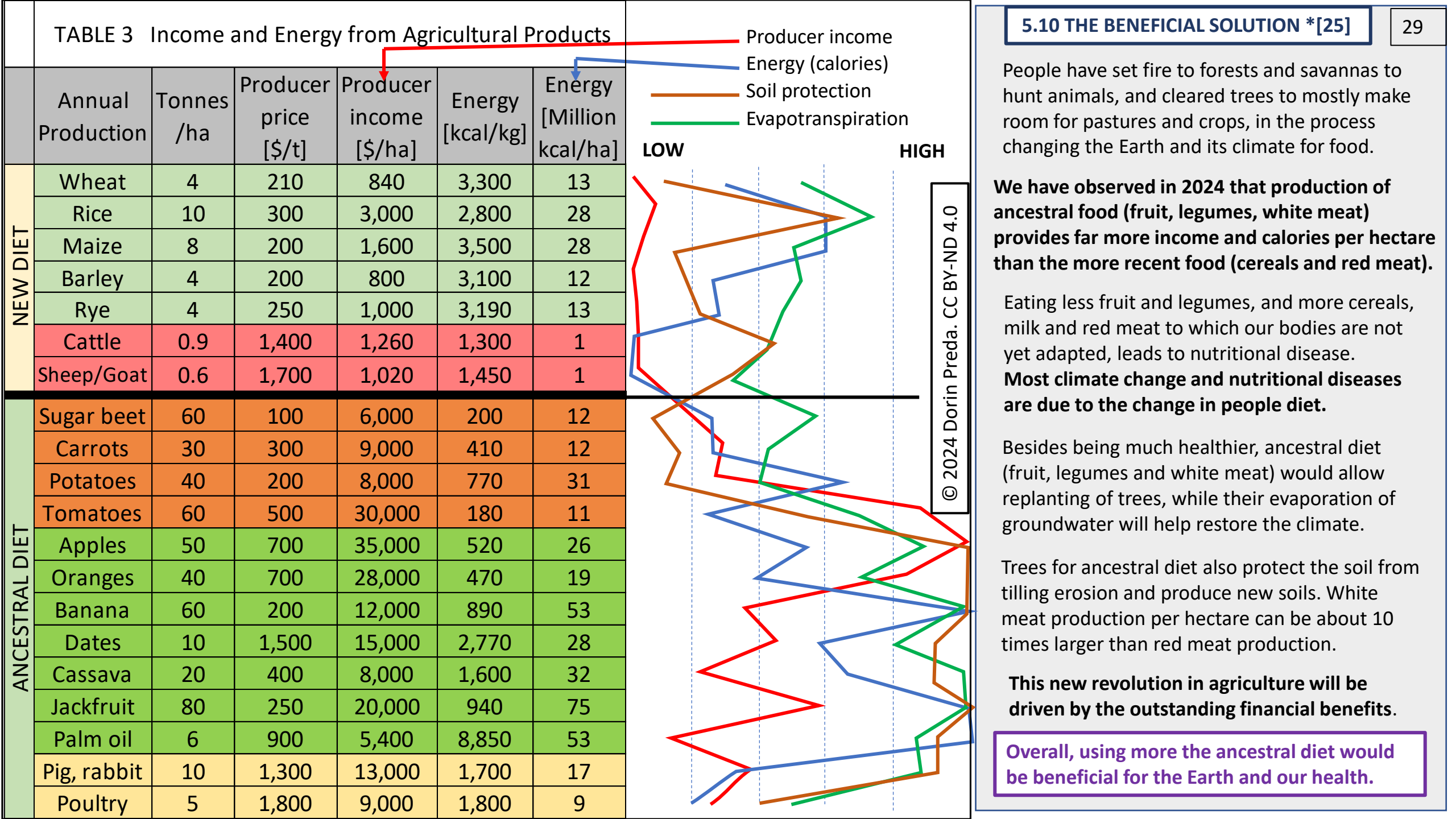
An atmosphere made out only of dry air would have too large temperature differences for life because the troposphere is thinner than the above line, and air barely transports heat (it is a heat insulator).



Water is the most powerful heat transporter in the atmosphere due to its evaporation-condensation cycle. It lowers equatorial temperatures and raises polar temperatures, allowing life to exist.

We assert that the major cause of regional warming in the medium-low latitudes is deforestation; it decreased the local latent HBS, and increased the greenhouse effect in the most energetic belt of the Earth through higher infrared radiation and increased carbon dioxide from fossil fuels used mostly for artificial heating of deforested areas in the higher latitudes (see page 25). The excess heat from low latitudes was pushed to the high ones (see page 17). Trees cool better through higher shade and evapotranspiration than grasses because they can extract more and deeper groundwater, and can attract precipitation by emitting organic compounds. Trees protect from erosion and create more organic soils, sequester more carbon dioxide and can give larger quantities of useful produce.

For millions of years, through water, trees created and enhanced life on Earth. We should adapt our Earth management accordingly.



5.11 DETAILS ON THE SUGGESTED AGRICULTURE CHANGES *[25]

Pastures use most agricultural land, thus are a large cause of climate change through CO₂ emissions, low evapotranspiration, and through soil erosion. Replacing most pastures and grain crop fields with orchards and other useful trees in syntropic [95] plantations would greatly increase income and land value. Lines of useful trees in the remaining pastures and grain crop fields would provide ground shade at low latitudes, boost productivity, and improve soils. Trees provide a wider variety of fruit, nuts and vegetables with greater nutritional benefits than grain crops and much larger production per hectare. Even production of white meat using tree fodder is many times more financially beneficial than red meat production, which also leads to pasture soil erosion. The single grain crop that is financially beneficial and not detrimental to health is rice, which also protects soils and has high evapotranspiration for climate.

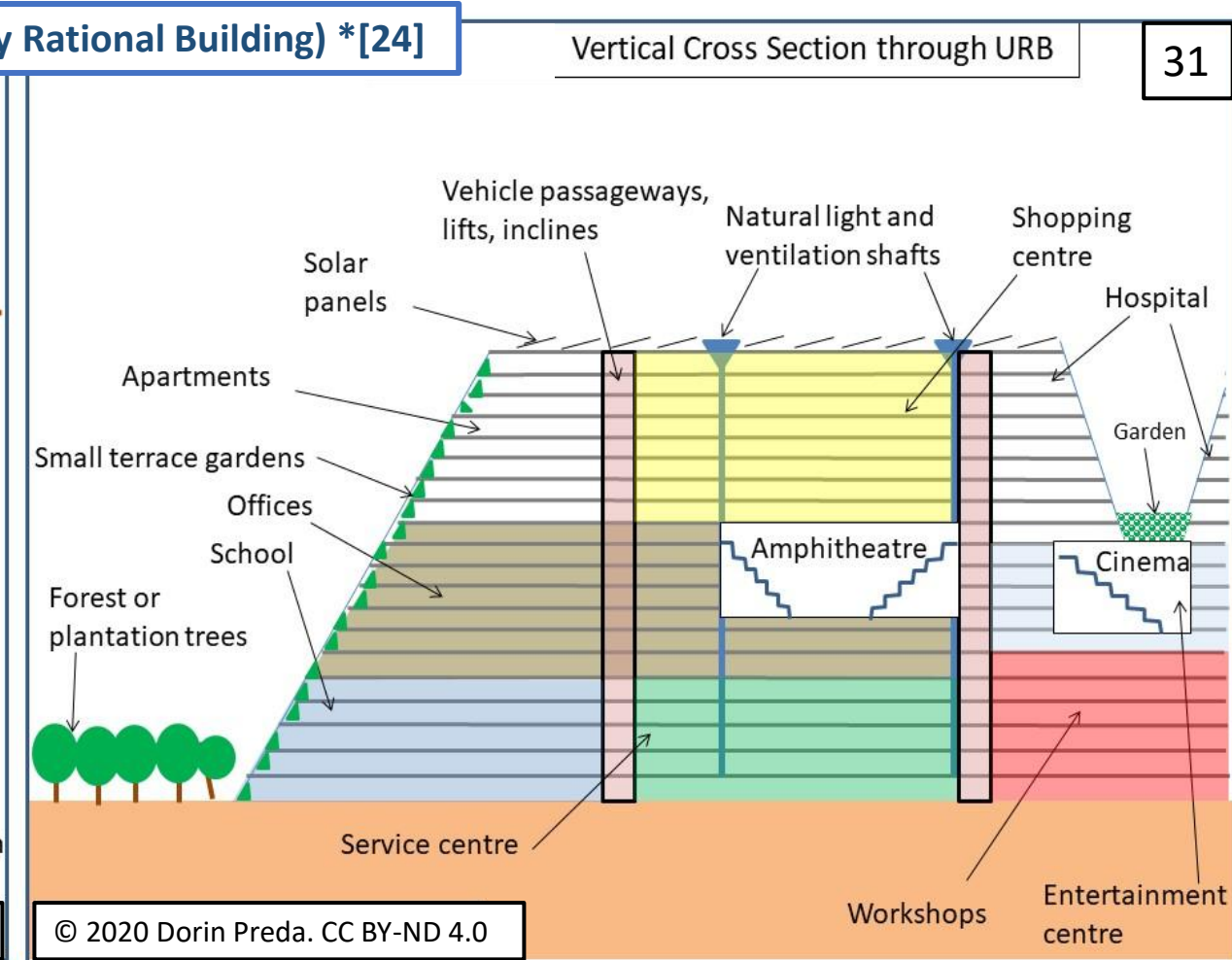
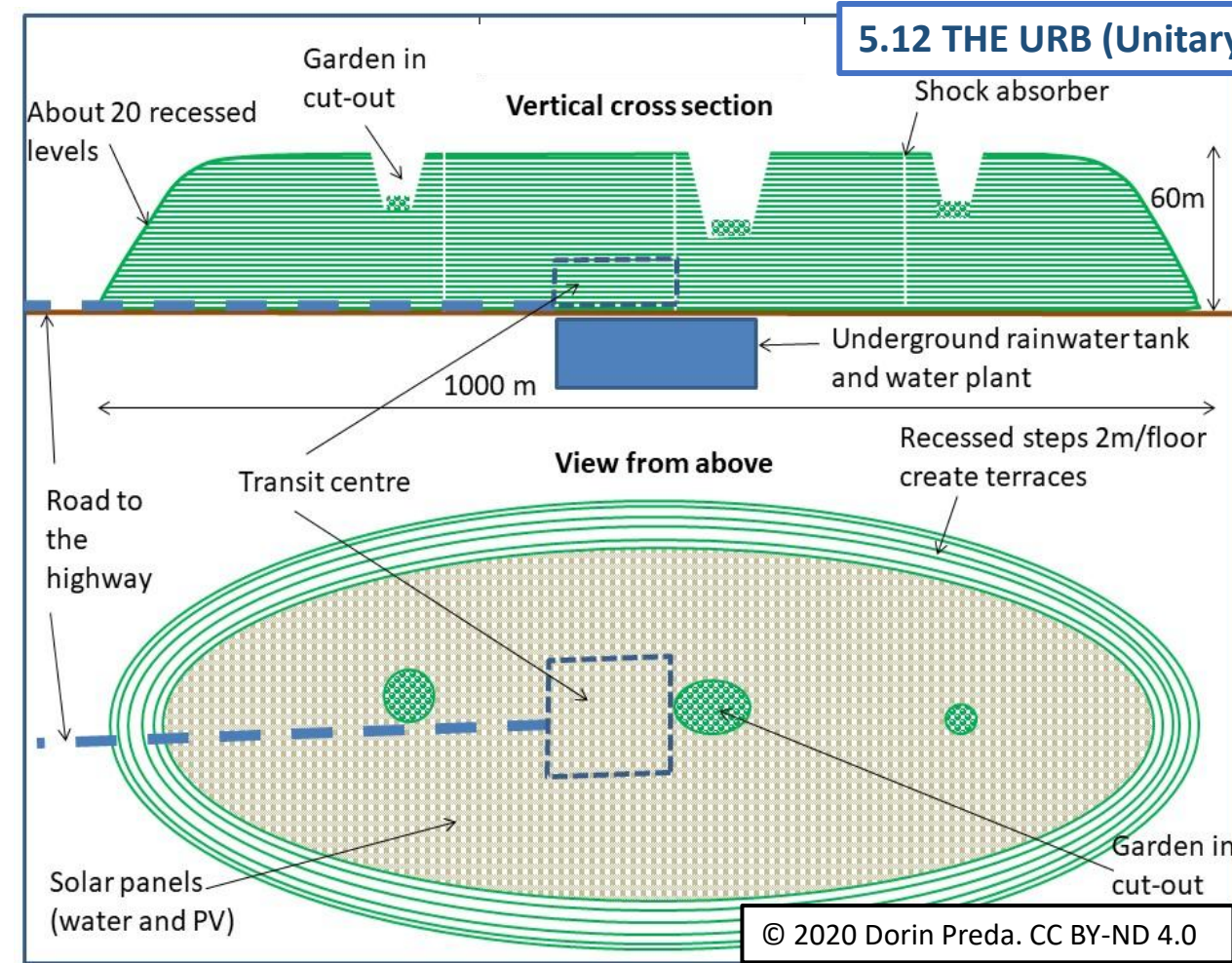
Probably the main reason for switching in prehistory from fruit to grains was the possibility of longer storage time of the latter. Therefore, to increase the ancestral diet and decrease the new diet, it is necessary to provide economic methods of fruit preservation and storage. A direct method is **drying** at medium-low latitudes with solar thermal methods and at high latitudes with wind-driven heat pumps. **Freezing** in batches can be done in large freezer warehouses that have high thermal inertia, thus they can rely on the use of the intermittent renewable energy. **Conserving and pickling** in suitable size recyclable containers is an energy efficient preservation method of fruit and legumes for food or animal feed.

