

The seed and the time

October 31, 2025 · Michele Kettmajer



There are places in which the future is not built with silicon, but with dust. Dust of seeds, collected one by one by hands that do not program algorithms but possibilities of life. In Madagascar, in the vicinity of the forest of Antavolobe, groups of botanists and local inhabitants traverse paths of mud and roots to save the raw material of biodiversity: seeds of trees that do not grow in any other place of the planet. Every collection is a collective expedition, an intertwining of traditional knowledge and modern science, where the observation of natural cycles joins to the digital maps and to the genetic analyses of the laboratories of Kew.

An evolutionary loss

Between 2001 and 2024 Madagascar lost about a quarter of its native rain forests, equal to over 4.4 million hectares. Every year about 215,000 hectares vanish, the equivalent of almost 300,000 football fields, swallowed by fires, subsistence agriculture, illegal logging and infrastructures. Today remains intact less than 10% of the original forest cover along the eastern coast, where are concentrated the oldest and most complex ecosystems of the island.



Rain forest in the Montagna d'Ambra National Park, Madagascar – licensed under the terms of the cc-by-sa-2.0

The loss is not only ecological: it is evolutionary. Madagascar separated from the supercontinent Gondwana about 90 million years ago, becoming an isolated natural laboratory. Here evolution has followed its own paths, generating over 13,000 species of plants, of which 83% endemic, that is, non-existent elsewhere. But the term “endemic” is insufficient: those species are relational, co-dependent. The trees of *Dalbergia* (the rosewood of Madagascar), for example, fruit only in the presence of determined species of pollinating bats; many orchids survive thanks to specific symbiotic fungi. Every plant, every seed, is a node inside an ecological and cultural network that science attempts today to map before it is broken completely.

A collective cognitive infrastructure



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The Millennium Seed Bank of Kew, in Sussex, is the response to this accelerated loss. Founded in 2000, it houses today over 2.5 billion seeds belonging to 40,000 species, equal to about 10% of the world's flora. The seeds are preserved at -20 °C in conditions of controlled humidity, tested for germination and accompanied by genetic sequencing and ecological data of provenance. Every specimen is duplicated in multiple deposits to avoid accidental loss: Madagascar, the only Country besides the United Kingdom with a direct headquarters of Kew, sends the samples collected by local botanists and rural communities, who participate actively in the process.

This network constitutes a collective cognitive infrastructure, a model of global cooperation in which the conservation of life is not only a technical act, but a form of shared governance. Every seed is registered, studied, distributed: a living archive that joins ancestral knowledge and biotechnology, academic research and community care.

In 2020, for example, seeds preserved in the Seed Bank allowed reintroduction in Australia of a rare species of legume (*Glycine latrobeana*) almost extinct after the fires. In 2024, the Kew Madagascar program added 18 new tree species to the collection, one of which never documented before by science.

In the meantime, a few days' walk from Antananarivo, someone collects a seed from a tree that flowers only every five years. There is no scientific document that confirms it, no botanical database that registers its cycles. And yet, that gesture exists. It is handed down. It happens. It is told in the rural areas of the Malagasy hinterland, as the foundational myths

are told: not to verify them, but to inhabit them. That seed is real not because it is measurable, but because it is shared. Because every time that someone collects it, they recognize in that movement a promise of continuity that no digital platform knows how to guard.

A social and scientific experiment

A botanist opens a magenta fig in the heart of the forest and finds seeds too humid to be preserved, “recalcitrant”, they call them. Too much water to survive the cold of the freezer. Too much life to let itself be immobilized. And so they are planted immediately, in the ground, among the roots of the lemurs and the hands of the farmers. Every germination is a social and scientific experiment together: a diffused laboratory in which knowledge is transmitted not through papers, but through gestures.

The future is not built only in the data centers, but also and above all in the nurseries. Not in the simulations of thought, but in the continuity of germination. The seed is the contrary of the code: where the code reduces, the seed expands. Where the algorithm predicts, the seed waits. It is born only when the conditions allow it, and at times, as in Madagascar, only every five years.

This is the measure of hope: not the immediacy of the response, but the duration of the wait. Not the calculation, but the trust in time and in the community that inhabits it. If the digital civilization accumulates data to control the world, the civilization of the seeds collects them to return them.

When pigs fly

When the eastern forest disappears, said an ancient eastern saying, then pigs will fly. A time it meant “never”. Today, after decades of deforestation, the proverb has become reality. But in the hands of those who still collect seeds, the sense turns upside down: perhaps, one day, it will be again unthinkable that the forest disappears.

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