arq (2023), **27.3**, 278–284.
doi: 10.1017/S1359135523000325

Haiti: architecture to save the soil

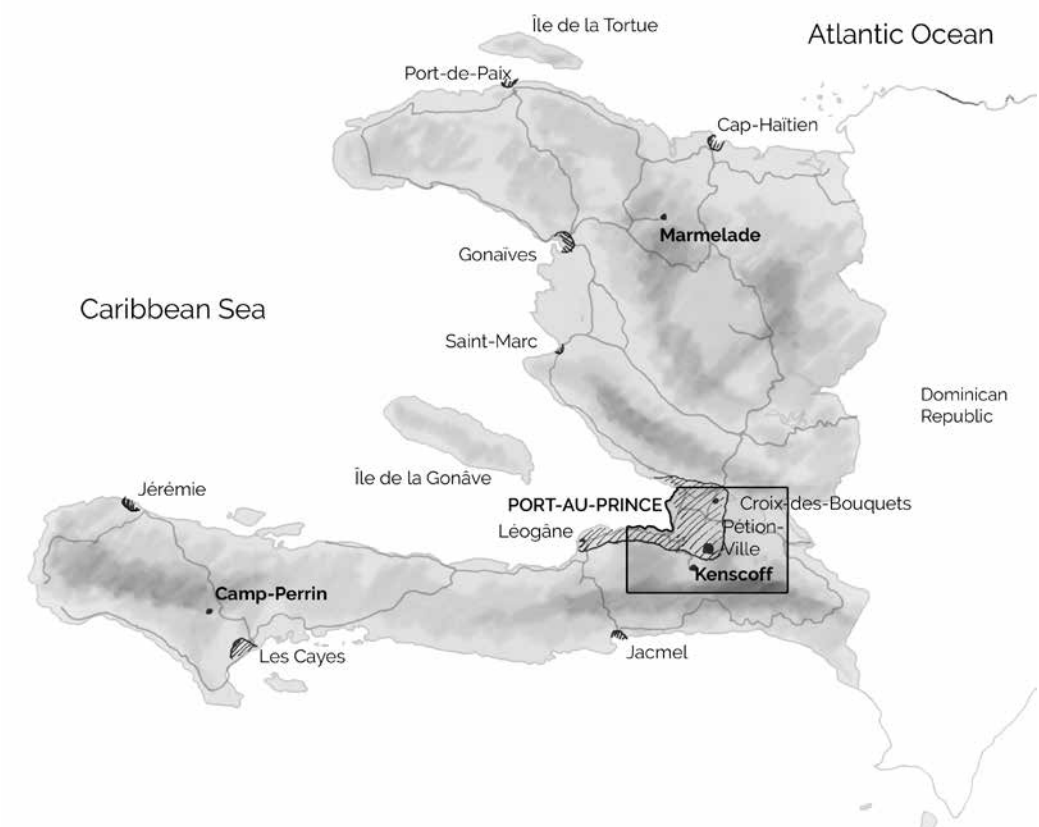
Jane Wynne is interviewed by John Naylor

Jane Wynne is interviewed by John Naylor about the Wynne Farm Ecological Reserve in Haiti, and the merits and challenges of bamboo construction there.

The use of bio-based construction materials in Haiti could help the construction sector to transition, from non-seismic unreinforced masonry structures towards materials that can reverse catastrophic deforestation, promote ecological regeneration, and help save the soil. Architecture has a role to play in this vision, by creating new designs and incentivising clients to invest in new materials.

In May 2022, a symposium took place to discuss the opportunities and challenges of bamboo construction in Haiti. This was held online – jointly coordinated by the Wynne Farm Ecological Reserve, Haiti, The University of Pittsburgh, US, and Newcastle University, UK.

Jane Wynne is the co-owner of the Wynne Farm Ecological Reserve, which has promoted bamboo in the Haitian economy and society. It was the founding partner institution of the Architectural Association School of Architecture Haiti Visiting School (AAVS Haiti) which, for five years, organised a series of architectural design and construction workshops with bamboo for local designers.1 John Naylor (JN), who directed AAVS Haiti, talks to Jane Wynne (JW) about the current economic, sociopolitical, and environmental context of Haiti, and the potential of its bamboo resources.