Former pastoral or grain farms planted with fruit trees could have large warehouses with preserved fruit near their white meat animal barns or ponds.

Due to their much higher production per hectare, orchards will provide agriculture production growth without being necessary to deforest more lands.

It is also necessary to plant as many trees as possible in settlements and along highways, or use hanging green canopies where it is impossible to plant trees. The backbone of this new strategy are fruit trees and other useful trees, which require work only for harvesting, possibly through mechanisation/automation. This revolution in agriculture requires the work and supervision from an increased, dedicated population that has to live on or near those lands (see next page).

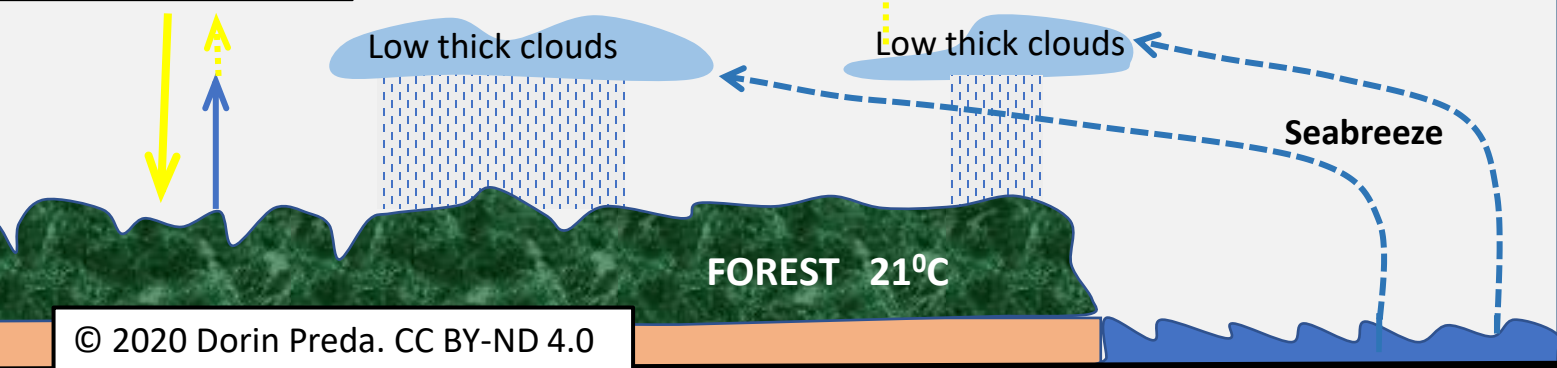
Economical and environmentally friendly tree products preservation is essential for the agroforestry success.



- **The URB [7, 8] unites many buildings of different destinations into a large structure which optimizes space and reduces tens of times the settlement's footprint.**
- This way, the URB can be surrounded by parks, forests, plantations, or orchards that improve local climate, are productive and protect the natural environment.
- Since distances are small, there is no need of cars inside the URB, so people could walk or use PEV (personal electric vehicle), while using their cars outside URB.
- Each apartment has large terraces, open towards the wonderful green surroundings of the URB. There is no chemical, sound or visual pollution for residents.
- All apartments have glass walls towards the open, wide, outside landscape with perfect privacy and aesthetics, unlike present town houses open towards streets.
- **URBs can be built easily with existing construction methods and materials, cost far less than separate houses and buildings and can last hundreds of years.**
- URBS can be quickly built from glass and composite materials including basalt fibres, expanded foams, while apartments can be reshaped by moving internal walls.
- Being simple to build (though large) and lasting hundreds of years, total capital cost per user of this new type of building is low, making it affordable and beneficial.
- **Advantages of URBs: low land specific footprint (can stop HAC on the coast), low specific capital cost, very low running cost and the low transport costs.**

