

BIOPIRACY OF CLIMATE RESILIENT SEEDS ¹

Navdanya

Biodiversity creates the resiliency needed in seeds to recover from climate disasters.

The Biotechnology industry and the Gates Foundation are intent on using the climate crisis as an opportunity to push GMOs to biopirate and patent climate resilient seeds and deepen their monopoly on the world's seed supply².

Chemical agriculture and the globalized food system are responsible for 40-50% of all greenhouse gas emissions³ that contribute to climate change⁴.

Both centralized systems and chemical-based monocultures are much more vulnerable to failure and collapse in unstable and climate extremes. It stands to reason therefore that GMOs and monopolies are not the answer to mitigating or adapting to climate change, or reversing biodiversity erosion for that matter, being embedded in chemical monocultures and centralised monopolistic control over the seed supply.

How the Gates Foundation Presents the Biopiracy of Flood Tolerant Rice as "Innovation"

Problem: In areas of Asia and Africa where rice-growing farmers depend on rain fed agriculture, rice productivity is low and unstable due to stresses such as flooding, drought, and poor soils⁵.

Flooding regularly afflicts over 6 million hectares in South Asia⁶ and as much as one-third of the rain-fed lowland rice-growing areas in sub-Saharan Africa⁷.

¹ Extracted from: Shiva, V. et al. (2017). *Seeds of hope, seeds of resilience – how biodiversity and agroecology offer solutions to climate change by growing living carbon.* <https://navdanyainternational.org/publications/seeds-of-hope-seeds-of-resilience/>

² Capturing 'Climate Genes.'" *ETC Group*, October 21, 2010. <https://www.etcgroup.org/content/gene-giants-stockpile-patents-%E2%80%9Cclimate-ready%E2%80%9D-crops-bid-become-biomassters-0>

³ "Food and Climate Change: The Forgotten Link." *Grain*, September 28, 2011. <https://www.grain.org/e/4357>

⁴ Shiva, V. (2008). *Soil not oil.* Environmental Justice in an Age of Climate Crisis. South End Press. https://www.goodreads.com/work/best_book/4552955-soil-not-oil-environmental-justice-in-an-age-of-climate-crisis

⁵ Vogel, E., Donat, M. G., Alexander, L. V., Meinshausen, M., Ray, D. K., Karoly, D., Meinshausen, N., & Frieler, K. (2019). The effects of climate extremes on global agricultural yields. *Environmental Research Letters*, 14(5), 054010. <https://doi.org/10.1088/1748-9326/ab154b>

⁶ "2017 South Asian Floods." *Wikipedia*. https://en.wikipedia.org/wiki/2017_South_Asian_floods

⁷ van Oort, P. A. J., & Zwart, S. J. (2018). Impacts of climate change on rice production in Africa and causes of simulated yield changes. *Global Change Biology*, 24(3), 1029–1045. <https://doi.org/10.1111/gcb.13967>

Neither newer rice varieties nor farmers' traditional varieties are able to survive prolonged submergence under water.

There is a need for new rice varieties that can withstand a range of environmental stresses.

Innovation: Harness the knowledge of leading global, regional, and national agricultural researchers and combine it with local know-how to develop and distribute submergence-tolerant rice to small farmers.

Through Stress Tolerant Rice for Africa and Asia (STRASA), the International Rice Research Institute (IRRI) partners with researchers at the Africa Rice Centre, an African research organisation, and national scientists in poor countries, creating submergence-tolerant rice varieties that can “hold its breath” underwater.

STRASA developed improved varieties through identifying and using traits that allow rice to make better use of oxygen even while submerged, therefore coping with this stress that can devastate crops⁸.

However, Climate resilience is a complex trait and cannot be “engineered” through the crude tools of transferring single gene traits from one organism to another. What corporations and the Gates foundation are doing is taking farmers' varieties with known climate resilient traits from public gene banks, mapping their genome, and taking patents on the basis of guesswork and speculation on which part of the genome contributes to the known trait.

Like Columbus -- who, setting out for India, getting lost and arriving in the Americas, “discovered” “America” -- Gates and Monsanto are “discovering” climate resilience.

Just as the narrative of Columbus' discovery erases the indigenous people who lived across the American continent, the patenting of climate resilience erases farmers breeding, and the biodiversity which they have given us. It erases the source of the seed, the culture of the seed, the commons of the seed. It is an enclosure through piracy - Biopiracy.

Patenting life through genetic engineering is rapidly giving way to patenting life through mapping the genome.

Navdanya's Community Seed Bank in Orissa has conserved more than 800 rice varieties and multiplied and distributed salt tolerant varieties and flood tolerant varieties. The “innovation” to evolve these climate resilient traits has occurred cumulatively and collectively over thousands of years. These traits and crops are a commons.