1 A sketched map of Haiti with notable bamboo growing locations marked in lower case bold. The callout relates to figure 4, which zooms in on the area of Kenscoff to the south of Port-au-Prince and north of Sourçailles.

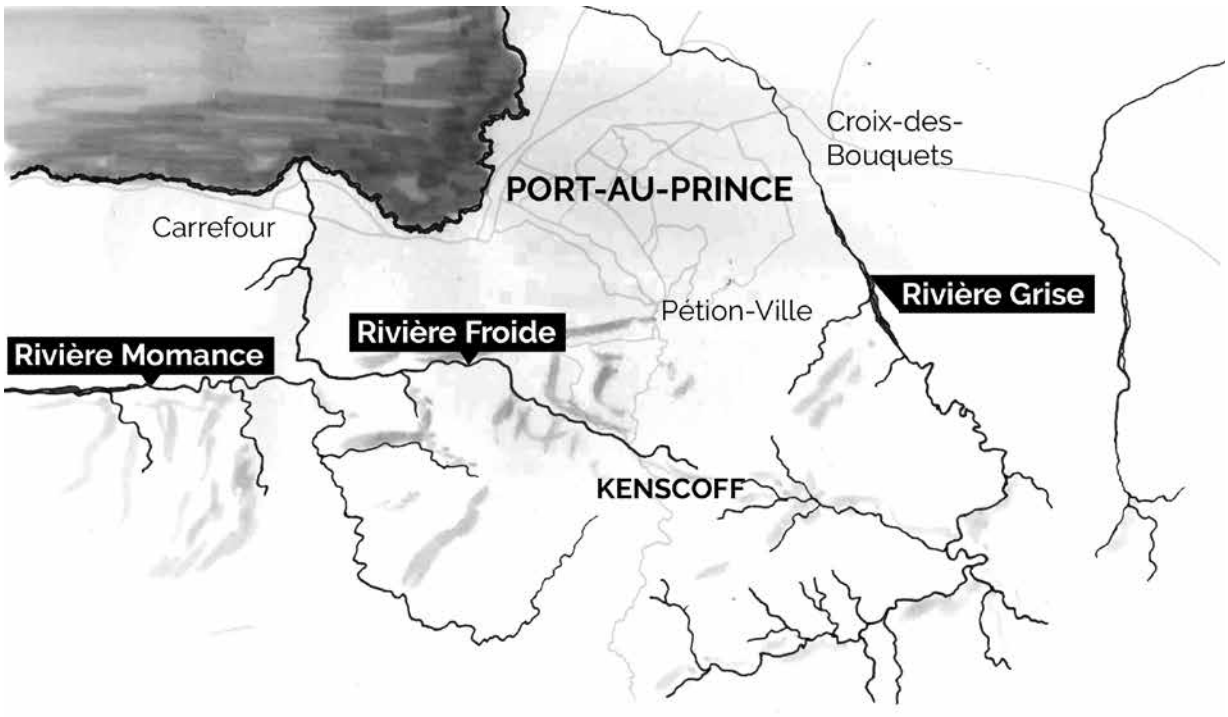
John Naylor (JN): Please could you describe the Wynne Farm Ecological Reserve, the foundation, and the farm? Please also tell us about its history, and your interests in bamboo.

Jane Wynne (JW): Wynne Farm Ecological Reserve, which is at an altitude of 6,000 ft, is situated in the cloud forest of Kenscoff, Haiti *[1]*. This is the place where most of the vegetables and fruits that go to Port-au-Prince and Petion-Ville come from, and where a lot of people come for leisure. Before arriving in

2 Victor A. Wynne.

3 Cut Phyllostachys aurea bamboo in Kenscoff, Haiti.

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press



4 A sketch map showing the Kenscoff area to the south of Port-au-Prince, and north of Sourçailles, showing how the three rivers (Momance, Froide, and Grise) collect water from this and the wider Sourçailles region to the south. Deforestation in this area has a major impact on the water security and flood risk to the Metropolitan Port-au-Prince area.

