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# The Amazon Várzea

The Decade Past and the Decade Ahead



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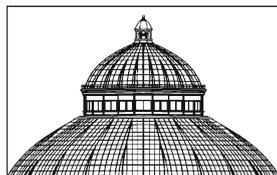
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# The *Várzea*: The Decade Past

Christine Padoch and Angela Steward

## Introduction

In December 1994, almost 12 years to the day before the meeting on *The Várzea: The Decade Past and the Decade Ahead* was convened in Manaus, the first international conference devoted entirely to the topic of the *várzea*, entitled *Diversity, Development, and Conservation of the Amazon Várzea* took place in the city of Macapá. Although the Manaus meeting largely focused on the future, to better understand the path ahead it is instructive to remember where we have passed before. Looking back at the 1994 conference provides a convenient entry point.

In 1994 several ambitious and complex integrated conservation and development efforts in *várzea* environments were underway in both Brazil and Peru: the most prominent of these were at located in Mamirauá (at that time it was the Mamirauá Ecological Station; the Mamirauá Sustainable Development Reserve was not created until 1996), and in the Pacaya-Samiria National Reserve in Peru. There were as well a number of large and important research efforts focused on *várzea* issues that brought teams of prominent researchers to leading Amazonian research institutions, such as the Museu Paraense Emilio Goeldi in Belém, INPA (Instituto Nacional de Pesquisas da Amazônia) in Manaus, and to IIAP in Iquitos. In addition, several smaller but no less active efforts that featured various combinations of research, training, conservation, outreach, and education focused on communities and their fishing and farming, fauna, forests, and agroforests in and around Macapá, Belém, Santarém, Marajó, Manaus, Tefé, and up into Peru around Iquitos and elsewhere. The Macapá conference was convened in response to these efforts, major and minor, in the *várzea*. It provided an opportunity to assess the progress of these projects as well as more generally to evaluate the state of *várzea* research, conservation, and development. For the community of *várzea* researchers it was a chance to meet, exchange ideas, rethink approaches, and form new collaborations, as well as to reach out to the general public, the press, and policymakers. The broader objective of the event was to focus attention on *várzea* environments and communities that were substantially different from those of the *terra firme* that were, and still are, attracting a good deal of the world's attention at the time.

Reflecting the work of many *várzea* researchers of the time, an overarching theme of the 1994 meeting was the prevalence and importance of heterogeneity in the *várzea*: social, physical, as well as biological, and the implications of this diversity for research and management and for effective policy making. Linked to the heterogeneity issue was a discussion of scale, both spatial and temporal, including appropriate scales for management, conservation, and control over resources on the *várzea*. In some cases this took the form of discussions of community versus state control, common property, and open access. Related also to these issues was a strong emphasis on the necessity for crossing disciplinary and/or sectoral boundaries to achieve more effective management as well as more relevant research. Another common theme was the “anthropogenic Amazon,” especially the “anthropogenic *várzea*,” i.e., a strong emphasis on the role of people and Amazonian societies in transforming and enriching *várzea* landscapes. And finally, again reflecting the needs of the integrated conservation and development projects and other *várzea* research and conservation efforts, the many ways and many levels on which links needed to be forged between research, management, conservation, and policy making was a prominent and common concern at the meeting.

Each of these five cross-cutting issues was broadly applied to consideration of the more specific topics: fisheries, forestry, conservation, soils and river dynamics, and the management of land resources. These topics were the five headings under which presentations at the meeting, and later the book that resulted from the conference, were organized. The volume entitled *Várzea: Diversity, Development, and Conservation of Amazonia's Whitewater Floodplain* brought together most of the presentations and discussions of the Macapá meeting and now offers a window into what were the major foci of research and conservation efforts of that time. Many, if not all, of these issues stand out as continuing concerns of research, conservation, and development in *várzea* environments. In hindsight, a number of important issues were either underrepresented or ignored at the time of the planning and/or implementation of the Macapá meeting in 1994, as well as in the resulting volume, again largely reflecting contemporary research emphases. Gaps that particularly stand out include:

1. Demographic shifts in the *várzea*, especially urbanward, and circular rural-urban flows, which in 1994 – as now – were very important trends. These and other demographic and economic and policy changes, especially the importance of new sources of income for families living in the floodplains and/or exploiting *várzea* resources, did not receive the attention they merited at the Macapá meeting.
2. Common property management of resources figured in discussions of fisheries, but little was featured on the peculiarities, complexities, and change in land tenure in the *várzea* and their effects on the use of resources and the fate of communities.
3. Areal coverage of the basin was quite uneven. Upriver areas, other than the Pacaya-Samiria Reserve, were little discussed, and little was said about *várzea* areas in countries other than Brazil and Peru. Then as now there were very important changes occurring in some of these highly dynamic regions. Immigration flows, land use changes, as well as intensification of the exploitation of timber, fish, and other resources in these neglected regions demand attention.