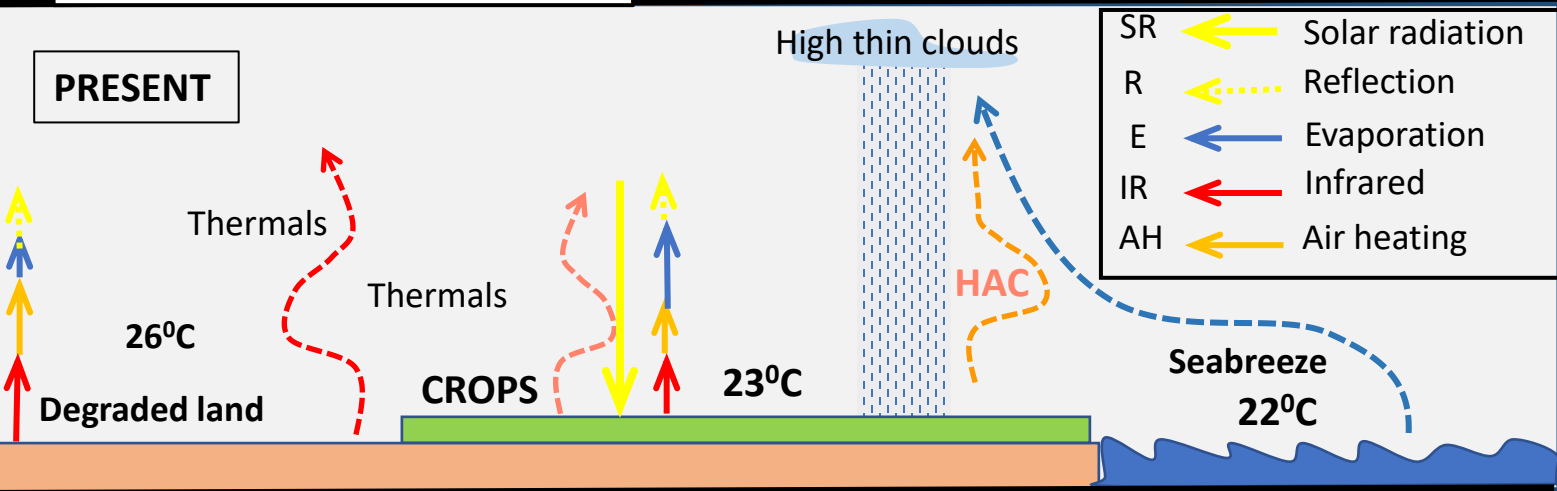
BEFORE HUMANS

5.13 THE AVALANCHE GREENING AND COOLING (AGC) *[24]

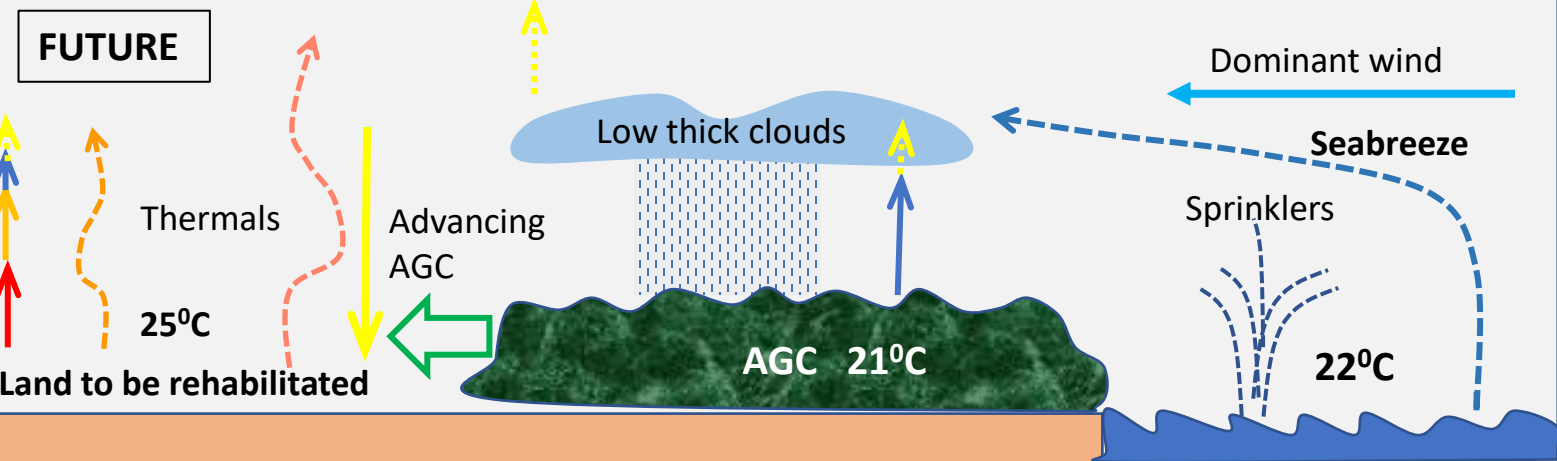


Before coastal development, the forest used all absorbed solar energy to evaporate water and did not heat the air, thus the forest was cool. Marine moist breeze easily passed over the coast and delivered water to the forest through biotic moisture pumps [27] and night humidity pumps. This mechanism is most powerful in medium-low latitudes. **The climate was cool and wet.**

PRESENT



After coastal deforestation less water is evaporated, hence most solar energy is used to heat the air and increase infrared radiation, thus the greenhouse effect. The formed hot air curtain (HAC), prevents the marine breeze from penetrating deep on the land and most of it is deviated. Some coastal rain occurs due to the marine humid air being pushed upwards by the thermals. In total, less marine moisture enters the draught-stricken land. **The climate turned hot and dry [28].**

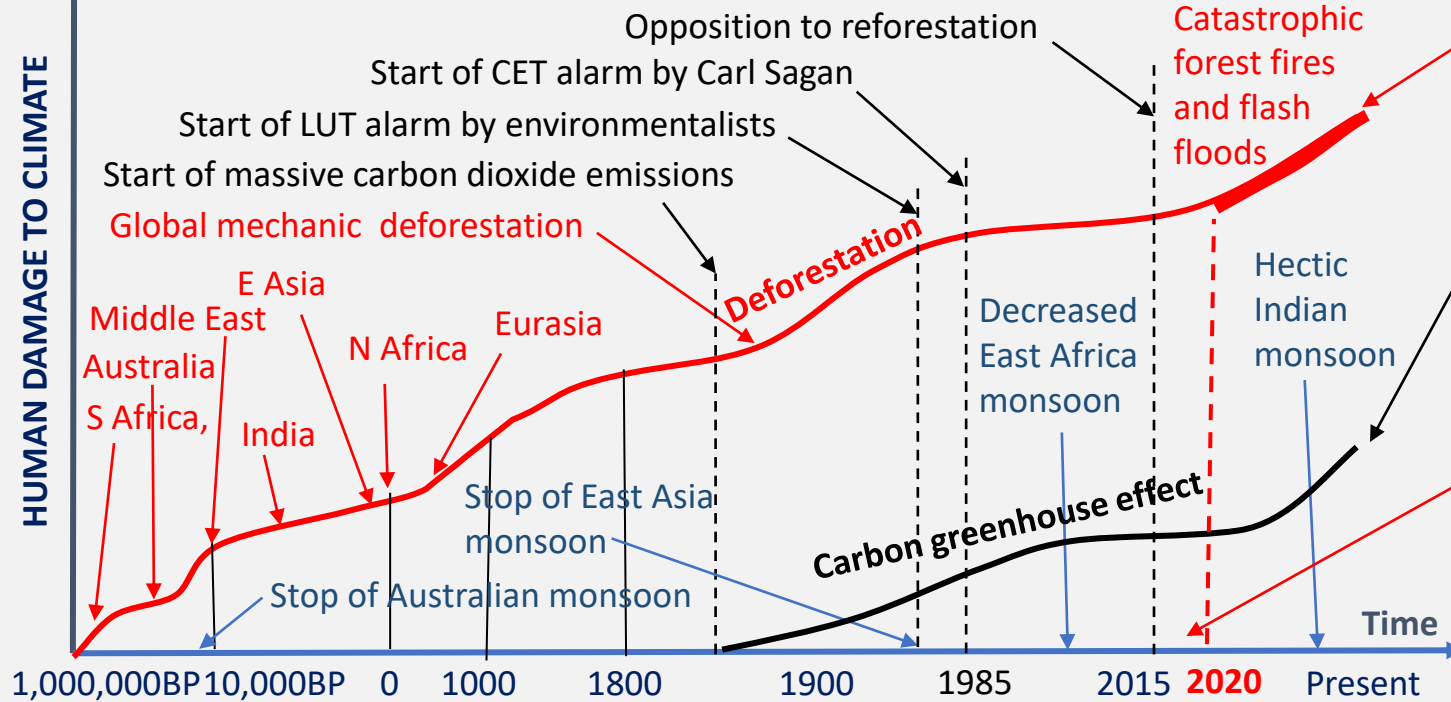


The avalanche greening and cooling (AGC) is land and climate restoration in medium-low latitudes that plants useful trees under **certain bio-economic, agrarian and hydrological rules** and combines them with crop lines and reconstituted forests. This re-creates moisture pumps with the water bodies and the atmosphere and restores water cycles.

Once started, the coastal AGC could advance inland through the excess water it generates and through self financing from the profits it generates (Annex 4).

1. As shown above, land degradation and climate change happened because of human interests mostly for food, resources and settlements (real estate).
2. **These are the most powerful interests in society, and a change in agriculture and land development is possible only if it is more beneficial.**
3. **As groups of (coastal) sprawling settlements degrade in time, they can be replaced by URBs with smaller land imprint, surrounded by green cool areas.**
4. Present low latitude drylands can be transformed into valuable land with proper AGC projects started downwind from the coastline (Annexes 4, 6 and 7).
5. **This great increase in useful land will allow new land development and a boost in economy and in population housed in rational settlements like URBs.**
6. **Contrary to the austerity of emissions reduction, all sectors of the economy can benefit from this large development, triggering an economic boom.**
7. Growing crops in tropical latitudes critically requires to shade the ground with north - south lines of useful trees that also create and protect new soil.
8. **It is essential to plant trees in the coastal areas, which are now mostly covered by settlements and they dry their inlands through HAC and ASH.**
9. In present settlements, where no more trees can be planted, green canopies or reflecting and artificial evaporation structures must stop overheating.
10. Denser, taller vegetation on land is wetter, and when combined with private property of useful trees will prevent the start-up of catastrophic fires.
11. **As the climate improves by restoring the water cycle and sequestering CO₂ in trees and soil, carbon emission reduction through URBs becomes a bonus.**
12. The high orchard productivity allows halting deforestation of Amazonian, Central African and other low latitude lands, preserving climate and biodiversity.
13. **Large-scale land rehabilitation with avalanche greening and cooling (AGC) in Africa and Australia would significantly re-balance global climate.**
14. As intertropical sea evaporation returns as rain to intertropical lands, the overheating and flooding of higher latitudes will cease.
15. Cooling the high latitudes will re-freeze them (the Arctic, permafrost, glaciers), and would reverse sea level rise by restocking water on land.
16. The increased land productivity would free land, making it available for setting up large Natural Reserves to conserve regional climate and biodiversity.
17. The present socio-economic tensions due to climate change would dissipate because all parties would co-operate for mutual benefit.

The climate can be beneficially repaired through revegetation without the dangerous solar radiation geoengineering.



Deforestation has dramatically increased the Earth deserts, their erosion erasing proof of the state before humans. Human action can be seen by comparing different lands on the same latitude.

The greenhouse effect is driven by the increased infrared radiation of deforestation, and is aided by its carbon emissions, and that from fossil fuels, thus the greenhouse curve has similar shape with the curve of deforestation. However, due to feedbacks, the greenhouse effect increases faster than deforestation, thus we risk it start a runaway greenhouse effect due to recent forest and peat fires and to ocean warming.

The catastrophic forest fires that started in 2019 and marked 2025 (Annex 5) and the associated excessive floods (Annex 8) indicate that a dangerous tipping point was overpassed by destabilizing the very powerful global water cycle that is also threatening the crucial Amazon and Congo basins (Annex 9).

WE MUST URGENTLY PUT ASIDE ANY CONTROVERSY AND REPAIR THE LATENT HEAT BYPASS SYSTEM AND DECREASE CO₂ IN THE ATMOSPHERE THROUGH PLANTING USEFUL TREES.