5 Deforested hillsides to the south of Kenscoff, Haiti.

Kenscoff, we lived in Carrefour where I was born, and where my father, Victor A. Wynne *[2]*, saw that the Rivière Froide was sometimes reddish. One day he took us on a ride, high in the mountains, to see where the river was coming from. We saw red subsoil on top of white limestone, which was not very rich.

In 1956, my parents decided to buy small plots of land with the idea of creating a pilot farm for teaching soil conservation. Since the land was mostly denuded, he bought manure and small trees to rebuild the land. Being an engineer with a knowledge of geology, he understood the soil. He followed what the Incas had done in Machu Pichu, Peru, and built terraces on the lower side of the farm. Later on, he designed a grid system for planting on slopes. Vertical ridges were built on both sides of rectangles where fruits and vegetables were planted. Shrubs were planted on the slopes. With the approval of the Department of Agriculture of Haiti and of the US, he imported seeds from the Caribbean and different temperate zones to reforest the area. After some investigations, he identified how bamboo could stop the soil running off with the water. In general, farmers do not practice soil conservation in Haiti. The word Ayiti (Haiti) means 'Land of High Mountains'. You can imagine how much erosion we have because people plant on slopes where one would not imagine to walk or climb.

Sir Albert Howard, a scientist and agriculturalist suggested that 'soil is the capital of a nation' and that, when a nation loses its soil, this nation is gone. Haiti is on that path, and it hurts to see it. Victor suggested planting bamboos in ravines to hold the soil. Out of ten varieties of bamboo that he imported, two adapted very well: *Phyllostachys aurea [3]*, a running bamboo for holding the soil; and *Guadua angustifolia*, a clumping bamboo for construction. Phyllostachys can be invasive so some people say it is not good if we are protecting biodiversity but, in this case, it helped for holding soil in the ravines away from where farmers were planting vegetables.

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press

JN: Sourçailles, in the commune of Kenscoff was declared a Protected Area by President Jovenel Moïse in 2021. Could you tell us a little more about this Protected Area, and its importance to urban Port-au-Prince?

JW: This Protected Area, of 499 hectares, is called Parc National Naturel des Sourçailles. I rejoiced when I heard about the decree to protect the area because Wynne Farm would not have been able to do it alone. This place is the birthplace of three rivers [4], and therefore it plays a strategic role. One of them is the Rivière Momance that goes to Léogâne, the second is the Rivière Froide that goes down to Carrefour, where I was born, and the third is Rivière Grise that goes to La Plaine and Croix-des-Bouquets. It is also the home of a network of watersheds that distribute water to the Pétion-Ville area, Port-au-Prince, Delmas, Tabarre, Croix-des-Bouquets, and Carrefour. As these rivers are already drying up, truckloads of sand and rocks are being removed from the riverbeds. We *must* protect the park for its natural resource – water – but also as a place for connecting the rich biodiversity of the surrounding areas.

JN: Could you tell us about the present ecological situation and the deforestation including a bit of the history, and also describe some of the effects of deforestation as well?

JW: No-one is stopping the destruction of the 'Pearl of the Antilles', once a nickname for Haiti. The situation of the ecological system in Haiti is in a state of pre-disaster, and most of the ecosystems are degraded. The coral reefs are in bad shape. Mangroves are being cut for the production of charcoal. The cactus desert on the way to Gonaives – a potential botanical garden – is being replaced by construction. A place so rich in biodiversity is being destroyed.

We are also losing deciduous forests. The cloud forests or the pine forest that used to be called the 'Lung of the Caribbean' is practically gone.

Haiti used to be a rich island before Christopher Columbus arrived, and during the colonial times, a lot of precious wood was exported to Europe, mostly to France. Wood like *taverneau* and mahogany have been depleted. After the independence of Haiti, cutting trees for making charcoal has become one of the worst nightmares. Today people are making more charcoal because of a lack of propane. This is where I feel we need an alternative like bamboo to replace wood for fuel, as they have done in Indonesia and Africa.

