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A Leap Backwards: How Can "Green" Timber Buildings be Defined in Relation to Deforestation?

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Reasons for not Using Ash Trees for Green Buildings and Other Purposes

To anticipate the answer: I found out is not a 'how', it is a "no -more", if - still living trees have to be sacrificed. In future, every not yet dying or dangerous tree that needs to go to construct or retrofit buildings might be questionable. Those few trees in a moderate climate, by their numbers, might still be considered a small matter, especially if compared with daily appearing 2000 soccer pitches of deforestation like in the Amazonas or in the Borneo Forest [1]. There is no whistle blower who calls people to reason like armchair research does in the First World, when it comes to save our own trees. Even though we are in dire need to publish papers and call on actions how to avoid climate change, it is worthwhile to be led to the beauties of forests in modest colder climate zones. Not too long ago in the past, people used to stay in more or less cosy house temperatures when the walls were made from renewable material like the BIG five: stones, mud, clay (rammed earth) [2], homes within caves and, of course, timber!

However, why is timber the only natural renewable material among the BIG five this article suggests not to be used anymore for buildings, and many other areas– if existing resources have to be chopped?

a) The first reason might be: trees are all living creatures made by mother nature, even though in many places like monocultural agriculture humans have planted them creating issues for the habitat of animals and the climatic response. Far beyond sentimentalism, how much adoring, pleasure and relaxation is missing, if joyful trees need to perish.

b) Shading in summer, or hot climatic areas the whole year long creates higher comfort as Muhamad Haggag (2014) has proven for a neighboring shaded vs. a non-shaded terrace house in Dubai [3]. Better thermal comfort by passive cooling also means less carbon footprint which is anyway more costly than heating, if active cooling methods are required [4].

c) This leads to the main reason to put wooden constructions of the future aside: Back in 2021 IPCC found that in order to fulfil the maximum +1.5 degree C until 2050 there is no time to lose anymore [5]. "Cool changes" to preserve our liveable Earth need to be done and well established between 2021 and 2030 to turn the key in order to avoid the worst. If CO_2 savings -caused mainly by transportation, industry and the built environment-, mankind could not perform 2030, the chances of the targeted "just" 1.5°C higher temperature in 2050 will be dwindling. There is no need to rephrase the expected catastrophic consequences for the climate all over the globe.

Wood and, if the referring tree is chopped, 'was-wood' (Joe Lstiburek) cannot join the bandwagon of other natural material which still to be proposed as building material, and any material of the future. Why? Like no other building material, on average one grown up tree is capable to support the oxygen for four people [6]. However, it will take the baby tree several years or even decades to grow up to a sufficient height in order to act as O2-generator. With another

7 more years to go to find ways to combat climate change by 2030, time is soon running out. The advice learnt is not to harvest/kill, but instead, declare all of our forests and trees above a certain diameter worldwide as sanctuary. Plenty of wood workers handling sawing machines day by day, could convert into planters and gardeners by helping to replant worldwide what had been lost. Trees everywhere on the planet should not be chopped or burnt any longer unless they provoke danger for humans – like seriously affected ill trees with a tendency of being unstable, or huge coconut trees where falling coconuts are out of control by killing people. Plus a few artificially planted trees might be exceptional like some fast growing tropical trees in Indonesia and Malaysia (every 5-7 years) which can be used in a synergetic combination with concrete for well insulated roofs, floors and exterior & interior walls [7].

In the old view, and through the still uncontrollable practice of logging, harvesting timber was long since recognized as not damaging the forest. It would be fair to say that timber houses from "was-wood" can still be utilised for buildings, because they already had been felled prior to the climate goals revisited by IPCC in 2022. For the future, fast renewable alternatives not contributing to disastrous global warming, is using e.g., rice or palm oil husks in tropical countries. Fast growing hemp in colder countries is becoming more popular for the same purpose. All these solutions for green buildings do not propose to chop trees, but just use the out-crops of the plant or the tree, instead of burning them once and for all and producing additional CO_2 [8]. How can Mother Earth survive without logging and how can we help to avoid human deforestation? Wild fires and dryness causing whole forests to disappear are hardly controllable. For the latter, the development of irrigation including utilizations of the groundwater supply should be targeted and focused on.

Sustainable Example from Countries in Moderate Climate Zones: Harvesting i.e., Killing or Allowing Infiltrated Ash Trees to Generate O_2 as Long as Possible?

What is so special for our topic to make us exemplify the common ash tree? First of all, during the past 20 years, ash trees are examples by millions of trees that have been prematurely killed by humans, way before they have to die the natural way. The main reason why so many ash trees are doomed to die is

a) A fungal disease known as ash dieback disease AND

b) The emerald ash borer, a pest native to Asian animals that reportedly has already killed 200 million ash trees in the U.S. [9].

As a remedy, in a developed country with similar climatic conditions like in the North East, affected trees in Central and North Europe are indistinctively chopped. Different than in North America, the main culprit is believed not the emerald ash borer, but the fungal disease (in German: «Falsche Weiße Stengelbecherchen» - Hymenoscyphus fraxineus or Chalara fraxinea) [10]. Since 2002, originating from Japan, to a large extent this fungus silently has infiltrated every part in Central and North Europe. To cut down the affected trees, seems to be the only rescue for conventional thinking and practice. As a consequence, the innocent visitor of forests is recently presented a picture of almost systematic devastation of the ash tree population. And the 2023 winter season seems to be worse than any year before. If the trees finally die after a longer period of illness, on both sides of the Atlantic Ocean, we speak of the so-called «ash dieback». Finally, according to a 2016 report published in the Journal of Ecology, a combination of *H. fraxineus* and emerald ash borer attacks could wipe out European ash trees [11].