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OUR REALISTIC METHOD:

- 1) Prevent forest and grass fires by addressing their causes of regional dryness and ignition and taking proper prevention measures.
- 2) Stop deforestations of old grown forests especially at low latitudes by offering other beneficial alternatives to socio-economic pressures.
- 3) Plant fruit tree lines alternating with legume beds in pastures and crop fields, to improve food productivity and soils, climate and our diet.
- 4) Plant as many syntropic orchards to produce feed for free range white meat animals grown in nearby barns, while local warehouses preserve the feed.
- 5) Plant as many trees as possible in present settlements, and complement them with green canopies or artificial evaporative cooling in too dense settlements.
- 6) Start downwind AGC projects in drylands to create new soil, reverse desertification, improve regional climate and further reduce atmospheric carbon (Annex 4).
- 7) Start building in URB style, which uses far less energy for heating/cooling/transportation; this will effectively reduce the future carbon dioxide emissions.

Despite the change 20 years ago from LUT to CET, anthropogenic carbon gases emissions continued to grow, along with an **increase in climate change due to:**

1. Deforestation decreased the water cycle **at medium-low latitudes through $40\text{W}/\text{m}^2$ of land heating**, and produced hot air currents, which evaporated most reflective low clouds and pushed vapors at altitude, producing warming high thin clouds. The altered water cycle has created all symptoms of climate change.
2. Deforestation has increased the infrared radiation, which acts upon the fossil fuels carbon gases to produce **$2.2\text{W}/\text{m}^2$ of surface carbon gases warming**.
3. Based on the Deforestation Climate Change Theory [54][24], which pushed the anthropogenic climate change much earlier than 10,000 years [26], and than the industrial era [2], the CCCT shows that the water cycle on land that was damaged by deforestation can be repaired through (syntropic) planting of useful trees.
4. About half of carbon gases from fossil fuels and forest burning now accumulate in the atmosphere, from where carbon can be removed through natural sequestration if carbon emissions are dramatically decreased and, in parallel, through realistically larger artificial sequestration in new useful trees and soils.
5. **CCCT replaces the expenses on damaging solar radiation geoengineering with sustainable and beneficial economic boosting of public and private sectors.**
6. **CCCT bridges the CET-LUT gap with fine-grid GCMs performed by a self-trained AI CLIMATE EYE [94], which could also guide the eco-climate recovery process.**
7. Many local land and climate restoration projects [34 - 44] improved their local climates and **demonstrated the viability of LUT and AGC principles**. They created a progressive grass-roots movement for which CCCT can provide theoretical support for successful Earth recovery, in line with constructive IPCC guidelines.

We could boost the economy, restore the Earth 's land and climate and improve our health by using the CCCT principles and methods

LIMITATIONS NOTE: The CCCT is a conceptual and observational framework based on decades of collective ecohydrological literature, and its mechanisms like the AGC can be tested through mesoscale models (e.g., WRF) and ground-based flux towers. We invite collaboration to test these hypotheses. Updates on the CCCT and an invite to join this initiative can be found at: <https://climatechangetheory.org/the-initiative>

- 1 <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>
- 2 <https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-8/>
- 3 <https://science.nasa.gov/climate-change/causes/>
- 4 <https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-7/>
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- 1) That there would be no man-made climate change: Wrong, because our large land changes force large Nature reaction changes.
- 2) That it was climate change before humans [5]: The man-made changes are more rapid and on other directions.
- 3) That the solar factor would be much stronger than CO₂ [6]: Wrong, how comes it coincided with largest human activity?
- 4) The CO₂ saturation effect would diminish the role of additional CO₂ [7]: Partially wrong, as demonstrated by planet Venus.
- 5) Cosmic rays would influence cloud formation, not humans [8]: Not supported by the spatial and temporal cloud distribution
- 6) The Pacific Southern Oscillation would be much stronger than CO₂ [9]: Yes, but its cycle is much shorter than that of CO₂
- 7) Water has higher concentration and infrared absorbtion than CO₂ [10]: Yes, but this does not mean that CO₂ has no effect
- 8) Most water evaporates from ocean, not due to humans [11]: Yes, but human influence on water precipitation is significant
- 9) CO₂ absorption spectra overlaps with the water one [12]: Yes, but only partially, as CO₂ also has its own window
- 10) Uncertainty due to water models imperfections [13]: This uncertainty of modelling extends on all modelled parameters
- 11) Human influence on water evaporation would be negligible [14]: Wrong, we totally changed the land, which has a major role
- 12) Water has a short residency time in the atmosphere [15]: Wrong, residency time has nothing to do with its greenhouse effect
- 13) Due to water, there would be lower climate sensitivity to CO₂ [16]: Yes, but the CO₂ effect still exists even if it is weaker
- 14) Increased radiative cooling due to increased temperature [17]: Yes, but the loss of heat before equilibrium is smaller
- 15) Could the cloud feedback create an iris thermostate? [18]: Yes, luckily for the oceans, because land deforestation opposes it
- 16) Satellite observations support the iris hypothesis. [19]: As above, but for it to act, an increase in temperature is necessary
- 17) There were climatic changes like the Little Ice Age without CO₂ cause [5]: Yes, because of other causes like the pest, wars
- 18) Palaeoclimatic data show CO₂ being a follower of temperature [21]: Yes, because of other causes like the vegetation effect
- 19) Historic temperature records are unreliable because of urban heat effect [22]: Yes, because of increased deforestation, but the CO₂ effect still exists.
- 20) The CO₂ effect is small, while the climate change effects are large [23]: Yes, because of large man-made vegetation changes; the CO₂ effect still exists .

Correct

Partially correct [Reference]

Incorrect

Therefore, the man-made climate change is real

LAND USE THEORIES (LUT)

- **Land Use Changes, Albedo, Hydrology** (Pielke R. Sr.) [78]: Deforestation/urbanization alters reflectivity (albedo) and water cycles.
- **The Climate-Soil-Vegetation Nexus** (Rodriguez-Iturbe)[68] : Vegetation's hydrological regulation (Ecohydrological Optimality Hypothesis)
- **Ecohydrological Optimality and Evolutionary Adaptation** (Eagleson P.)[69]: Vegetation tends to minimize water stress over time.
- **Dual Regulation and Sustainable Management** (Zalewski M.)[70]: Shift from a structure-oriented to process-oriented thinking management
- **The Biotic Pump Hypothesis** (Makarieva A., Gorshkov V.)[27] Forests create low-pressure zones that draw moist air inland, sustaining rainfall.
- **Latent Processes as Origin of Wind** (Makarieva et al.)[80]: How water vapor condensation influences atmospheric pressure and dynamics
- **Land-Use Changes & Disrupted Moisture Recycling** (Millan M.)[28] deforestation disrupts local "low-level moisture feedback loops,"
- **A Comprehensive Framework for Ecological Climatology** (Bonan G.) [66]: global environmental sustainability through "interconnections".
- **The Deforestation Climate Change Theory** (Preda D.) [24] [25] [54]: Prehistoric to present deforestation strongly changes climate through water.
- **Multi-Scale Vegetation-Climate Feedbacks** (Miralles, Vilà-Guerau, McVicar, and Mahecha)[67]: from local microclimates to global climate.
- **Optimizing Forest Carbon Sequestration and NbCS Effectiveness** (Anderegg W.)[71]: Nature-based Climate Solutions (contribution approach)
- **Economic and Equity Validation of Nature-Based Solutions** (Vicarelli M.)[72]: Nature-based Climate Solutions are consistently cost-effective.

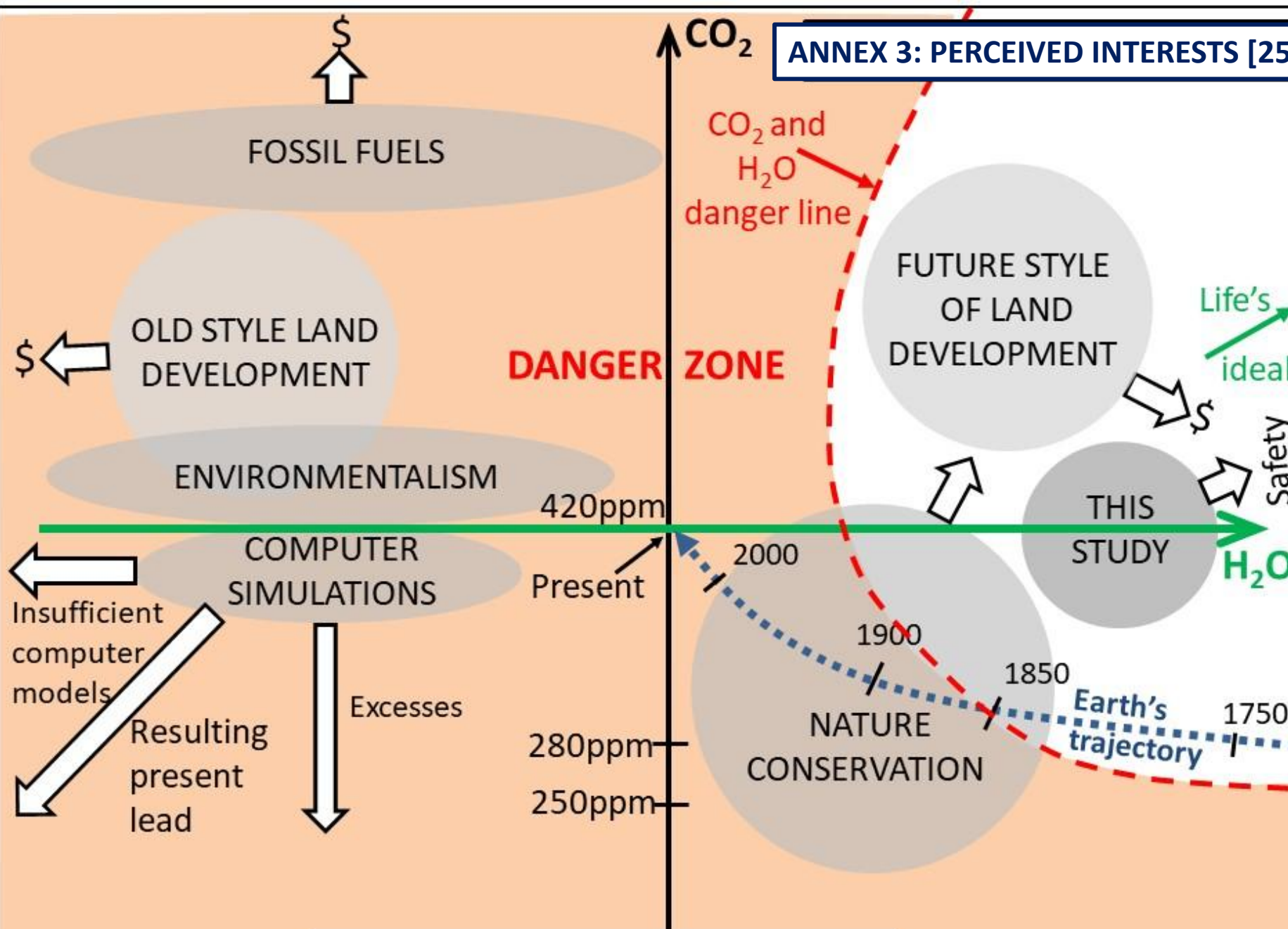
CARBON EMISSIONS THEORIES (CET)

