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2013



# VARZEA PROJECT:

20 years building a co-management system  
of natural resources in the Lower Amazon

# VARZEA PROJECT

*The Varzea Project, implemented by Ipam between 1994 and 2013 has reached and in some aspects has surpassed the vision of its original objectives. First, the co-management system shared by communities and government implemented in the Santarém varzea and disseminated to Lower Amazon municipalities supports the integrity of the varzea lake system, the typical ecological unit of the Amazon floodplain. Second, it legalizes the mixed property regime traditionally used by local rural residents (ribeirinhos) according to natural resources and their use. Lastly, it integrates in a single legal instrument agreements and other management instruments that regulate natural resource and land management on the varzea.*

*This achievement is the result of a 20-years-long process of construction carried out by Ipam, its partners, and other civil society and government actors, and for which WWF's continued support was crucial. This document highlights core elements of this process.*

## PROJECT LOCATION

Name: Varzea Project  
Location: Santarém,  
Lower Amazon,  
Para state



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# THE CHALLENGE: CO-MANAGEMENT FOR THE MAINTENANCE OF THE ECOSYSTEM'S INTEGRITY

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The Amazon floodplain, or *varzea*, is a diverse landscape that has been inhabited by human populations for thousands of years.

The section of the Amazonas River in Western Pará from the border with the state of Amazonas to the mouth of the Xingu River, known as the Lower Amazon, is characterized by systems of large shallow lakes surrounded by extensive zones of seasonally inundated grasslands that grade into forests which occupy the natural levees bordering the river channels. The annual flood that inundates the *varzea* during several months deposits silt which renovates soil fertility and makes

possible the migration of aquatic fauna between lakes and the river. The *varzea* is a dynamic ecosystem constantly remodeled by the river, which erodes levees in one place only to fill lakes with sediment and form new islands downriver. However, it is also highly resilient, so long as its ecological integrity is not compromised.

From a socioeconomic standpoint, the long annual flood and the high degree of landscape variability demand livelihood strategies that use natural resources from the main landscape habitats over the course of the year: fishing in lakes and river channels; agriculture, small animal husbandry, and extraction of forest products on the levees; and cattle ranching on the grasslands. The diversity and adaptability of *ribeirinho* livelihood strategies have historically sustained their subsistence.

Since the 17th century, *varzea* natural resources have been intensively exploited and the populations of various plant and animal species have been decimated one after the other. Since the mid-20th century, a new phase of exploitation for the first time threatens the ecological integrity of the *varzea* ecosystem. The introduction and expansion of jute cultivation between the 1950s and 1980s led to the deforestation of nearly all Lower Amazon levees. Beginning in the 1970s, the development and expansion of commercial fishing increased pressure on *varzea* lake fisheries, generating conflicts between communities and outside commercial fishers.



A study carried out by a *Varzea* Project researcher in 2004 revealed that the productivity (capture per unit of effort – CPUE) in lakes managed with community fishing agreements was 60% higher than in non-managed lakes.

Finally, the growth of cattle ranching beginning in the 1980s has led to the degradation of natural grasslands and remaining forests, further compromising the *varzea* ecosystem. Concerned with the reduction of fisheries and the degradation of grasslands and forests, communities sought to control access to lake fisheries and negotiated agreements to regulate fishing and ranching in their territories.

Community claims of ownership over lakes faced the additional obstacle of the *varzea*'s land-tenure regime. The *varzea* is considered federal land and private property is not legally recognized. In practice, however, it is divided into private claims and there is a market where these claims are freely purchased and sold, albeit without legal titles. Nonetheless, *varzea*'s legal status impedes the regulation of land occupation and bars residents' access to governmental credit programs and technical assistance.

When the *Varzea* Project began, in 1994, its main objective was to transform community fishing agreements into the basis of a new fisheries co-management policy in which community and government collaborated to manage *varzea* lake fishing.

Also during this phase, the *Varzea* Project worked with communities to manage other *varzea* habitats and resources, such as promoting

**35.000**

In the *Varzea* Project's first 12 years, Ipam and its partners built a co-management system based on intercommunity councils, the Regional Fisheries Councils (CRPs), composed of representatives of all communities that shared the same lake system, the basic unit of the *varzea* ecosystem in the Lower Amazon. Seven CRPs were created, encompassing all the main *varzea* lake systems in Santarém, involving over 35,000 people in 150 communities.