The years following 1994 have been characterized by great changes in the Amazon *várzea*. Advances in *várzea* research, conservation, and development, and the impacts of broad social, economic, and political forces have added to the understanding and appreciation of the complexity and heterogeneity of *várzea* environments and cultures. Here we provide a very brief outline of several of these major changes and their implications for future conservation and development and research initiatives in the Amazon *várzea*. The discussion is not meant to be a comprehensive review, but rather provides a lens through which the case studies in this book can be read. We review several of the broad political, social, and economic processes that have prevailed in the Peruvian and Brazilian *várzea* over the last decade. Some of these are discussed in far greater depth in the chapters that follow; many are only now being examined comprehensively by researchers.

## Social, Political, and Economic Changes

### *Brazilian Várzea*

Over the past decade numerous national-level political shifts and policy reforms have changed the Brazilian Amazon, bringing both new opportunities and challenges to *várzea* communities. The first of these changes was the decentralization of the Brazilian government. Under government restructuring policies following 1988, the northern Amazonian territories, including Amapá and Roraima, which once fell under the jurisdiction of the federal Brazilian government, were made member states of the federation. With this change, judicial power and financial resources were distributed to state and municipal governments (Kingstone 1999; Souza 1997). In many ex-federal territories, reorganization resulted in the creation of state school and health posts in many *várzea* communities. This change also created rural public sector jobs that resulted in improved public services in many rural areas (IBGE 2007). At the same time, however, decentralization has meant that administration of rural extension and development programs now falls under the jurisdiction of young state governments. To date, *várzea* farmers in ex-federal territories report the weakening of extension services and rural development programs following this shift. In Amapá, rural extension agents explain that limited funding and lack of trained personnel have made it difficult for the young states with limited financial resources to deliver adequate services in rural areas. Local development agencies in states like Amapá continue to suffer from difficulties such as geographic isolation and high transportation costs (RURAP 2004).

Decentralization has also coincided with the emergence of new social movements and networks in the *várzea*. One of the most important events has been the establishment of local chapters of the national rural workers unions (*Sindicato dos Trabalhadores Rurais*) in new *várzea* communities. Throughout Amazonia, union leaders have informed farmers of their rights to retirement, disability, and widows' pensions offered through the *Instituto Nacional do Seguro Social* (INSS),

Brazil's social security institution. In regions where the union movement has been strong, the effect has been to bring stable monthly incomes to retired and aged *várzea* residents (women, 55 and men, 60), whose livelihoods depend on natural resource management (Schwarzer 2000). Research results from the Brazilian Amazon estuary, in the municipality of Mazagão in Amapá, indicate that the rural pension program has increased economic security as well as community perceptions of well-being, and represents today the most secure source of income for a significant portion of rural *várzea* households (Steward 2008).

Several national campaigns aimed at alleviating poverty in Brazil's poorest regions have also brought benefits to many *várzea* communities. National social welfare programs, such as the *Bolsa Escola* and later *Bolsa Família* programs, offer stipends to poor families with school-age children (Rawlings 2005). These federal initiatives have been widely implemented across the country and have reached rural *várzea* communities – in particular those located close to regional cities (Steward 2007). Federal social welfare programs have additionally been supplemented by state and municipal programs also offering cash assistance to poor families. Research from the estuary of Brazil has shown that two communities (87 households) were receiving income from eight different social welfare programs (Padoch et al. 2008; Steward 2008).

The three changes outlined above – decentralization and public job creation, the establishment of a rural pension program, and new social welfare policies – have brought new sources of income to *várzea* communities. In contrast to wages earned from the sale of forest and agricultural products, wages, pensions, and welfare payments are earned on a monthly basis. While little research has been conducted on the effect of these programs on patterns of resource management and biodiversity in the *várzea*, preliminary studies from the Amazon estuary indicate that these programs have had significant impacts. In the state of Amapá, research shows that many farmers invest retirement pensions in their properties to increase the economic productivity of the household forests, fallows, and house gardens in their landholdings (Steward 2008; Padoch et al. 2008). Research has also shown that because families earn cash on a more regular basis, many have given up the production of subsistence crops such as corn, beans, and manioc in annual fields, and are purchasing cheap staples such as manioc flour and rice imported from southerly states in Brazil to sustain their families. At the same time, farmers are increasingly orienting their productive activities toward crops such as açai and fruit crops with a strong local market. While fish and game are still common protein sources in these study communities, income from government sources is increasingly used to purchase chicken and beef in greater quantities to meet household food needs (Steward 2008).