- **The Greenhouse Effect** (Fourier J., Arrhenius S.) [73] postulated and respectively quantified CO₂, CH₄, N₂O's role in warming the atmosphere.
- **The Keeling Curve** (Keeling C. D.) [74] Empirical Evidence of Rising CO₂ through continuous measurements at Mauna Loa Observatory.
- **Human's Influence on Climate** (IPCC) [1] Climate models confirm that post-industrial CO₂ emissions are the main driver of global warming.
- **The Carbon Budget - Quantifying Safe Emission Limits** (Allen M.) [75] Maximum 500 gigatons emissions for 2020 to limit warming to 1.5°C.
- **Feedback Mechanisms** (Hansen J.) [76] Rising temperatures trigger feedback loops, amplifying or dampening effects, accelerating warming.
- **Ocean Acidification as CO₂'s Secondary Effect** (Caldeira K., Mann M. E.) [77] Excess CO₂ dissolves in oceans, lowering pH and harming life.
- **Prehistoric CO₂ emissions through deforestation** (Ruddiman W. F.) [26] The Anthropogenic Greenhouse Era Began Thousands of Years Ago.

OTHER CLIMATE CHANGE THEORIES

- **Orbital (Milankovitch) Cycles** (Milankovitch M.) [79]: Ice ages are driven by changes in Earth's orbit (eccentricity, axial tilt, precession)
- **Water Vapor Dominance Theory** (Dyson F., Christy J.) [81]: Water vapor is a more potent gas than CO₂, and its feedbacks control climate.
- **Urban Heat Island Effect Theory** (Watts, A.) [82]: Temperature records are biased by urbanization, exaggerating global warming trends.

ANNEX 3: PERCEIVED INTERESTS [25]



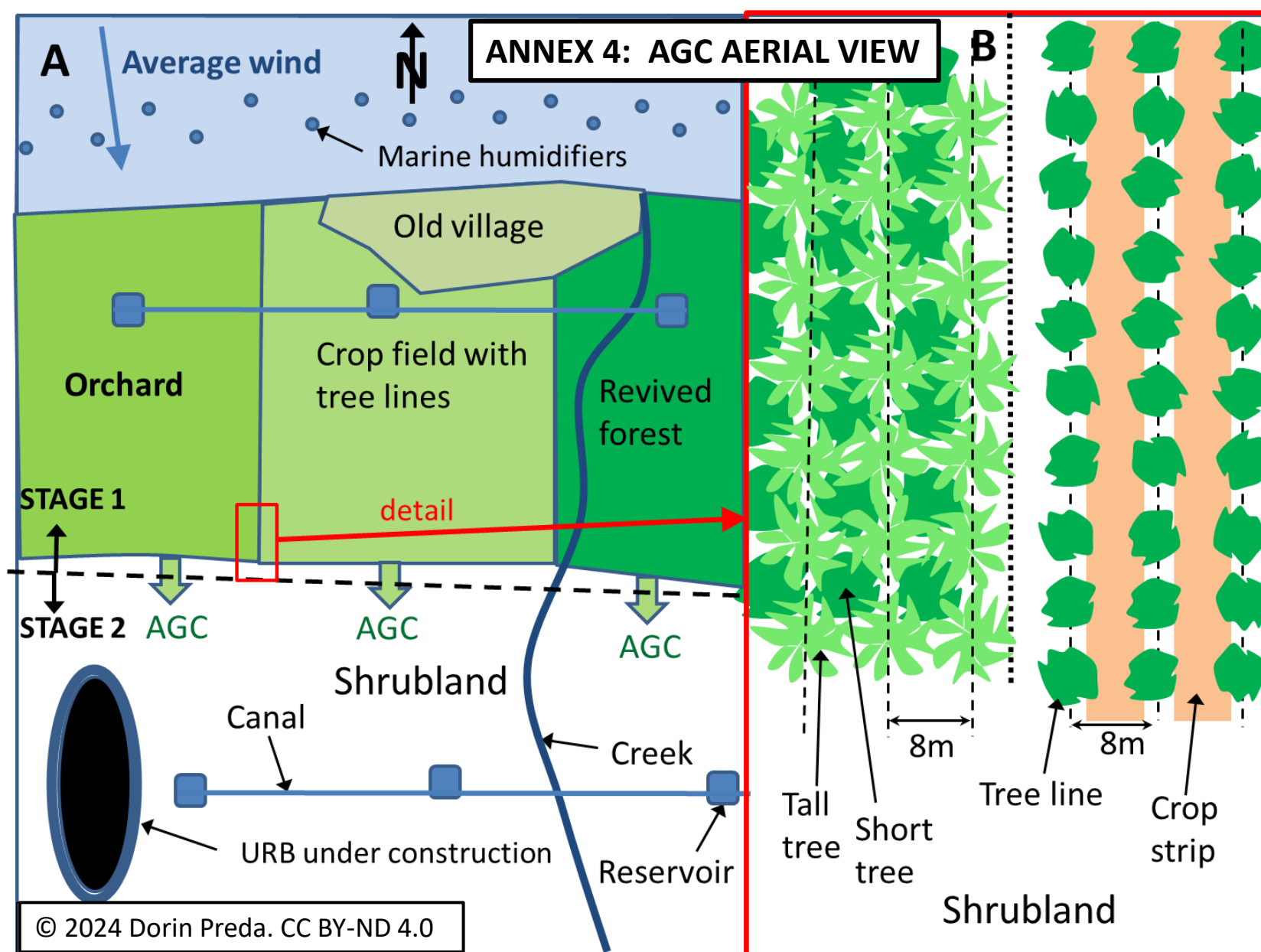
The dotted blue line shows Earth's trajectory in time through its own framework of conditions. Around the beginning of the industrial revolution the Earth probably crossed the danger line into the destructive reddish area. The reasons were too little water on land for life and climate due to mechanized deforestation, and the increased carbon gasses emissions from deforestation and the growing fossil fuel use.

Human society is mainly driven by economic interests, thus any attempt to large scale action must appease those interests.

The key to restoring the climate is to make land development and agriculture businesses aware that they would have greater benefits through planting useful trees.

The global climate is the result of all regional climates, thus we can act regionally to restore all Earth's land.

ANNEX 4: AGC AERIAL VIEW



Success keys: large AGC started from the shoreline and propagating downwind inland, large tree density, reconstituted soil, etc. [24] The source of energy is solar radiation, 25MJ/m^2 daily at medium-low latitudes. Under 65% reflecting clouds and if under trees remains 1MJ/m^2 , means that the maximum average to compensate for after reflection of 10MJ/m^2 is 14MJ/m^2 . This can evaporate around 1,300mm of water per year and is the evapotranspiration of a mature orchard that compensates for the increase in solar radiation of past deforestation. **Once AGC is started artificially with reservoir water, it re-starts the natural biotic moisture pump and rain for its inland propagation.**

It results that dense, mature orchards are needed to cool the climate where past deforestations removed the forests. At low latitudes, the orchards should preferably also have ground plants or tree canopies on 2 levels.

The Avalanche Greening and Cooling (AGC) is the land restoration that could self-propagate. It involves a network of water reservoirs and canals that store and distribute freshwater for the dense orchards, useful tree syntropic [95] plantations and restored conservation forests of high evaporation.

As seen on page 6 above, total deforestation for pastures and crop fields leads to rapid soil decay, erosion and desertification (page 14). Some people wanted to live in forest clearances (page 18), leading to intense forest and house fires as those in Europe, Australia and now on the American continent.

The January 2025 Los Angeles fires had the following causes:

1. Like the prehistoric burning for North Africa's antelopes [24], the cultural burning for Bisons [30] has turned the Nevada forest and its lake landscape into a desert [31]. Similarly, the pine forests of Sierra Nevada and Cascade Ranges were cleared out [32] for human interests [33], those areas becoming solar air heaters for the hot ASH winds. The Santa Ana wind heats up by 13°C when descending 2000m, and overheats due to above quoted **deforestation which also caused air to be very dry**. Therefore, the main cause of the damaging winds is the Central and West USA deforestation. The heating power of deforestation may be half of solar radiation, therefore $3500\text{MJ}/\text{m}^2$ per year. All energy used by world humans is $6 \times 10^{14}\text{MJ}/\text{year}$, and can be produced through deforestation of $200,000\text{km}^2$ (2/3 of Nevada state). **This huge power is the reason for which we can cool the ground only by evaporating water to send directly that vast amount of heat to upper atmosphere and space.**
2. Pacific coast deforestation has produced HACs which stopped ocean humidity reaching the inlands, slowly drying their vegetation.
3. Traditional use of flammable materials for buildings.
4. Wells and extraction of groundwater dried out the nearby trees by removing water from their roots.
5. Improper prevention measures and protection against sources of ignition and against the fires themselves once started.