### **Pirarucu (*Arapaima gigas*) adaptive management**

In addition to regulating lake fishing, the *Varzea* Project developed management subprojects for important aquatic species like the pirarucu, turtles, and alligators. Of these initiatives, the most important was the pirarucu community management subproject, using a methodology developed at the Mamirauá Sustainable Development Reserve. Taking advantage of the biological characteristics of the species and fishers' knowledge, teams of fishers were trained to estimate the number of adult and juvenile pirarucu in a given lake. With this information, teams can define annual capture quotas and prepare sustainable management plans. In 2011, 67 fishers worked as certified pirarucu counters in 28 communities and seven pirarucu management plans were being implemented. This system not only permits the recovery of pirarucu stocks but can increase sustainable production by fifteen-fold. Based on this work, Ipam is working with the state fisheries agency to develop policies for the sustainable, community-based management of the pirarucu.

the improvement of agriculture and the restoration of degraded vegetation. The expansion of jute and cattle ranching caused the loss of over half of the *varzea*'s forests and the degradation of the grasslands and remaining forest areas. To address the impacts of habitat degradation on lake fisheries, residents of the community of Aracampina formed the Group Renascer and, with the collaboration of Ipam and the community's environmental education program, reforested the margin of a nearby lake. Within three years, fishers were using the fruits from these trees as bait to fish underneath the forest they had themselves planted. Ipam also supported the initiative of the community of Igarapé do Costa to plant natural grasses along the margins of lakes to form great barriers of floating grasses during the flood that protect their houses from waves during the flood season and provide habitat for fish and other aquatic species.



Within three years, fishers were using the fruits from these trees as bait to fish underneath the forest they had themselves planted.

After 2006, the National Institute for Colonization and Agrarian Reform (Incra) incorporated the co-management system into a new *varzea* settlement policy which transformed community territories into Agroextrative Settlement Projects (PAEs). PAEs resolve the land-tenure problem in areas traditionally occupied by ribeirinhos and legalize the co-management system's instruments of integrated management. In 2013, most settlement and resource use in the Lower Amazon *varzea* are regulated by 45 PAEs in nine municipalities, benefiting 11,305 families.

### Agroextrative Settlement Projects in the Lower Amazon



This system was inconceivable in 1994 when the *Varzea* Project began. Community agreements were not legal and there were no formal community territories. The system was developed through a lengthy process that involved many different interventions and adaptations as the system evolved. The main phases of this process are described below.

# THE PROCESS: BUILDING THE LOWER AMAZON CO- MANAGEMENT SYSTEM

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## **Building the co-management system**

The co-management system was developed in three major phases. In the first phase, until the early 2000s, the focus was on the legalization of the community fishing agreements that had been created in previous years. These agreements had been negotiated among communities that shared the same lake to establish rules regulating fishing. In 1997, a collaboration involving the Santarém Fishers' Union (Colônia dos Pescadores Z-20), the Iara

Project (administered by IBAMA, Brazil's environmental protection agency), and the *Varzea* Project of IPAM drafted a policy and an institutional framework for fisheries co-management in *varzea* lakes. The Maicá Region's fishing agreement was the first to be formalized as a legal instrument, in 1999, quickly followed by others in Santarém. Soon afterwards, Ibama began to train Voluntary Environmental Agents – community members certified to monitor fishing and organize patrols in managed lakes in partnership with Ibama.

The next challenge was the regulation of cattle ranching on the *varzea* grasslands, the second greatest source of conflict on the *varzea*. With support from Ipam, the Federal Public Ministry (Brazil's independent body of public prosecutors), and other organizations, communities negotiated formal agreements with local cattle owners. These Terms of Adjustment of Conduct (TACs) defined rules for raising cattle on the *varzea* and established procedures for compensating farmers and fishers who had sustained losses caused by cattle. This second phase of the process represented another step towards the legalization of ribeirinhos' traditional mixed land-tenure regime. It also expanded community control to the terrestrial component of the *varzea* landscape, integrating levees and grasslands into the co-management system.

In spite of this progress, after 10 years the policies and legal instruments for natural resource management in *varzea* lake systems were still not integrated into a unified policy, nor were they able to manage the lake system as an ecological unit. TACs were valid only for community members who signed them, while government restrictions on the exclusion of outside fishers in fishing agreements and lack of government support for enforcement made these agreements extremely weak instruments. The *Varzea* Project and its partners realized that the ecosystem-based co-management of the *varzea* must also involve the resolution of the ambiguous land-tenure situation of the *varzea*.