Until now, there has been no management of the country's ecology and disasters have become catastrophes. There is pollution as a result of burning rubbish, wire tires and Styrofoam plates, which remains in the air. The worst case is the overuse of chemicals. Herbicides have polluted the soil and water. On account of excess chemical insecticides, the numbers of bees and butterflies to pollinate the flowers have dwindled.

JN: Here's just one image of the effects of the deforested hillsides after a hurricane or a heavy storm *[5]*. It seems to illustrate what you said about the ravines.

JW: Deforestation is a very common word now in Haiti as trees are cut for all kinds of uses. Since there is hardly any soil conservation practiced, soil and water inundate roads and houses when trees are removed and it rains. When the soil is gone there are no crops – even tea leaves are rare – and no jobs, no revenue, no education, no healthcare, no water or electricity. All this leads to social injustice. The reaction of the people is to take matters into their own hands and form gangs to protect businesses, drug

6 Bambusa vulgaris 'Vittata' (also known as Bambusa vulgaris 'Striata') at FONDIMM in Marmelade, Haiti.

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press

dealing for guns, and kidnapping for ransom. The problem is profound. When the ecosystem is not alive, and there is no biodiversity to serve the people, the country becomes unstable. That is the situation. This brings us back to the core cause, which is that we have lost the soil. If we return to bamboo, we can catch some of the soil by planting in the ravines, through soil conservation and by replanting trees.

JN: What particular species of bamboo are available?

JW: In the Kenscoff area, as in many parts of Haiti, there's *Bambusa vulgaris* in different varieties, one of which we have at the farm. There is *Bambusa vulgaris 'Striata'* in Marmelade *[6]*, plus *Phyllostachys aurea*. At the farm we also have: *Dendrocalamus giganteus*; *Phyllostachys edulis* or *moso* bamboo given by Gilbert Viala; *Guadua angustifolia* for construction; *Bambusa multiplex*, perfect for crafts, especially flutes because of its long internodes; and *Bambusa lako*, a black bamboo *[7]*. Other centres where bamboo is produced include: Seguin, with mostly *Phyllostachys makinoi*; the Organisation for the Rehabilitation of the Environment (ORE) in Camp-Perrin around Jacmel; and finally in Marmelade, which is the biggest source of bamboo I would say, especially the Guadua. President René Préval, with the Taiwanese government, started a project known as The Foundation for the Sustainable and Integrated Development of Marmelade (FONDDIM) to grow and develop the economy there.[2] John, could you tell us some types that you saw on your visit?

JN: Yes. In 2016 we were in Marmelade for our AA workshop. We were able to use some of the *Phyllostachys makinoi [8]*. There is also *Bambusa oldhamii*. Then of course there's a lot of Guadua *[9]* as well as *Bambusa stenostachya*, which we used for construction, harvested in Marmelade *[10]*. In addition to what is in Kenscoff, Marmelade is a good asset for the future of bamboo in Haiti.

Given the way that you describe the current context of Haiti, could you expand on how you think bamboo can support the national economy of Haiti?