Method of prevention/protection of houses against fires:

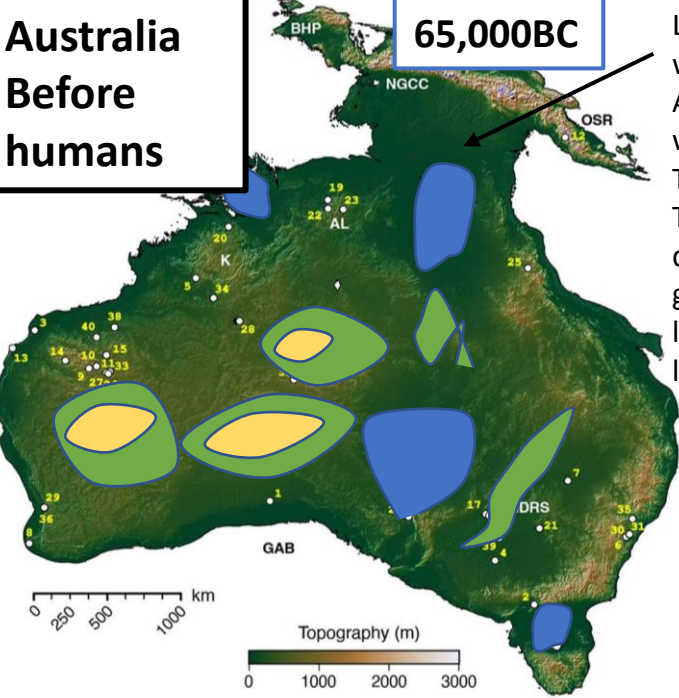
- Use only non-flammable building materials.
- Each house should have an always full 5 ton water tank and sprinklers actuated by 12V pumps and batteries, independent from the grid.

NATURAL VERSUS MAN-CHANGED FORESTS

Wet natural forests cannot burn; their ground has a thick cover of moist decaying vegetation that creates soil and is pierced by many young tree shoots, small plants and bush which stop solar radiation and wind from drying up the ground. This mulch, well-known from gardening practice, is what keeps the soil and the natural forest moist, cool and trees alive. **Moist forests attract clouds and precipitation, in a lively feedback.**

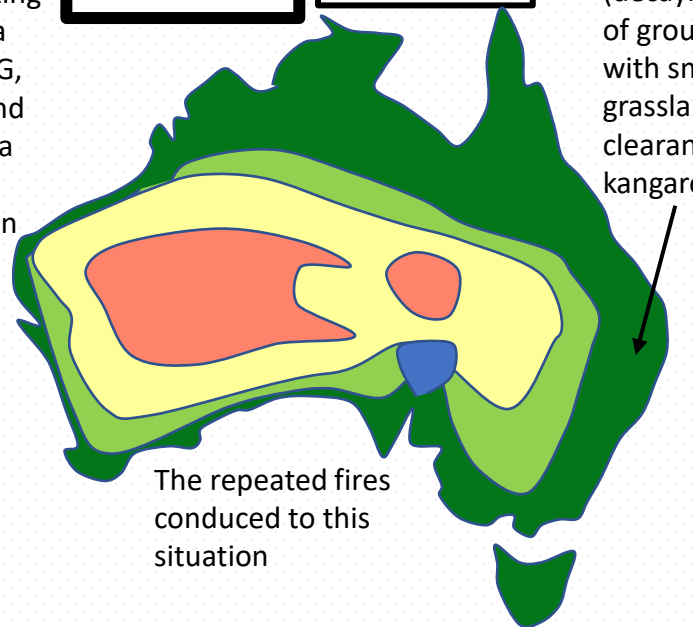
Thinning the forest or/and cleaning the ground from the litter allows sunshine and wind to dry out the trees. Clearing the forest floor and repeatedly burning it with controlled burns allows solar radiation to dry up the soil that is gradually eroded, leaving the large trees with no support. This human action transformed wet, dense forests into bare lands that have no other function but to create global warming. **Dry lands repel clouds and precipitation, in a deadly feedback.**

Australia Before humans

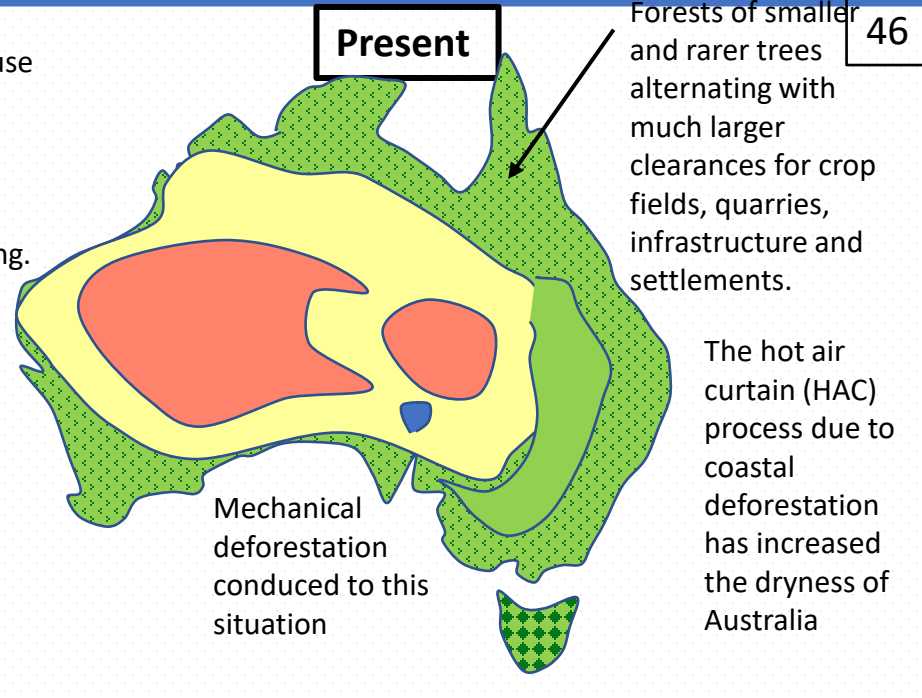


ANNEX 6

Year 1700



Present

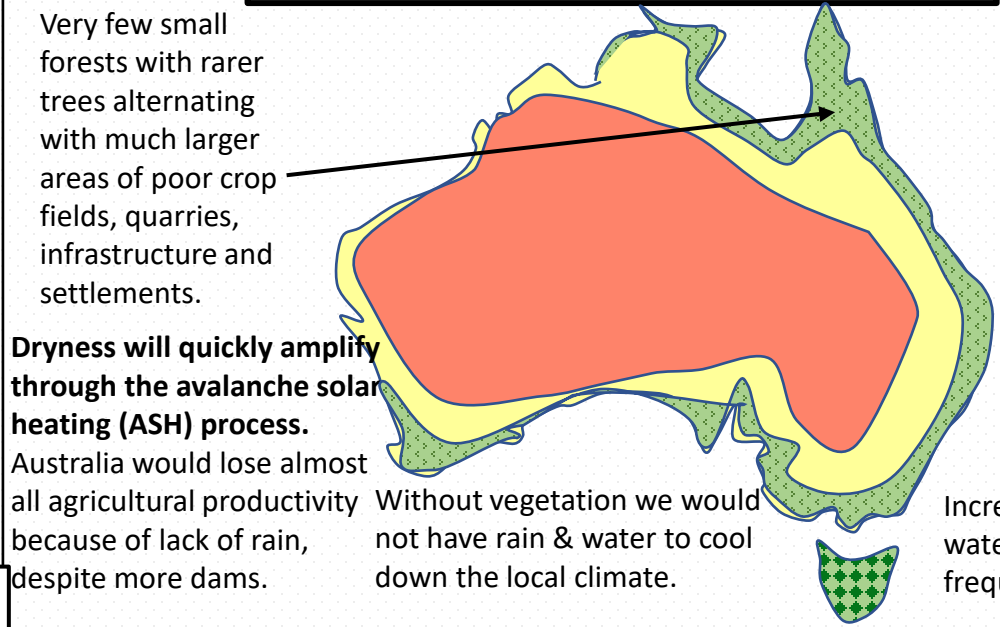


Credit: Nature Communications

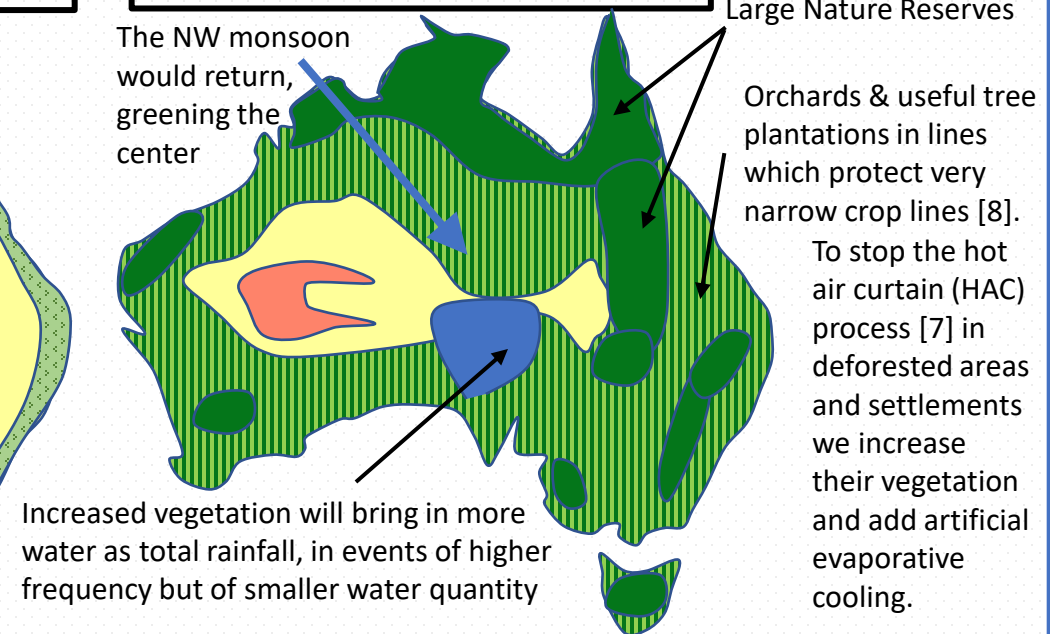
LEGEND

- Lakes
- Forest/Orchard/ Tree plantation
- Grassland/cropping
- Dryland
- Desert