Two additional changes have fostered positive social and economic transformation in *várzea* communities across Brazil. Along with forming local chapters of the rural workers union, in many *várzea* communities residents have created community organizations, such as women's associations, farmers' associations, and residents' associations – many of which are recognized in Brazil as grassroots organizations (McGrath 2000). Formation of these civic groups has allowed many rural isolated *várzea* communities to gain visibility and support from national and

international NGOs and government organizations. With NGO status, community groups can apply for funds for community projects to support rural development. While the goals of these diverse groups vary greatly, most aim to improve health and education services and promote economic development. Community-level organizing has thus rendered previously isolated *várzea* communities visible on a regional, national, and often international scale. This shift represents another way in which the *várzea* has become further integrated into a global political and economic system (Almeida 2002).

A final change fostering rural development has been state and federal programs aimed at electrifying vast rural areas across Brazil. In 2004, the Lula government established a national program entitled *Luz Para Todos* (Light for All), with the ambitious goal of bring electricity to all rural areas in Brazil. Following the federal government's initiative, state governments have also launched rural electrification programs. In the state of Amapá, the state-funded *Luz para viver melhor* (Light to Live Better) has brought electricity to *várzea* communities in close proximity to urban centers. Electrification in these areas has brought immediate benefits to *várzea* dwellers. Residents are able to store perishable foods and thus economize on household labor. In addition, electricity provides the potential for new means of post-harvest food processing and finishing. With electrification, many *várzea* residents began to conserve frozen fruit pulp to sell in the off-season and thus earn a higher price per unit (Steward 2008). Improved communications have also facilitated community organization efforts. With access to information regarding market prices of forest and agricultural products, farmers are no longer at the mercy of middlemen who in some *várzea* areas have historically underpaid farmers for their products. While these important advances have been made in Amapá, most *várzea* communities in areas such as the Amazon estuary remain to be reached and serviced with rural electrification programs.

The Brazilian government launched a national agrarian land reform policy in the early 1970s (Kay 2000, 2007). Information regarding new land tenure laws has been slow to reach *várzea* communities. Over the last decade, union and community leaders have brought this information to rural communities. Because of this influence, a larger number of *várzea* households have been able to obtain legal tenure. In addition, some communities have opted to secure "communal" and household land rights. Over the last decade a large number of conservation units have also been created by the state and federal government. While the aims of these conservation units vary, most are based on the premise of forging sustainable development in *várzea* communities through the careful management of *várzea* resources.

The above changes – land reform and distribution, community management, and the creation of new conservation units – illustrate that today more than ever the tenure situation in the Brazilian *várzea* is increasingly complex. In some areas of the *várzea*, a formal and legible land tenure system is in place, where independent farmers own titles to their properties. In other cases, communities manage resources together, defining the terms of their use locally, and are the legal occupants of these spaces. This complex and heterogeneous land tenure situation needs to be carefully considered in future conservation and development initiatives in the Brazilian *várzea*.

## *Peruvian Várzea*

Broad social, economic, and political forces have also had impacts on the Peruvian *várzea*. The recent history of Peru, from the mid-1980s through the mid-1990s, has been fraught with violence attributed to the guerilla movement known as Shining Path (*Sendero Luminoso*) and drug traffic and production (Kay 1996–97, 1999; Kuner 1997). While guerilla violence was concentrated in the highlands, and in particular in the Huallaga Valley, stretching over the Departments of Huánuco and San Martín, acts of violence and sabotage spread into neighboring departments of Ucayali and Loreto in the central lowland Amazon, causing disruption in *várzea* peasant communities along the Ucayali, Huallaga, and Marañón rivers. Over the last decade, drug traffickers have continued to transport large quantities of cocaine along the tributaries of the Marañón and Ucayali Rivers, through an array of Amazon routes across the Brazilian and Colombian borders (Kay 1999).

Violence attributed both to the illicit cocaine trade and to the Shining Path movement has had a significant impact on the livelihoods of rural people living in several *várzea* regions. Violence and the threat of violence spurred migration, causing villagers to seek refuge in other communities and cities in several parts of the Ucayali and Loreto regions. The violence created by Shining Path and drug trafficking, as well as repression of these problems, has impeded the evolution of civil society organizations in the *várzea*. Incipient rural organizations were destroyed and the instability and uncertainty have made it difficult for communities to form farmers' unions, associations, and cooperatives.