But the question arises, why are infested trees, which are also living beings in synergy with other trees and plants, systematically murdered? Probably millions (!) of 30-80 year old trees in Europe have their lives in one fell swoop, although their trunk structure remains as solid as a completely healthy tree. According to their leaves, which grow differently, they continue to function as O_2 suppliers for a long time. And why should all the trees in the partially inaccessible thicket pose a danger to people? According to forest sources (see below), the further spread of the fungus since 2002 cannot be stopped by cutting them anyway. In addition, a small percentage of ash trees have already mutated and become resistant. This is how nature helps itself by Darwinism and doesn't need us humans. The sick ash trees can help nature and people in the long run, as we address below. In consideration of all our known facts, forestry departments are asked to immediately leave all diseased, but otherwise intact trees live the organic rest of their days, because according to forestry experts «one thing is certain: the fungus cannot be contained and the use of fungicides and pesticides does not make sense. Other measures such as removing affected branches or trunks do not prevent the ash dieback by the fungus from spreading further. Rather, some researchers advise that the affected trees should remain standing to leave as long as they live. This could contribute to the offspring of these trees developing resistance more quickly... Felling is advisable as soon as two thirds of the crown are dead. Because the tree will not survive much longer under these circumstances» [12].

In none of the hundreds of recently killed ash trees we have we seen this condition, so to speak, on the deathbed. And for the existence of leaves as the green lungs for generating O_2 as proof or counter-evidence, it still needs to wait for spring. In general, the condition of diseased trees is characterized by forestry experts as follows: «In the advanced stage of the disease, the weakened plant can be additionally infested by secondary bark fungi and wood rot pathogens and the host plant can die off» [13,14]. Only a very partial discoloration of the inside of the trunk indicate the pending or actuated felling of the ash trees. Nevertheless, this does not change anything about the robustness of this later timber, even for the experts. Hereby we are facing economic interests to kill the trees for different purposes including to build houses.

Picture 1: Fungal disease affecting the ash trees of Europe. The picture shows how wood within a branch turns to a brownish-grey colour, which often extends longitudinally down the stem or branch [14].

Picture 2: Ash dieback disease (*Hymenoscyphus fraxineus*) indicated by empty ash tree crowns and replacement twigs in Kocherwald (Bad Friedrichshall, Germany).

Conclusion

A. If the fungus was able to spread undetected from Japan to the entire Northern European Union located North of the Alps as early as 2002, then it is certainly already there in all forests. Against the background of its multiplication, which is given anyway, it admittedly makes no sense to kill infested trees - the small fungus is unrottable, travels by wind and transmits the disease to others in the same tree population anyway. Trees in the early stages of the disease are still providing oxygen and, each one of them, are contributing to the urgent decarbonization of our planet. To allow one analogy: people are not immediately sentenced to death if they have seemingly irreparable cancer. This is how those soon to be dying ash trees usually look like: (Pictures 1 & 2).

B. In Europe, some of the ash trees do not carry the disease, they remain healthy for reasons that are not yet known. However, some of the seriously ill ash trees were obviously cut off in the early stages of the disease in an "omnibus felling process" - although we did not succeed in locating a single seriously ill ash tree on various inspections. Slightly sick but very stable, or completely healthy appearing logs were detected in 50 over cases ready to be bundled and transported to the final user: (Picture 3). The typical colours of a tree doomed to die soon could rarely be traced in the pictures our team took. Even by changing colours, the trees were and are not getting brittle. They appear as fully usable for economic purposes - like building wooden houses.

Picture 3: Central European Ash trees affected and killed by either vast actionism of the forester or economic considerations (February 2023).

C. Felling only at a late stage - foresters or forest workers can see the decay of an affected tree with their naked eye – which is certainly logical. Any prior action to fell the Ash tree would be something like a medical doctor killing a patient once he has a flu or is infected with HIV. This doctor would not stay in his job until such first casualty is detected. Of course, trees are not humans, but together with birds and other animals that need the trees they are living creatures that should be treated as such. Not a harsh, senseless intervention at the first or mediocre symptoms by sighting the fungus on the bark or on treetops sprouting replacement shoots should be a sign to call upon the saw to cut off the tree.

D. Transmission of the disease to other tree species does not appear to take place, contrary to the statement of a passer-by who referred to the forestry office in charge. But are the felled trees all «just» ash trees? Some passers-by also found some felled beeches among the fallen tree bundles... or paradoxically two felled and one unfelled tree from the same shoot.

If we now wanted to argue again from the perspective of the UNO: only together in line with the treasures of our nature – animals, plants and trees, we can achieve the climate goals for 2050 in the critical preparatory years between 2021 and 2030. Ecological needs clearly have to be prioritised compared to economic considerations. A ban on all senseless deforestation today in the moderate climate zones of the EU and the US should be proposed and implemented. Maybe mankind won't save our fragile planet, but an initiative like "stop killing any trees" will give impulses, how slowly but surely we can help to walk some of the first transnational steps of the way to a better future in the «forest» ecosystem.

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