In 2000, with the collaboration of *Varzea* Project

*With the regularization of land ownership, PAE residents gained access to Incra's credit programs and technical assistance. Families received R\$ 15,000 from the Housing Credit program and R\$ 3,200 from the Support Credit program. Houses were built using technology for clean water and waste processing, while the Support Credit was used to purchase household appliances, professional gear, transportation equipment, and other production supplies.*

researchers, ProVarzea/Ibama began to assess solutions for the *varzea* land-tenure situation. This led in 2006 to Incra being given responsibility for regularizing *varzea* settlement in a manner that recognizes *ribeirinhos*' traditional rights. In order to fulfill this mandate, Incra adopted the PAE model to regularize traditional communities' territories in the *varzea* and created 45 *varzea* PAEs in nine Lower Amazon municipalities.

In 2008, Incra hired Ipam to work with the residents of 15 *varzea* PAEs to prepare Utilization Plans (PUs) and Settlement Development Plans (PBs/PDAs). Ipam believes that the PAE model has important features that contribute toward the consolidation of the co-management system:

- *It establishes formal community territories and transfers management responsibility to PAE resident associations.*
- *It recognizes individual and collective uses of varzea habitats and is therefore compatible with current patterns of ribeirinho settlement, land use and resource management.*
- *It integrates fishing agreements and TACs into a single management instrument (the PU), which is built collectively by residents and defines rules for land and natural resource use in the PAE.*
- *Incra recognized the exclusive rights of residents over fisheries and other natural resources in the PAE's territory.*
- *The PAE enables resident associations to charge fees for fishing in PAE lakes, creating a mechanism to finance communities' management activities.*
- *Compliance with PU rules is required to maintain residency rights in the PAE.*

## PROJECT'S LESSONS

One of Varzea Project's lessons learned was that one of the greatest barriers to co-management's sustainability is the government's disarticulated and inconsistent participation.

In sum, the *varzea* PAE model consolidated the participatory community-based organizational structure that had already been established, at last constituting a management instrument for the *varzea* ecosystem as a whole.

In turn, Incra became the main governmental actor in the co-management system. Incra's entrance in the system did not eliminate any other agency's presence in the PAEs, especially Ibama and the Public Ministry, and brought new agencies into the system, such as the Technical Assistance and Rural Extension Corporation (Emater). Most of all, Incra's addition created a strong position for the government

*In the PU, communities recognized the product of their long journey and were able to apply their experience to improve the PAE's regulatory instrument.*

in the system, with an organizational mandate to implement and enforce the PAEs' rules. This in turn required Incra to respond to and help solve conflicts based on Utilization Plans (PUs) and Settlement Development Plans (PBs/PDAs).

As a mechanism of land-tenure regularization, the PAE provided a stronger legal solution than previous instruments, reducing the insecurity of traditional ribeirinho land tenure and resource use. PAEs give ribeirinhos control over their territories and natural resources. If the access to rivers as transportation routes remains open, in theory the access to lakes and natural resources inside a PAE's territory is now regulated by the PAE association.

### **Strengthening social management**

One of *Varzea* Project's main areas of intervention was leadership development and institutional strengthening through (a) courses in organizational management, natural resource management, and *varzea* public policy; (b) technical assistance in the same areas; and (c) exchange of experiences with groups in other parts of the Amazon *varzea*. Employing participatory principles that had oriented the Catholic Church's work with the fisher and ribeirinho social movements, the project built individual and organizational capacity for *varzea* management.

A critical differential of the *Varzea* Project was its approach to generating the content for courses and other educational activities. Successive exchanges between researchers and technical staff on the one hand, and ribeirinhos and fishers on the other led to the gradual generation of locally specific knowledge that integrates traditional and scientific understanding. This method also enabled ribeirinhos and scientists to learn from each other through the course of the project. Specific methodologies and educational materials were developed over the years through interactions in workshops, courses, and debates.

This approach was at the core of the increased maturity observed in the performance of community organizations and fisher leader, which progressed from making demands to a proactive approach and finally to the implementation of public policy and management instruments that they had helped to create. From the organizational standpoint, the approach increased the social capital of older representative organizations, especially Z-20, and of newer organizations formed with the project's support, such as community associations and the CRPs.

