
China and Malaysia: furthering plantations and GE Trees

Much of the research into genetic engineering (GE) of trees focuses on following plantation industries' wishes, which are most interested in: trees that would grow faster, contain more cellulose, less lignin, are resistant to herbicides, insects and fungi, are resistant to droughts and low temperatures and do not flower. Trees are also being pursued for their capacity to store carbon as a supposed solution to climate change. Industries and business conglomerates are eager to expand their profits (1). The governments of China and Malaysia are promoting further expansion of monoculture plantations while advancing research on GE trees. This poses serious threats to the remaining forests, water sources and local territories whilst intensifying conflicts with the populations who live with and depend upon forests.

China: GE trees crossing the wall

China is the only country in the world to have approved and released commercial plantations of GE trees and the country with the second highest number of field experiments worldwide, after the US. During the last decade, over one million insect resistant GE poplars have been planted in China. Genes from the GE poplars have already appeared in natural varieties growing nearby, and new insect pests have emerged that were previously unknown in non-genetically engineered poplar trees (2). In 2008, GE poplars engineered to tolerate saline soils were planted (3).

Meanwhile, China also has the world's largest tree-planting project, with 66 billion trees planted since 1978. The "Three North Shelterbelt Project" or as it is commonly called the "Great Green Wall" is intended to stretch 4,500 kilometres along the edges of China's northern deserts by 2050, covering 405 million hectares (42% of its territory), in an attempt to counter the effects of its past mass deforestation (4). Most of the planted area is and will continue to be monoculture tree plantations, including plantations of GE trees (5).

The disturbing impacts of such large project are starting to show. In arid areas, tree plantations can aggravate desertification by depleting groundwater and killing grasses that hold the soil. Zhao Wenju, a farmer from the Zhangjia village, which is close to Beijing, says that a well that hit water at 9 meters below ground a decade ago now needs to extend to 60 meters below ground to draw water. Hou Yuanzhao of the Chinese Academy of Forestry worries that dying poplars in this area, which is less dry than many others covered by the project, are the start of a widespread withering of the planted trees (6).

No one knows the exact area planted with GE trees in China. No records are known to be kept on where the GE trees are planted or how many have been planted. "It is very difficult to trace them," commented Wang Lida, from the Chinese Academy of Forestry. Poplar trees can be very easily propagated and GE trees are moved from one nursery to another. But besides poplar, research is also being undertaken to develop GE eucalyptus and rubber trees.

Malaysia: GE rubber trees as "living factories"

Malaysia is the world's sixth largest producer of natural rubber. The US, Germany and Japan are the largest markets for Malaysian rubber products, with the UK, China and Australia also being important buyers. Manufacturers comprise multinationals and joint ventures from various countries including the US, Europe and Japan, as well as locally-owned enterprises (7). While Malaysian states have jurisdiction and controls over land and forests, forest communities and indigenous peoples have their territories largely unrecognized (8).

The Malaysian Rubber Board is the custodian of the rubber industry in Malaysia and has the Rubber Research Institute of Malaysia (RRIM) under its administration, which is in charge of the research work on natural rubber. In 2014, the RRIM submitted an application seeking approval for conducting “confined” field trials of GE rubber trees in Penawar, Kota Tinggi in the state of Johor, to produce specific proteins in the latex for pharmaceutical use. According to the rubber industry, the potential of rubber trees is not only for producing rubber products and rubberwood, but also for sequestering carbon from the atmosphere. And for this, “transgenic rubber plants could serve as efficient, low cost, low maintenance and environment-friendly production lines for the production of the targeted protein” (9)

A press release from the Consumers’ Association of Penang and Sahabat Alam (Friends of the Earth, Malaysia), of February 2015, however, voiced strong opposition to the growing of GE trees in Malaysia (10). “What assurances are there that the transgenes will not spread in the environment?”, enquire the concerned groups. And continue, “given their perennial growth and, in many cases, long lifespan and large size, GM trees may develop complex and multi-level ecological interactions with other organisms. The interaction of these trees with the environment can thus result in long-term impacts on soil, food webs and forest ecosystems, which need to be evaluated”.

Malaysia is a party to the Convention on Biological Diversity, which has called for a precautionary approach to GE trees. This means not growing or field-testing such trees before ascertaining the real potential long-term impacts of GE trees on forests and the livelihoods of indigenous and local communities. Yet, the press release emphasizes that “it is not even clear if such field trials have already been conducted in Malaysia without public knowledge and in contravention of the law”. The RRIM application does not even address the possible negative environmental impacts, and therefore, they conclude that “in view of the scientific gaps and lack of certainty there cannot be any planting of GM rubber trees in Malaysia, whether for field trials or commercial reasons”.

Meanwhile, the government of Malaysia is advancing the expansion of tree plantations with a legal framework that classifies single-species monocultures as forests. Much of the remaining forests in Peninsular Malaysia are classified as “Permanent Reserved Forests” (PRFs), which are available for “selective” logging. However, a loophole in the law is allowing the conversion of these areas into monoculture rubber plantations. Rubber tree plantations are thus expanding in the country. “Under the [Forestry] Act, most PRF are classified as ‘timber production forest’ under ‘sustained yield’. This can be interpreted to mean that a forest that is clear-felled and then replanted with rubber trees, will provide ‘sustained yield’, thereby justifying the conversion into plantations,” says forestry researcher Lim Teck Wyn (11).

Engineering profits: a win-win research plan?

Research groups focused on advancing GE trees generally claim that by engineering trees they will ‘improve’ them. However, what they are really doing is improving the profits of those industries benefiting the most from GE trees. That means that by changing certain genetic attributes of the trees to better serve the interests of those who are financing this research -particularly large tree plantation

companies –, it increases the profitability of the businesses involved. A GE herbicide-resistant tree, for example, is not ‘improving’ anything – rather quite the opposite. This modified tree permits extensive application of herbicides, and as a result, this will damage the soil, destroy local flora, poison fauna, pollute water and severely impact local populations’ health and livelihoods. As communities’ territories are kept largely unrecognized and forests are cleared, communities are confined to reduced areas, threatening their food sovereignty, livelihoods and cultures.

(1) See further information on GE trees here: <http://wrm.org.uy/bulletins/issue-206/>

(2) See WRM briefing “GE Tree Research: A country by country overview”, http://wrm.org.uy/wp-content/uploads/2008/11/GE_Trees_Briefing_updated_2014.pdf

(3) http://www.futuragene.com/en/press_24_02_2012/GM-TREE-PLANTATION-RESEARCH-FACT-SHEET.pdf

(4) <http://www.economist.com/news/international/21613334-vast-tree-planting-arid-regions-failing-halt-deserts-march-great-green-wall>

(5) <http://www.i-sis.org.uk/GMTGL.php>

(6) [Reference \(4\)](#)

(7) <http://www.mrepc.com/industry/industry.php>

(8) See: Forest Peoples Programme report “Deforestation Drivers and Human Rights in Malaysia: a national overview and two sub-regional cases”, <http://www.forestpeoples.org/sites/fpp/files/private/publication/2014/12/deforestation-drivers-and-human-rights-malaysia.pdf>.

(9) <http://www.lgm.gov.my/GreenMaterial/TheMalaysianNRIndustry.pdf>

(10) <http://www.consumer.org.my/index.php/development/environment/829-gm-rubber-trees-in-malaysia-jumping-off-without-a-safety-net>

(11) <http://says.com/my/news/there-is-an-unspoken-loop-hole-sacrificing-our-protected-forests-for-rubber-plantations>