Equator Initiative Case Studies
Local sustainable development solutions for people, nature, and resilient communities

BAMBOO VILLAGE OF PHU AN
Viet Nam

Equator Prize Winner

Empowered lives. Resilient nations.
Local and indigenous communities across the world are advancing innovative sustainable development solutions that work for people and for nature. Few publications or case studies tell the full story of how such initiatives evolve, the breadth of their impacts, or how they change over time. Fewer still have undertaken to tell these stories with community practitioners themselves guiding the narrative.

To mark its 10-year anniversary, the Equator Initiative aims to fill this gap. The following case study is one in a growing series that details the work of Equator Prize winners – vetted and peer-reviewed best practices in community-based environmental conservation and sustainable livelihoods. These cases are intended to inspire the policy dialogue needed to take local success to scale, to improve the global knowledge base on local environment and development solutions, and to serve as models for replication. Case studies are best viewed and understood with reference to ‘The Power of Local Action: Lessons from 10 Years of the Equator Prize’, a compendium of lessons learned and policy guidance that draws from the case material.
PROJECT SUMMARY

The village of Phu An, located north of Saigon, was heavily bombed during the Viet Nam War. The Bamboo Village of Phu An has created an Eco-Museum of Bamboo and Botanical Conservatory with the aim of conserving biodiversity, protecting the region’s bamboo forests, and helping to “transform the iron triangle into a green triangle.” The initiative carries out conservation activities to protect and restore Viet Nam’s bamboo, including endangered species from across the country. More than 350 varieties of bamboo are stored in its museum and botanical conservatory.

This pioneering project has brought tangible economic rewards to the Phu An community, whose members are trained in the production of artisanal bamboo handicrafts. A total of 3,000 families have benefitted from the Bamboo Village, and out-migration from the area to urban centres has reduced significantly.

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KEY FACTS

EQUATOR PRIZE WINNER: 2010

FOUNDED: 1999

LOCATION: Phu An village, Binh Duong province

BENEFICIARIES: farmers, youth, school children

BIODIVERSITY: 350 bamboo specimens
The village of Phu An, located north of Saigon in Binh Duong province, was heavily bombed during the Vietnam War. The Phu An Bamboo Village has created an Eco-Museum of Bamboo and Botanical Conservatory, which aims to conserve biodiversity and protect the area's bamboo forests, a vision to “transform the iron triangle into a green triangle”. The initiative focuses on bamboo conservation, and endeavors to create jobs in traditional bamboo arts and crafts that can improve local livelihoods. The Eco-Museum of Bamboo and Botanical Conservancy carries out conservation activities to protect and restore Vietnam's bamboo, including twenty endangered species in the south-east of the country.

Bamboo cultivation for local ecosystems and livelihoods

The ecosystem of the village of Phu An is centered around the Saigon River, which provides the local population with the essential ecosystem services of freshwater provision, soil and nutrient cycling, timber, food, carbon sequestration, and more. The surrounding forests were severely degraded due to wartime activities, and have since declined further due to anthropogenic pressures. However, a highly diverse agro-ecosystem extends from the lowlands near the river up to the highlands where bamboo, cashew, fruit, and rubber trees are cultivated and form the basis of local livelihoods. The riverbank ecosystem also retains an abundance of biodiversity. Fish, eel, and shrimp provide the local population with a measure of food security, riverside plants are used for cooking and medicinal products, and rice paddies thrive on the floodplain, providing food and an additional source of income. Among the most important of resources in this ecosystem is bamboo.

As a resource, bamboo has a long and unfortunate history in the region of mismanagement, undervaluation, and unsustainable exploitation. Traditional methods of farming bamboo have tended towards indiscriminate harvesting techniques, with farmers often cutting bamboo stalks and shoots before they have reached full maturity or been able to reproduce. So too, economic isolation and marginalization in the village and surrounding region has forced the local population to place unsustainable pressure on surrounding bamboo forests to meet subsistence and livelihood needs.

The roots of an idea, a ‘bamboo village’

At this confluence of deepening poverty and environmental decline, architects of this project set out with a vision of improving the wellbeing and livelihoods of the local community by making use of traditional knowledge systems in medicinal plants and cooking. In particular, the initiative wanted to target bamboo, recognizing that the plant is endowed with properties – rapid growth, hardness, and sheer volume of timber production – that make it uniquely well-suited to efforts in poverty reduction, landscape restoration and soil erosion control.