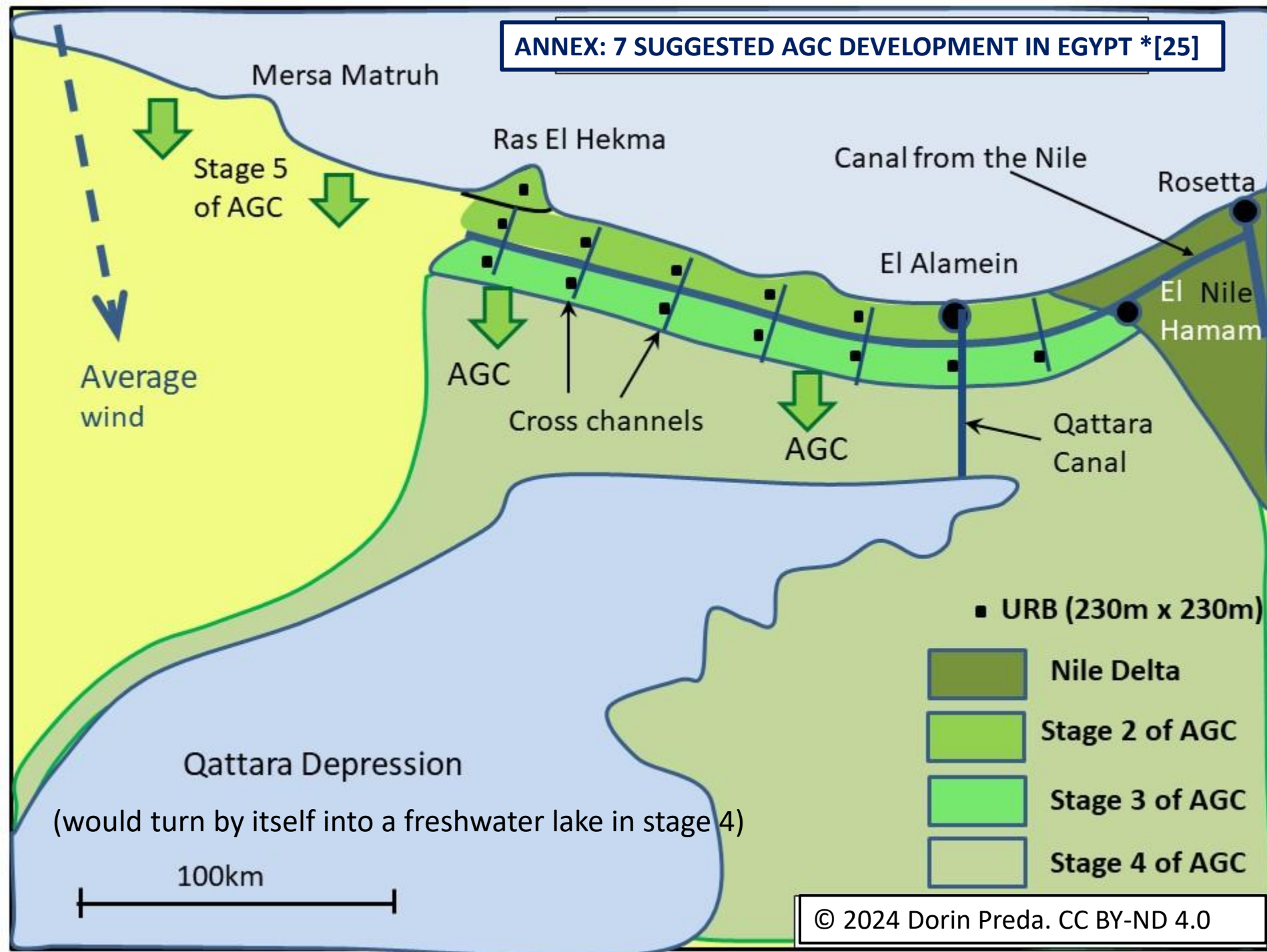
Year 2300 if we do not change our ways



Year 2300 as suggested in [93]



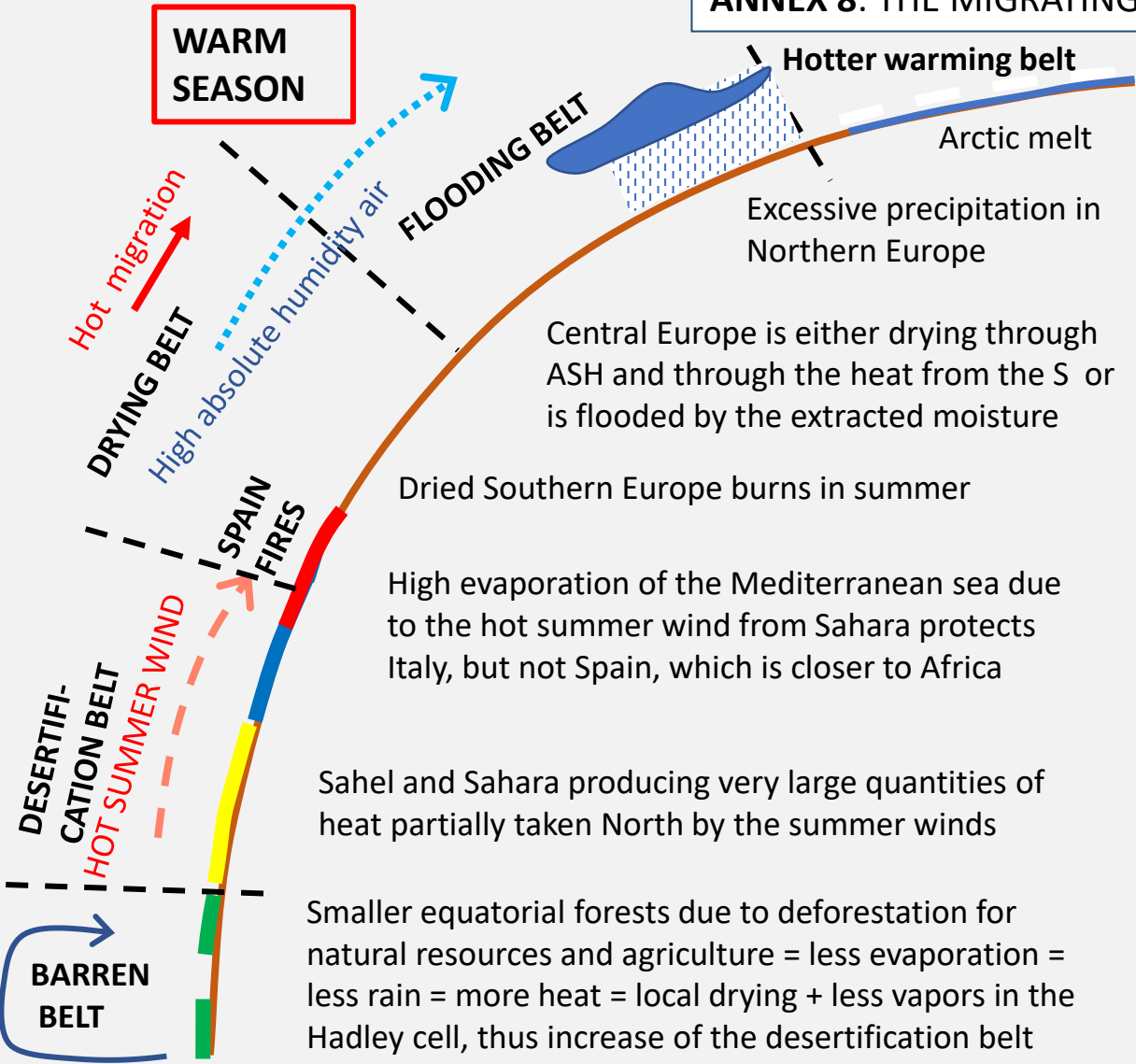
ANNEX: 7 SUGGESTED AGC DEVELOPMENT IN EGYPT *[25]