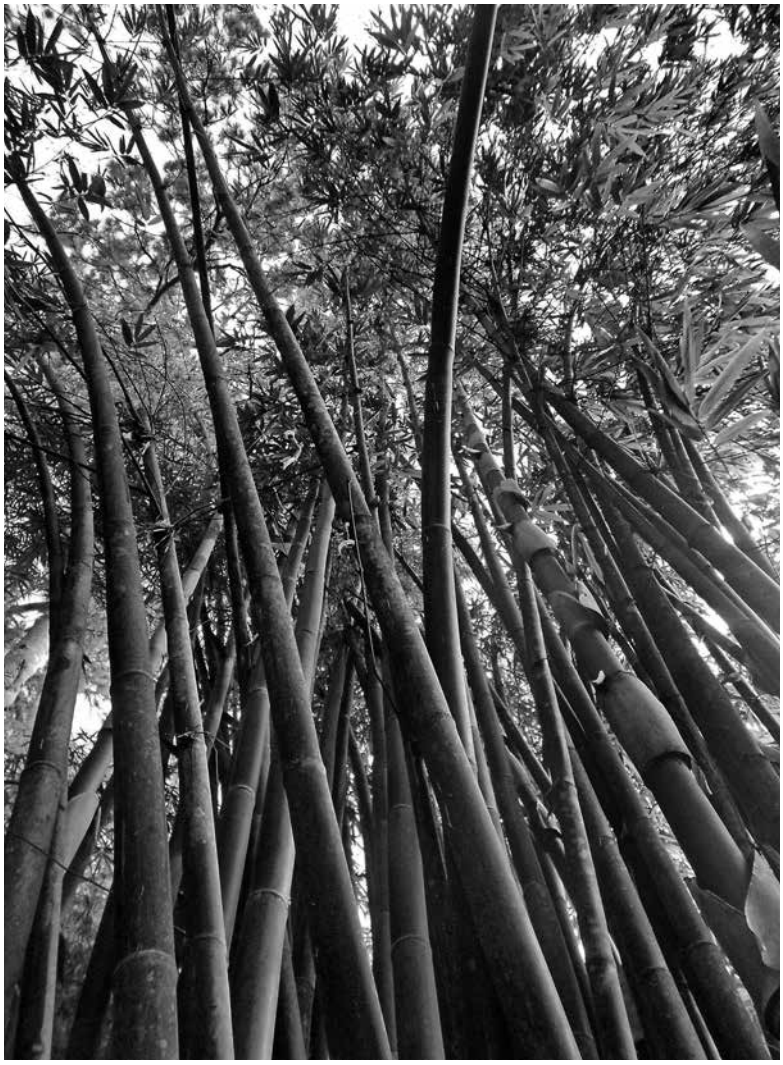
JW: One support provided by bamboo in *Jérémie* has been through the fabrication of rafts that carry merchandise down the river. When they reach their destination, they are sold to fishermen who make cages or nets for fishing. In Kenscoff, there are groups of young men who make furniture mostly with *Phyllostachys* because the termites don't like them as much as the *Bambusa vulgaris*. Sometimes bamboo is used to replace 2x2" or 2x4" timbers in making roofs. To enhance the Haitian economy, there are other plants that could be combined with bamboo, as identified by the *Her Many Voices Foundation* which has been supporting Wynne Farm, for example exploring the use of hemp as a companion for bamboo in construction.

JN: Are there ways that bamboo products can both support the economy and protect the environment? I am thinking particularly of Styrofoam plates, something that you've talked about in the past.

JW: The number one pollutant of the environment is the Styrofoam plate. They are everywhere, from the mountain to the ocean. We could create small factories that can use young bamboo shoots, less than three years old, mixed with banana leaves to make plates. That would help to protect the environment and support the economy. Since bamboo grows faster than trees, we could cultivate more bamboo to export to the Caribbean, and also to use in Haiti as a good replacement for wood.

JN: We know bamboo is there, and has great potential, but what are the current impediments to developing an economy with bamboo, for example furniture making and other products?

JW: The number one problem all over Haiti that has to be solved is land tenure. This presents a very difficult challenge. People always



7 Bambusa lako growing in Kenscoff, Haiti.

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press

8 Phyllostachys makinoi growing in Marmelade, Haiti.

try to reclaim land that was their grandfather's even though it was sold. They would feel they have the right to harvest until you bring the case to court and prove the contrary. The second challenge is knowledge about bamboo: when to harvest, what tools to use, etc. The third challenge is for the bamboo market outside of Haiti to absorb the surplus.

JN: Do you have first-hand experience of the local population in Kenscoff growing bamboo?

JW: Years ago, they did not give it much importance. Nowadays there are more bamboo activities in the area. One sees bamboo plants for sale in the streets, bamboo balconies, bamboo fences, bamboo stands, bamboo bars, and truckloads transporting bamboo culms to the city. Some are making bamboo furniture for sale. Wynne Farm has a project with school children to plant passion fruit. The harvest will help pay tuition, and to plant bamboos in ravines next to homes to help retain soil. Those who grow bamboo can sell the culms to Wynne Farm, which can distribute those culms to the students for supporting the sweet passion fruit vines.