The idea emerged of transforming Phu An Village into an ecological restoration and conservation area, where local residents were championed as managers and stewards of natural resources, biodiversity and traditional knowledge. The name and concept of ‘Bamboo Village’, which was originally proposed to the community in 1999, was met by a mixed response from community members; not all villagers were convinced that win-win solutions in sustainable livelihoods and conservation were possible, and the concept of reducing poverty through environmental restoration activities was still relatively new to much of the community and local authorities. Several informational meetings and consultations were held to clarify the idea and to generate ownership and buy-in from all relevant stakeholders. Gradually and incrementally, local residents and farmers committed to the shared vision.

One of the most contentious obstacles to generating wholesale buy-in from farmers was the property rights and land tenure issue. If the community was to create an eco-village with a collective land management ethos, individual farmers would need to surrender their alienation rights, and along with it the option of selling their
land to commercial industries which often offer high premiums. The initiative worked through the elected body responsible for all administrative activities pertaining to the village, the Popular Committee, to explain to community members the rules surrounding the agreement and the new parameters for property sales. Over a period of several years, the hold-out farmers began to see the environmental and social problems caused by factories and commercial industries in neighboring villages, and, motivated to be part of a solution for community wellbeing and protecting the environment, consented to abide by the new regulations that would ultimately create Phu An Bamboo Village.

The initiative has since dedicated its activities to restoring the region's biodiversity based on the research, knowledge and active participation of the local community. The idea of not only conserving bamboo, but of protecting the genetic diversity of bamboo species, has taken the form of a Bamboo Eco-Museum and Botanical Conservancy, which currently houses more than 350 specimens of bamboo. Occupancy for the ten hectares of land on which the conservancy is located was granted by the provincial government.

**Governance and organizational structure**

Phu An Bamboo Village has fifteen permanent staff members, including four researchers, five technical engineers, four farmers, and a core executive leadership drawn from the village women's union. Student volunteers are added to the team seasonally and on an as-needed basis. The organization emphasizes participatory decision-making. Ideas for new activities and strategic directions for the organization are presented to and discussed with the entire community before any collective decision is taken. Community consultations and discussions usually take place in meetings with the women's union and with village farmers.

“Conservation of biodiversity equals conservation and sustainable improvement in the quality of life of local people through the sustainable use of resources in order to increase the supply of those resources while protecting the environment.”

*My Hanh Diep Thi, President, Bambou Village de Phu An*
Phu An Bamboo Village key activities correspond with its four primary objectives: i) improve agricultural production, ii) conserve Viet Nam’s bamboo and endangered species, iii) promote and enhance the value of natural resources, as supported by research, and iv) contribute to sustainable development. Project activities benefit the more than 3,000 families that constitute the village of Phu An.

**Improving agricultural productivity**

In the area of improving agricultural production, the organizational focus is primarily on bamboo and increasing the number and quality of stalks harvested each season. Good harvesting practice and sustainable bamboo management techniques are shared with village farmers. A good deal of outreach and interactive learning has been dedicated to reversing previous trends of cutting bamboo culms before they reach full maturity. Farmers also receive training in value-added secondary processing – transforming raw bamboo into secondary products such as furniture and handicrafts, which can then serve as supplementary sources of income. The initiative also provides farmers with advice on how to select the most appropriate bamboo seed or variety for a specific goal. For example, the initiative promotes certain bamboo varieties for the restoration of farms or landscapes that are particularly degraded, and others for farmers looking to respond to market demands.

**Bamboo conservation**

The group’s main activity in biodiversity conservation is the operation of a Bamboo Eco-Museum and Botanical Conservancy. The information and conservation center has the goal of preserving bamboo species and genetic diversity. The center was constructed with financial support from the region of Rhone Alps in France and the province of Binh Duong. It houses more than 350 specimens of bamboo, including threatened and endangered forest species found in few other areas of Viet Nam, as well as more common species used in landscape restoration and to produce handicrafts. Prior to populating the herbariums and conservatory, the organization’s researchers undertook a thorough and arduous process of documentation, collecting specimens of bamboo from across the entire country. The end result has been a singularly unique concentration of bamboo species in one center, offering research opportunities on bamboo taxonomy, ecology and ethno-botany.