However, the biotech industry are now presenting the traits evolved by nature and farmers over centuries as the “invention” of “scientists”, who rename the flood tolerant property in the farmer's variety, such as “Dhullaputia” from

⁸ “STRASA Legacy Site - Flood-Tolerant.” *IRRI STRASA Legacy Site*.
<https://sites.google.com/irri.org/strasalegacy/varietal-releases/submergence>

Orissa, as the Sub1A or the submergence tolerant gene. They proudly state “Using marker-assisted selection (/not transgenics) the researchers were able to isolate the submergence tolerant gene, Sub1A, and then transfer it to a rice variety that is grown on more than 5 million hectares in India and Bangladesh, known as Swarna. Most rice can tolerate flooding for only a few days, but researchers say the new variety, Swarna-Sub1, can withstand submergence for two weeks without affecting yields”⁹.

This is a scientifically flawed description based on genetic reductionism because flood tolerant traits, like other climate resilient traits such as salt tolerance and drought tolerance, are multi-genetic traits. They cannot be identified as a “Sub1A gene” because it is not simply just “a gene”, which they have referred to as “Submergence tolerance 1 (Sub1) Quantitative trait locus (QTL)”.

What marker assisted selection does, is identify the genetic sequence that is always linked to varieties which share a trait¹⁰. Such varieties are then selected for crossing conventionally with varieties like Swarna.

Farmers who have bred the traits did not need marker assisted selection to breed for climate resilience. The diversity and pluralism of knowledge systems, and diversity of languages to describe and name processes and organisms must be recognized.

Gates steals centuries of breeding by farmers and describes it as a new flood-tolerant rice which will offer relief for the world's poorest farmers¹¹. This is how the Gates Foundation redefines the Biopiracy of flood-tolerant rice from India's farmers as ‘innovation’ having the consequence that farmers as breeders disappear, meaning the source of flood tolerant traits disappears. They become recipients of that which came from them in the first place. This is the regime of Bio Nullius, building on the concept of Terra Nullius¹² – that farmers’ minds are ‘empty’, and their seeds ‘empty’ and ‘innovation’ only begins when Gates and Big Money takeover.)

Adapting to an unpredictable, changing climate requires diversity at every level. Biodiverse and decentralized systems have shown to be more resilient in times of climate change and have more flexibility to respond^{13 14}.

⁹ Saikat Kumar Basu (2011) Earth grab: geopiracy, the new biomassers and capturing climate genes, by Diana Bronson, Hope Shand, Jim Thomas and Kathy Jo Wetter, *Biodiversity*, 12:4, 274-275, DOI: 10.1080/14888386.2011.643575

¹⁰ “Smart Breeding.” *Greenpeace International*, October 28, 2014.

<https://www.greenpeace.org/international/publication/7075/smart-breeding>

¹¹ Le, Vincent. “New Flood-Tolerant Rice Offers Relief for World's Poorest Farmers.” *The Ronald Laboratory*, May 8, 2015. <https://cropgeneticsinnovation.ucdavis.edu/new-flood-tolerant-rice-offers-relief-worlds-poorest-farmers>

¹² “Terra Nullius.” *Wikipedia*, https://en.wikipedia.org/wiki/Terra_nullius

¹³ Shiva, V., & Leu, A. (2018). *Biodiversity, Agroecology, Regenerative Organic Agriculture: Sustainable Solutions for Hunger, Poverty and Climate Change*. Westville Publishing House. https://books.google.com/books/about/Biodiversity_Agroecology_Regenerative_Or.html?id=ShyhWgEACAAJ&redir_esc=y

¹⁴ Altieri, Miguel & Nicholls, Clara & Henao, Alejandro & Lana, Marcos. (2015). *Agroecology and the*

We also need biodiversity at the level of knowledge systems¹⁵.

Biodiversity of knowledge implies that we recognise the ever-evolving knowledge of women, farmers, tribals, citizens which comes from their life experience, their intimate connection with the Earth and local ecosystems as well as its biodiversity. We need to recognise the emerging sciences of agroecology and epigenetics.

At the ecosystems level, agroecology is also a systems paradigm. This is the real science of agriculture and food production, not biotechnology.

We also need biodiversity in our economic activities. We need local food systems, regional food systems, national food systems, while some trade can take place at the international level.

Finally, we need Biodiversity of political systems and decision making. Centralised and bureaucratic systems are like dinosaurs. They are not flexible and cannot adapt and evolve.

We need flexibility, which comes from diversity. Biodiversity in politics is what I call Earth Democracy.



design of climate change-resilient farming systems. *Agronomy for Sustainable Development*. 35. 10.1007/s13593-015-0285-2.

https://www.researchgate.net/publication/276291228_Agroecology_and_the_design_of_climate_change-resilient_farming_systems/link/555614ed08ae6943a8733699/download

¹⁵ The International Commission on the Future of Food and Agriculture, *Manifesto on the Future of Knowledge Systems: Knowledge Sovereignty for a Healthy Planet*, Regione Toscana, Arsia, 2008, https://navdanyainternational.org/wp-content/uploads/2016/04/conoscenze_ing.pdf