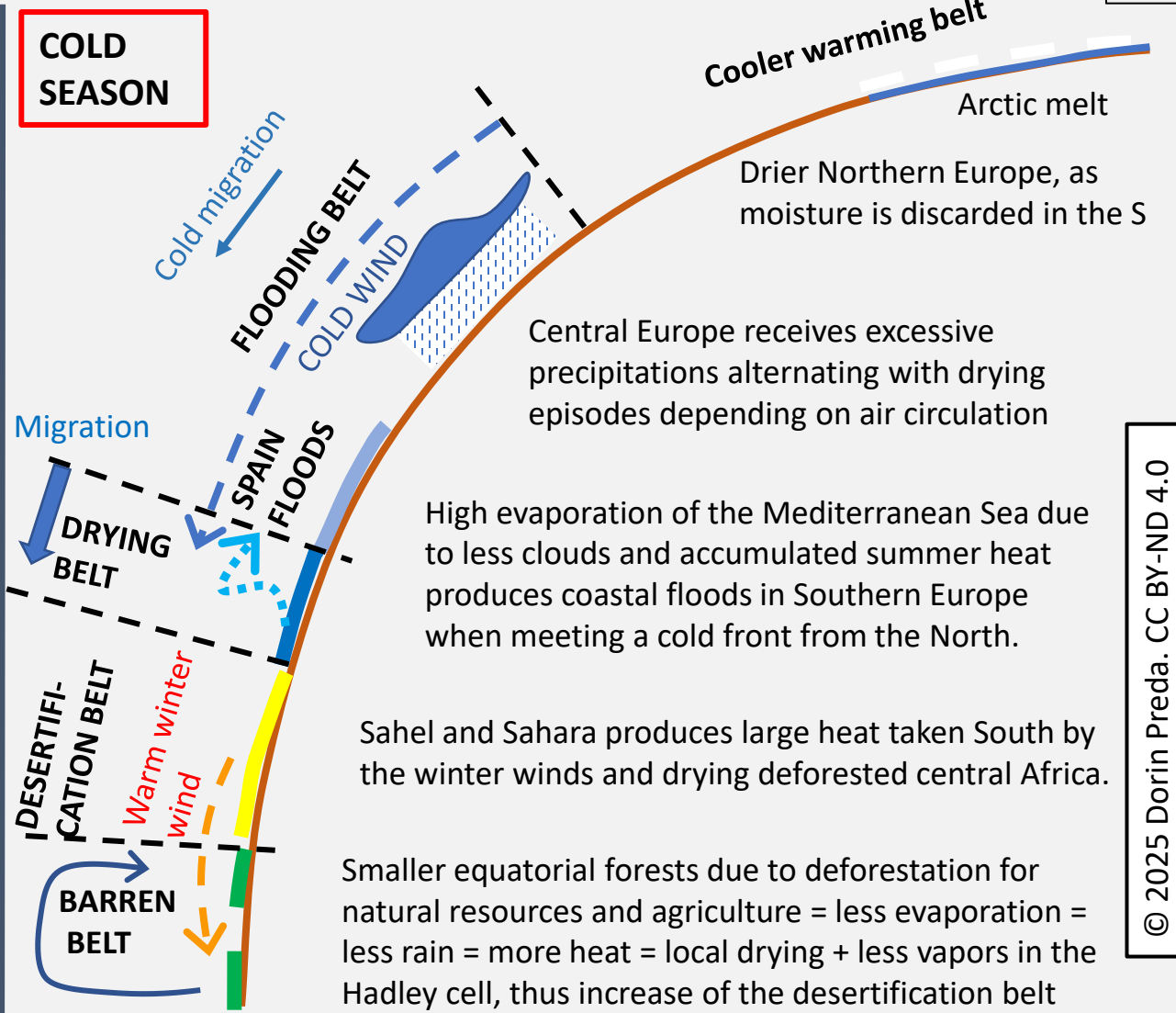
The Nile area was always wetter than the rest of North Africa due mostly to the Blue Nile River and its periodic floods related to the monsoonal rains on the high plateaus of Ethiopia. Humans did contribute to the setup of dryness in North Africa, but recently it was decided to build a N-S canal to extend agriculture.

This is a proposal for a more beneficial E-W canal. The present desert west of the Nile could be improved by bringing water from the Nile through an along-shore canal, and use it in an AGC. It is essential to start the land rehabilitation from the shore of the Mediterranean and advance south together with the improved precipitation conditions. The AGC is made possible by the dominant N-S winds of Northern Africa .

The AGC would expand in larger and larger stages, proportional to the local climate restoration.



The increasing ASH of the deforested intertropical areas create a drying belt and hot winds that advance poleward with increased strength gained in Sahara. They dry out and produce fires in Southern Europe and carry that moisture poleward, creating a flooding belt.



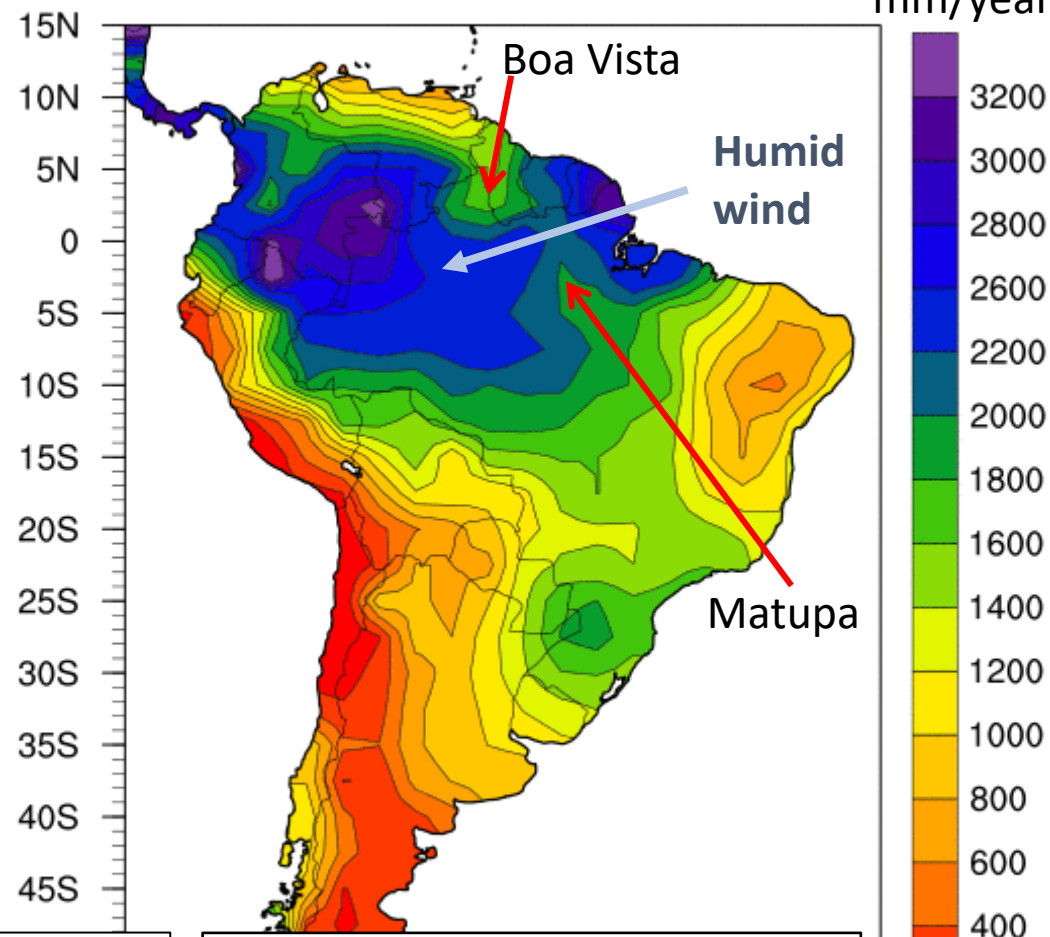
Seasonal migration of the Hadley cells moves the limits between the belts towards south in winter and towards north in summer. Jet stream dynamics create unpredictability, hence the Spain floods of 2024 and the fires of 2025, which in turn favor floods through their moisture and ash.

Deforestation



Deforestation decreases precipitation and stops oceanic humidity from reaching Amazonia. All those oceanic vapors have to condense in other regions, flooding them.

Precipitation



Deforestation also happens in Central Africa, Asia and other intertropical areas, thus the problem is global.

The southern part was almost totally deforested since the European colonization to make room for cattle ranches and mainly soybean crops, but the northern part remained intact and green until 100 years ago.

Unfortunately, deforestation of Amazonia is now accelerating for development purposes because many studies state that deforestation would cool climate through albedo [26] and would also increase precipitation [28].

In reality, deforestation might favor some local rain, but produces intense and permanent regional drought.

When the two lines of deforestation (Boa Vista and Matupa) will meet, they will create a hot air curtain (**HAC**) that will stop the incoming humid Atlantic wind reaching the interior of the continent and will dry it out. The Amazon has already started to dry out, while the oceanic moisture that was due to it has started flooding other places like the Southern USA.

Therefore, it is urgent to stop deforestation and start planting large areas of useful trees at low latitudes.

Mr Dorin Preda

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Meteorology-Hydrology
- managing director of a solar thermal company
- retired in 2024

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- A few patents of invention on heat transfer systems and solar thermal devices
- A 2020 – 2024 study and books on climate change <https://dpreda.net/earth/> supporting this presentation.

Passionate for:

- Deciphering Physics (the interface between real phenomena and human understanding)
- Creating balanced solutions for environment protection and rational economic development.
- Intellectual independence: not associated with any group of interests.

Believes that:

- The first requirement for a scientist is the high moral standing
- Open, correct scientific debate and dissemination of information should be allowed and supported for everyone's benefit. Thus, the author has made in 2020 the first edition of his book freely available on the internet, but was ignored.

In order to strengthen the Consolidated Climate Change Theory (CCCT) and clarify its scope, this annex anticipates potential criticisms from conventional carbon-emissions-focused climatology and provides corresponding responses.

1. **“CCCT underestimates the role of carbon and focuses excessively on deforestation.”** Response: CCCT does not deny or diminish the role of greenhouse gases. Instead, it demonstrates that regional land–surface changes (e.g., evapotranspiration loss from deforestation) can exceed the regional effects of carbon emissions in many cases. The CCCT framework integrates both the CET global perspective with the CCCT regional mechanisms and solutions.
2. **“The calculations on page 26 are too simplified and not regionally calibrated.”** Response: The calculations are conceptual checks, showing orders of magnitude rather than precise forecasts. They are intended to highlight the scale of evapotranspiration’s regional climatic effect compared to CO₂ forcing. As with early greenhouse-effect models, simplified physics are a foundation for more refined local and regional studies.
3. **“The comparison of 40 W/m² (forest cooling) to 2.17 W/m² (CO₂ forcing) is misleading, as one is regional and the other global.”** Response: The comparison is done at ground level, where both are valid. Climate is experienced regionally, and the aggregation of many such regional imbalances leads to global effects. Averaging processes globally obscures regional significance. CCCT restores the proper scale of analysis for climate management, which must begin regionally.
4. **“Terminology such as ‘feedforward’, ‘avalanche’, and ‘divided heat emission’ is unconventional.”** Response: New terminology is introduced only where existing vocabulary is insufficient to describe observed processes. These terms are meant to clarify rather than replace CET or LUT language. They provide conceptual tools to explain mechanisms that mainstream models currently simplify or ignore.
5. **“There is a scale mismatch between global and regional.** Response: *As mentioned on Page 7, we propose the use of AI to bridge the gap between 100km GCM grid cells and 1km land-surface processes, allowing for the integration of feedforward process like AGC. The work of Bonan [66] shows that it is possible.*
6. **“CCCT lacks validation through global climate models or peer-reviewed consensus.”** Response: Current global models cannot yet adequately represent water and land processes. CCCT therefore emphasizes conceptual and empirical approaches to fill this gap. The framework is not a rejection of CET but an extension of it, intended to improve model accuracy once regional land–surface mechanisms are integrated.