**A research center for strategic reforestation**

The organization also carries out research activities on how to enhance the value of bamboo. The Bamboo Eco-Museum and Botanical Conservancy serves as a research center. Ongoing experiments are conducted on the particular physical-chemical properties of each species of bamboo. The species are then classified according to their best use. This information is shared with local farmers to provide guidance on selecting appropriate varieties of bamboo for production, restoration, crafts, and industrial goods. For example, individual species of bamboo are recommended based on specific properties such as hardiness, growth patterns, and timber production. The organization is also committed to species diversification and encourages farmers to plant several varieties of bamboo. This approach helps local farmers adjust and adapt to changing market demands – some species are better suited to paper pulp, others to wall and floor coverings, and even others to toothpicks, baskets, and construction material. Researchers are constantly collecting new varieties of bamboo to respond to the requirements of each new sector they explore. The initiative has tested the qualities of different bamboo species for soil decontamination and sewage treatment (or phytoremediation), carbon sequestration, and industrial construction strength. A program to identify the DNA sequences of different bamboo varieties is currently underway. This program is being designed to help facilitate the accurate identification of species properties.

In the area of sustainable development, the group undertakes a range of activities designed to empower and enable local farmers to improve their quality of life. The approach emphasizes equipping...
farmers with the tools, information and resources necessary for them to make informed and productive decisions. Communication and outreach are the cornerstones of this activity area. Environmental education focuses on village children and university students, encouraging active participation in conservation efforts and instilling a spirit of collective responsibility for the wellbeing of the community and its surrounding forests. Phu An Bamboo Village also trains farmers in soil fertility and conservation, organic farming techniques, watershed protection, and waste management.

**Traditional knowledge, new technologies**

Among the group’s most noteworthy innovations has been the blending of traditional knowledge and cutting-edge research on bamboo conservation and management. The initiative is constantly testing, adapting and applying new technologies, including in the groundbreaking area of phytoremediation, which could reveal an important role for certain bamboo species in wastewater management and the treatment of contaminated soil. Researchers have also made important strides in demonstrating that bamboo fibers can be used in biocomposites, and that bamboo charcoal can be used in activated carbon. Further, researchers have been able to determine how different species of bamboo adapt to new living conditions as well as the most effective cutting, replanting, transplanting, and fertilizing techniques.

To date, the organization has collected 450 taxa of bamboo from Viet Nam, Cambodia and Laos. For each taxon, they have established 12 groups with 102 descriptors. The group has also undertaken extensive documentation on traditional knowledge as it relates and applies to bamboo cultivation and management. The combination of these two exercises will form the basis of bamboo DNA database, which will publish morphological data so that a wider community of farmers and conservationists may benefit from this knowledge.

“Biodiversity conservation should be a goal of globalization and international cooperation in the equality of peoples. To conserve biodiversity, it is necessary to train personnel working on the conservation of biodiversity; it’s an essential human resource. A law should be created regarding the processing of natural resources into commercial products in order to provide income for poor people.”

My Hanh Diep Thi, President, Bambou Village de Phu An.
Impacts

BIODIVERSITY IMPACTS

Prior to the initiative, there were only seven varieties of bamboo in Phu An. Since 1999, the village has grown that number to 350 specimens. These were collected from across Southeast Asia, and include 20 threatened or endangered species. The Bamboo Eco-Museum and Botanical Conservancy has been developed to conserve these species and to make them available to local farmers. One objective is informational – to display and profile the different uses of bamboo species, thereby improving local knowledge of and appreciation for conservation efforts. The center also provides visitors with a history of Phu An, information on the characteristics of bamboo species, and results of research undertaken on biodiversity, soil fertility, and environmental protection.

Combining research with environmental education

Research and environmental education are closely wed in the project model. Researchers maintain up-to-date, public information regarding bamboo species that have been collected and planted. Research aims to contribute to knowledge expansion on natural resources; to determine the adaptation conditions of bamboo, as well as proper techniques for cutting, transplanting and fertilizing; and to study soil fertility conservation techniques and potential improvements in agricultural production.