JN: What do you think are the attitudes of the community in

9 Guadua angustifolia growing in Kenscoff, Haiti.

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press

10 Harvesting a piece of Bambusa stenostachya at Marmelade, Haiti on the AA Haiti Visiting School, 2016.

Kenscoff to living in a house made with bamboo?

JW: Well, people are using bamboo for porches and furniture. No-one has yet built a bamboo house to live in, but if they see people actually living in them, I think they will want to live in one too.

JN: Are you optimistic about the future of bamboo in Haiti?

JW: Yes, very. People say bamboo is too invasive. But they don't understand the difference between clumping bamboo and running bamboo. My hope is to use bamboo to hold the soil in the ravines. My two passions, that I got from my father, are the soil and bamboo. Sometimes I feel I am the soil, so if bamboo can help sustain me, as soil, to keep me from going down in the ravines to the ocean, then I have hope for bamboo. As for construction, my hope lies in the use of bamboo as an alternative for the wood being harvested by cutting trees. Maybe in a far future, they can use wood again. But if we can teach people to use bamboo, it could make such a difference in just five to ten years.

Notes

1. John Osmond Naylor, Nancy Leconte, Franck Reginald Michel Vendryes, 'Education to Practice to Ecology: A Review and Preliminary Evaluation of a New Architectural Design Curriculum Using Computational Design Tools and Bamboo in Haiti', in *SIGraDi 2020 Proceedings of the 24th Conference of the Iberoamerican Society of Digital Graphics*, Online Conference 18–20 November 2020, ed. by Natalia Builes Escobar and David A. Torreblanca-Díaz (Medellín, Colombia: Blucher Design Proceedings, 2020), pp. 643–51.
2. HaitiLibre, 'Bamboo Benches in Schools', *HaitiLibre* (2014) <https://www.haitilibre.com/en/news-12042-haiti-education-bamboo-benches-in-schools.html> [accessed 10 November 2021].

Illustration credits
arq gratefully acknowledges:
The Authors, all images

Acknowledgements
The Bamboo in Haitian Construction Symposium was supported by the Global Partnership Fund administered through Newcastle University's International Relations and Partnerships team. The authors would like to thank Dr Kent Harries, Chase Rogers, Nancy Leconte, Isabelle Jolicoeur, Jupille Facile, Rose Di Sarno, Elrica Metayer who provided support, insight, and expertise, although interpretations, conclusions, and any errors in this article are the authors' own. More information on the Wynne Farm Ecological Reserve can be found at <www.wynnefarm.org> [accessed 11 December 2023].

Competing interests
The authors declare none.

Authors' biographies
Jane Wynne was born in Carrefour and is a steward of the Wynne Farm Ecological Reserve in Kenscoff, Haiti. The farm prioritises soil conservation, employing terracing and environmentally friendly cultivation techniques. Building on the farm's foundational practices, Jane addresses Haiti's deforestation and advocates for sustainable agricultural approaches. She studied at Union School in Haiti and 'Anna Maria College, Paxton, Massachusetts, US, earning a degree in Sociology. She has collaborated with several organisations including the Federation of Friends of Nature, GAFE, Her Many Voices, Earth Givers, and the Smallholder Farmers Alliance.

John Naylor is a UK-based architect and educator at the AA Visiting School. He gained his diploma at the Architectural Association in 2013, winning the Foster's Prize for Sustainable Infrastructure. He has worked at MAD, Beijing and Grimshaw Architects, London. In 2014 he set up the AA's bamboo Visiting School programme in Haiti, which continues as the AA-ITB BambooLab global programme. He is currently studying for a PhD at Newcastle University examining capacity-building design awareness for bamboo, incorporating digital tools, with a continued focus on Haiti.

Authors' affiliations
Jane Wynne, Wynne Farm Ecological Reserve, Haiti.
John Naylor, Newcastle University, United Kingdom.

Authors' addresses
Jane Wynne
jane@wynnefarm.org

John Naylor
j.naylor73@newcastle.ac.uk

https://doi.org/10.1017/S1359135523000325 Published online by Cambridge University Press