The *Varzea* Project also promoted professional development, which through 20 years increased the quality of local human capital for *varzea* conservation and sustainable development. One of the consequences was the project's ability to

*"We do not work from a position of ignorance. People are well aware of what they are doing and of the consequences of their actions, but frequently do not have a macro vision: each one does one thing, but what does it mean when 700 families are doing the same thing? [...] They know natural history, but not ecological theory, which offers categories and principles to organize natural history knowledge."*

David "Toby" McGrath,  
Varzea Project  
coordinator, June 2000.

maintain a staff of local professionals with growing capacity and qualifications, which is strongly committed to the project's objectives.



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## TRANSFORMATION OF EDUCATION AND ENVIRONMENTAL AWARENESS

Environmental education was one of the areas that contributed the most to the diffusion of themes related to the varzea and its management, significantly expanding the project's social reach.

The Environmental Education Program's (PEA) staff played a critical role in leadership development and capacity building for co-management and in the development of varzea teachers' ability to include environmental education in their day-to-day teaching activities. Between 1994 and 2012, the PEA contributed to a significant improvement in the quality of education in varzea schools.

**17.742**

By 2004, the PEA had trained 175 teachers in 53 schools in the 4 varzea regions of the municipality of Santarém, directly involving 4,317 students and indirectly 13,250 community residents.

In the first 10 years, the Varzea Project developed an environmental education program designed to be included in the elementary school curriculum of Santarém's varzea schools. The program was based on building teachers' awareness of environmental management, preparing teaching materials, and training them in the use of these materials. Because the program used a method based on Paulo Freire's pedagogy, a legacy from the Catholic Church's Base Education Movement (MEB) of the 1980s, it contributed to improving overall teaching practices. In the development of content, the project integrated principles and categories of physical geography and varzea ecology with the knowledge of natural history of residents and fishers.

By 2004, the PEA had trained 175 teachers in 53 schools in the 4 varzea regions of the municipality of Santarém, directly involving 4,317 students and indirectly 13,250 community residents. The Varzea Project also supported the preparation of teachers participating in the PEA for competitions for permanent positions in the municipal secretary of education and in preparing for college entrance exams, further contributing to their professional development and job security. Moreover, the circulation of PEA-trained teachers within the municipal school system expanded the project's impacts well beyond the varzea region.

With the community schools as its focus, the PEA also sought to diffuse knowledge and environmental awareness within the community. The PEA promoted activities that involved the community as a whole, such as educational campaigns about water quality and managing waste. It also organized the annual Environmental Education Fair, initially with the varzea school community, but progressively including urban schools.



A school of the PAE Tapará received the best score in the municipality's Index of Elementary Educational Development (Ideb) in 2009

### **Edy Lopes**

The presence of educator, animator, and talented illustrator Edy Lopes in PEA's team since its inception until his passing in 2012 was critical for the program's success, both in its educational and awareness building objectives. Above all, Edy developed a visual and language identity for project educational materials that made them accessible and attractive to ribeirinhos and fishers.

Historically a marginal region in the municipal educational system, by the end of the first decade of PEA activities the performance of varzea students had surpassed that of other public school students in Santarém. A school of the PAE Tapará received the best score in the municipality's Index of Elementary Educational Development (Ideb) in 2009, and in 2011 the feat was repeated by a school from the PAE Ituqui.

After 2005, under the leadership of the educator that had led the Varzea Project's school curriculum program for 10 years, the Municipal Secretary for Education created a municipality-wide environmental education program. The program was led by PEA-trained teachers and employed values and methods developed in the varzea schools. With the creation of PAEs, other Lower Amazon municipalities invited Ipam to train secretary of education staff and teachers so they too could integrate environmental education into their school curricula.