As a result of outreach efforts, the community has been inspired to conserve local biodiversity and sustainably manage their natural resources. As one example of many, villagers have started to replant and cultivate black-spotted bamboo (*Bambusa gibboides*), an endangered species that has comparative qualities for craft production.

Environmental education has also targeted school-aged children. Conservation classes are offered on a weekly basis and field trips are offered to children from across the country. Children have been an effective conduit for spreading the organization’s conservation ethic, passing on to their parents lessons on the value of environmental protection and waste management.

A unique catalogue of bamboo varieties

Research, documentation and outreach activities have filled an existing gap in knowledge and literature on bamboo species conservation. The organization realized it had a role to play in identifying additional species and elaborating sustainable management measures. Researchers embarked on a mission to document and collect species from across the country. In the end, research was conducted in 43 of the 64 Viet Nam provinces, with 103 specimens collected from the north, 42 from the center, 59 from the highlands, 46 from the southeast, and 51 from the Mekong Delta. These 301 samples belong to 130 species of bamboo and 17 genera, accounting for almost 90% of bamboo varieties in Viet Nam. Geographical locations were noted, allowing the organization to map threatened endangered species. Samples were planted in the village conservatory, an activity which has deepened knowledge on transplanting and multiplication methods. In addition, seeds from 22 rare and 8 threatened, non-bamboo species of flora were collected from other parts of the country and successfully planted in the conservatory. The eight threatened species collected were *Aquilaria crassna* Pierre, *Sindora siamensis* Teysm, *Pterocarpus pedatus*, *Shorea roxburghii* G.Don, *Afzelia xylocarpa* (Kurz) Craib, *Anisoptera costata* Korth, *Dalbergia bariaensis* Pierre, and *Scaphium macropodium*.

Phytoremediation and wastewater treatment

Phu An Bamboo Village also works to improve soil health, conserve watersheds (and, by extension, local access to potable water), and protect plants along the Saigon river. The village depends on the river not only for water, but to meet many other basic needs. Due to rapid and largely unregulated industrialization, the river has suffered from heavy pollution. In the early 2000s, local authorities of Binh
Duong province became concerned with the problem and started to impose stricter regulations on local industrial plants, including implementation of clean technologies and fines for offending polluters. No provisions were made, however, for cleaning up or restoring land and soil that had already been contaminated. To fill this gap, Phu An Bamboo Village began its research on the potential of bamboo for phytoremediation. Findings to date have been encouraging, including the potential of *Lantana camara* and *Bambusa* for hyper-accumulation of heavy metals (an important property in soil decontamination) and, in the case of the latter species, wastewater treatment.

The wildlife of Phu An was essentially wiped out during the war, and has only recently begun to recover with help from the Bamboo Village initiative. Before 1999, for example, birds were rarely seen in Phu An. Since creation of the bamboo conservancy, many bird species – turtle doves, Pagoda roosters, sparrows and egrets – have returned and found refuge from poachers.

**SOCIOECONOMIC IMPACTS**

Before the project began, the village suffered from high rates of poverty. In addition to a lack of viable livelihood alternatives, poverty was exacerbated by the mismanagement (and subsequent depletion) of natural resources. This trend was particularly prevalent in bamboo management. The common practice of cutting immature bamboo stalks was both less profitable and less sustainable than allowing the stalks to grow to full maturity. Phu An Bamboo Village addressed this problem by offering trainings to local farmers in sustainable harvesting techniques for different bamboo species. Although cashew, rubber, and fruit trees are also abundant in the area, the initiative selected bamboo as its primary focus due to its diversity, adaptive capacity, and growth rates. (Bamboo is one of the fastest growing plants on Earth).

**Organic farming and improved agricultural productivity**

The socio-economic impacts and benefits resulting from the initiative have been multifaceted. Initial support for the project provided by the Swiss NGO Helvetas was directed towards improving agricultural practices by providing 64 of the poorest families in the village with organic fertilizers. Since that time, Phu An Bamboo Village has built on that commitment by training farmers on techniques to improve soil fertility, such as earthworm composting and sowing nitrogen-fixing plants. Participating families have been able to substantially and sustainably increase their bamboo production. Biodiversity and ecology research activities have also led to improvements in agricultural productivity and outputs. Bamboo species collected by the conservancy are made available to village farmers, who then produce seedlings to sell or plant in their own plots. Access to increased stock and diversity of bamboo species has in turn resulted in greater revenues and income supplementation. In 2009, 10 farmers produced 5,000 cuttings which brought them each a profit of roughly USD 500 USD – what for the average unskilled laborer would be the equivalent of a 10-month salary.

**Value-added secondary processing and poverty reduction**

Job creation and livelihood diversification have also been project outputs. As just one example, permanent jobs have been created for a number of landless youth. The initiative has provided training for poor young people in making value-added products and crafts from bamboo. This intervention has provided young villagers with a new trade, skill-set and source of income. Along with other village development activities, there has been an 80% reduction in poverty in the village since the initiative began. Improved livelihood options have also resulted in slowed or reduced out-migration to urban areas. The initiative is also in the process of developing an eco-tourism program – a 15 kilometer hiking trail has been created – which would give farmers another revenue stream to supplement their agricultural incomes.

**Women's empowerment, health and education**

Phu An Bamboo Village has collaborated with the village women's union on a number of social programs aimed at improving opportunities for women. The women's union, a socio-political organization that helps women improve their purchasing power and gain equality at the household level, has been a valued collaborator in training local women in bamboo crafts and furniture. Revenues from these products give local women a degree of financial independence, while also allowing them to attend to the traditional domestic responsibilities of child care, etc.
Education and outreach activities have raised local awareness of environmental, agricultural and health issues. In addition to outreach seminars – which have included the participation of more than 100 farmers – the group has worked to improve local living conditions through new knowledge. Where fresh water access and water-borne diseases were previously problems in the village, 100% of families now boil their water. Awareness campaigns have also successfully promoted recycling, introduced the concept of food safety and the benefits of organic crops, and promoted the traditional culinary and medicinal uses of indigenous plants. One example of the latter, the bark of Bambusa vulgaris var. stricta is now widely used in the village to treat skin diseases and the buds of bamboo leaves to treat certain childhood ailments.

**POLICY IMPACTS**

At the beginning of the project, Phu An Bamboo Village worked through the local People’s Committee to obtain consensus among villagers on creation of the eco-village. At this level of local policy, obstacles faced were linked to a lack of local knowledge on the imperative of natural resource conservation, as well as the potential short- and long-term benefits they could reasonably expect. Environmental education and awareness-raising campaigns were key factors in achieving village consensus on the project model. In 2002, the province of Binh Duong signed the agreement which formally created and legally incorporated the eco-village. This move to incorporation changed the landscape of local land policy options (as well as the potential for industrialization), as villagers relinquished their rights to sell their individual plots of land to extractive industries.

At the national level, Phu An Bamboo Village has been influential in the shape, form and substance of biodiversity legislation. Prior to discussing the laws on biodiversity in the National Assembly, the provincial deputy of the People’s Council organized meetings with researchers and representatives from the initiative, inviting their opinion and expert guidance. Having incorporated the advice of researchers and Phu An Bamboo Village representatives, national laws have been put in place to mainstream biodiversity conservation into school curricula. Phu An Bamboo Village has also served as a training site for ‘ground-truthing’ this approach.
**SUSTAINABILITY**

Certain key elements instituted when the initiative was started have provided the foundation for long-term sustainability, notably including: public participation and consultation in defining the project, emphasis on the equality of women, combining the objectives of biodiversity conservation and sustainable livelihoods, and prioritizing environmental education, outreach and communication strategies which would have resonance with local villagers. As the project has grown and matured, villagers have increasingly been able to see and experience the environmental and economic benefits. Reduced poverty levels have reduced pressure put on environmental resources.

In terms of financial sustainability, Phu An Bamboo Village receives funding from donors to conduct research and to teach. The organization is, however, seeking to expand its project activities to create new and lucrative revenue streams. Future plans include the development of an ecotourism initiative. The group expects that rapid growth in Binh Duong province will create a “need for green” among the more affluent populations of urban and suburban zones. While the village already receives a number of visitors, the existing accommodations and local infrastructure are insufficient for absorbing large numbers of tourists. They are currently developing a plan for water and sanitation infrastructure. Wherever possible, local farmers will be included in ecotourism ventures and activities.