# PILLARS FOR SUSTAINABILITY

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The development of mechanisms for conservation and management outside of protected areas faces major challenges to the creation of resilient social and institutional foundations. From the social organization standpoint, it is necessary to

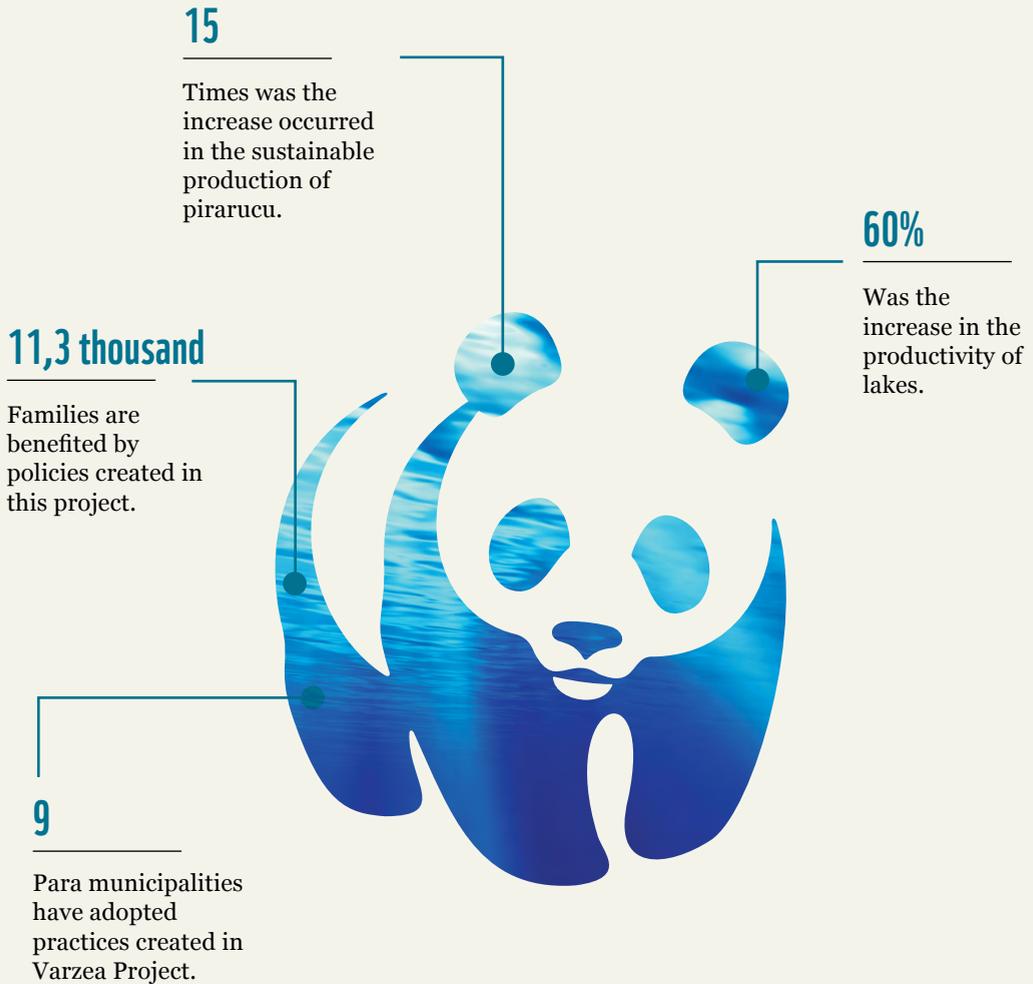
create structures, processes, instruments, and attitudes focused on ecosystem-based management (not only of a single natural resource). In turn, from the public policy standpoint it is necessary to promote the involvement of multiple agencies at different levels of government and, above all, to create institutions that reduce the vulnerability of policies and of the co-management system to party politics.

- *Although the Lower Amazon varzea co-management system still has challenges ahead, in 20 years the Varzea Project/Ipam has achieved results that constitute pillars for sustainability:*
- *It created public policies and instruments that legalize the right of ribeirinhos to control their territory and its natural resources, following parameters that promote the maintenance of varzea's ecosystem integrity.*
- *It formed human capital (local and non-local; technical, scientific, practical, educational, and political) committed to the varzea and the project's greater objectives.*
- *It strengthened social capital in the form of grassroots organizations operating at different levels of social representation (communities, regions, and class) with insertion in the co-management system and in local, regional, and national networks.*
- *It fostered society's knowledge and awareness of the importance of varzea conservation and of traditional ribeirinho lifestyle and rights.*

In a time when financial support for projects has become increasingly focused on short term objectives, this document shows that the profound social and organizational changes behind a sustainable ecosystem-based co-management system outside of protected areas are the result of a process of collective construction whose maturation requires consistent long-term investment of financial and human resources.



# Varzea Project Results



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