**REPLICATION**

Phu An Bamboo Village shares knowledge through various communication channels, including university courses, field trips for children, seminars with farmers, guided tours for visitors from other regions of the country, newspaper articles, radio and television programs, a website, national and international conferences, and the publication of research. The initiative also disseminates research findings and results to other regions, national parks, conservation centers, and private plantations. Knowledge dissemination has reached as far as research institutes in Cambodia and Laos. For example, Phu An Bamboo Village researchers worked with the Royal University of Phnom Penh and the Forestry University of Laos to conduct two exploratory missions. Researchers from all three universities were present at these missions. The first, in December 2008, was focused on the left bank of the Mekong River from Phnom Penh to Vientiane, with 40 taxa collected. The second, in December 2010, focused on the northeast of Laos and the northwest of Viet Nam with 50 specimens collected.

**Transfer of a successful model**

Phu An Bamboo Village has shared its model with the village of Hung Phong in the Mekong Delta to protect their natural resources (primarily coconut) and reduce poverty through development of handicrafts and ecotourism. This community of 1,500 inhabitants in the Ben Tre province is currently applying the conservation and livelihoods model, which has been adapted to the conditions of that area. Additionally, a project is underway in the highlands to create a second bamboo village. The organization will have a comparable objective of conserving endemic bamboo species and creating jobs for an indigenous population which now relies heavily on poaching and unsustainable extraction activities to meet subsistence and income-generation needs. The hope is that through replicating their model and learning from their experience, neighboring projects can avoid some of the difficulties encountered by Phu An Bamboo Village while identifying innovations appropriate to their circumstances.

**PARTNERS**

The Phu An Bamboo Ecomuseum and Botanic Gardens were created in the framework of a four-part cooperation project. It included the Rhone Alps Region (France), the Binh Duong Province (Viet Nam), the Pilat Regional Nature Park (France), and the University Of Natural Sciences of Ho Chi Minh City (Viet Nam). The conservatory is considered a research center for the University of Sciences, but the University does not provide funding since,
according to the February 2008 law no. 115, the University decided that its research centers should be autonomous.

The village of Phu An and its institutions (the Popular Committee, village chief, Women's Union) provide on-going momentum for the conservation of natural resources and the socioeconomic development of the village. The province of Binh Duong provided the land (10 ha) to build the eco-museum and the conservatory and contributed financially to the construction of the building, while the University of Science (a member of the Vietnam National University) and the National Museum of Natural History, Paris, helped to canvass and collect bamboo specimens and endangered species for the conservatory.

The Swiss NGO Helvetas was a founding partner and provided support until 2000. Some of their projects included a micro credit program, gender equality promotion, and a workshop for apprenticeship in bamboo craft-making. But above all, Helvetas was indispensable in providing the methodology for sharing ideas with farmers (1999-2000).

The Rhone Alps region (France) provided funding for the establishment of the eco-museum, the collection of Vietnamese bamboo species, and the development of the conservatory. The Pilat Regional Nature Park shares its expertise on natural resource protection with the people of Phu An. The Sud Expert Plantes Project (SEP) sponsors a contest every two years for the scientific classification of bamboo species in Indochina and the conservation of genetic biodiversity. The American Bamboo Society (US), Royal Botanic Gardens, Kew (UK), the National Museum of Natural History, Paris, and the Pierre-and-Marie-Curie University ("Paris VI", both France) support in the identification of bamboo species.

Support from universities has been essential to the achievement of project objectives. The National University and the University of Sciences ensure the sustainability of the project with their human resources, research programs, and training. The University of Sciences provides support for research on conservation of soil fertility and training in the protection of biodiversity to ensure sustainable development. The University of Chambery trains PhD students in finding new uses for bamboo species. Hoa Sen University participates in the training of youth in social activities. The Bamboo Village also collaborated closely with the University of Agriculture and Forest in Thu Duc during research into bamboo resistance. The University of Grenoble also provided assistance in preparing research projects on composite materials from bamboo.

The staff of Phu An Bamboo Village with the former President of Viet Nam, Nguyễn Minh Triết (standing, eighth from left) in 2011. The President and My Hanh Diep Thi, president of Phu An Bamboo Village, met during the Equator Prize 2010 Award Ceremony held in New York in September 2010, during the UN General Assembly and Millennium Review Summit.
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- Bamboo Village of Phu An website [http://www.ecobambou-phuan.org]

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