When Alberto Fujimori was elected president in 1990, his government implemented a series of neoliberal economic reforms. As in Brazil, the policies called for economic austerity and decentralization. One great consequence of Fujimori's economic policies in the *várzea* was the demolition of the state Agrarian Banks, which since the 1960s had provided subsidies and credits to smallholder *várzea* farmers (Chibnik 1994). Research conducted in *várzea* communities near the city of Iquitos has illustrated that the loss of these state programs prompted shifts in natural resource management in *ribereño* peasant communities (Acre-Nazario 2007; Pinedo-Vasquez et al. 2002). Acre-Nazario (2007) shows that following the loss of agricultural credits and subsidies, *ribereños* shifted from agriculture to charcoal production. With the loss of subsidies for agricultural production, charcoal production became more viable because it required little monetary investment. Growing local urban demands for charcoal as a cheap cooking fuel also made the activity relatively risk-free (Acre-Nazario 2007). Furthermore, and in a similar vein, Pinedo-Vasquez et al. (2002) have shown that in the greater regions of Ucayali and Loreto, farmers who once planted rice and benefited from the Agrarian Bank's credit programs now largely depend on the sale of fish in growing urban markets to earn cash income. In contrast to Brazil, the loss of supports for farmers in Peru has not coincided with new social programs to alleviate poverty and redistribute income, and thus *ribereños* and indigenous farmers in the *várzea* of Peru have remained marginalized within the nation state.

One of the most significant policy changes affecting the Peruvian *várzea* was the promulgation of new federal legislation guiding the use, management, and conservation of forest resources (Hidalgo and Chirinos 2005). The new law that came into effect in 2001 was born of a participatory process that involved discussions and debates among 15 working groups of individuals representing forest producers, government agencies, environmental nongovernmental organizations, industrialists, Amazonian native communities, and other relevant groups (ITTO 2003). The main goal of the new forestry law was to promote effective forest management through decentralized governance and oversight of forestry operations. Another goal was to increase the economic contribution of the forestry sector to the national economy. Under the new law, forests in Peru have been divided into various forest types, including production forests, forests on protected lands, forests for future utilization, community forests, and local forests. Specific land use categories are associated with each forest type; various stakeholders gain access to forest resources through concessions, permits, and official authorizations (IRENA 2003). The legislation also provided a legal framework for promoting forest certification and attempted to promote sustainable forest harvesting through long-term concessions within permanent production forests.

The legislation recognizes the multiple users of forest resources and attempts to implement a participatory and decentralized approach at governing those resources. Research has shown, however, that in practice the legislation has increased unsustainable and predatory harvesting of timber in Peru. In particular, small-scale loggers who often do not have the political power nor the financial resources to win bids for long-term concessions have turned to illegal and informal logging, often on the peripheries of legally sanctioned areas (Higaldo et al. 2005). Small-scale loggers working informally generally supply timber to growing regional cities, where demand for cheap timber has increased over the past decade. Experts have thus shown that despite the new regulations from 1999 to 2005, new forest disturbances and deforestation in the Peruvian Amazon occurred at a rate of 632 square kilometers per year and 645 square kilometers per year, respectively (Oliveira et al. 2007). Deforestation data published by government agencies indicate that 86% of all forest damage was concentrated in two regions: the Ucayali logging center of Pucallpa and along the road network that emanates from this area (INRENA 2003). In addition, 75% of new logging occurred within 20 km of legally sanctioned areas in Peru. For instance, in the central Pucallpa region, deforestation and disturbance had increased by 400% over the course of these six years (Oliveira et al. 2007).

In the face of socioeconomic marginalization, *ribereños*, who are the majority population of the Peruvian *várzea*, have become economically dependent on fish, timber, and other natural resources to make a living. As a result, forests and lakes in the Peruvian *várzea* are rapidly becoming degraded. Several lakes that were the source of fish and other food sources for *ribereños* are currently polluted and depleted. Similarly, forests located at the back of the communities, which have long provided safety nets for many *várzea* dwellers, have been lost or degraded over the last decade. The depletion and degradation of natural resources, in particular the loss of fish, game, and timber stocks, are among the drivers of migration, propelling *ribereños* to urban centers, particularly Iquitos and Pucallpa.

## **Urbanization Processes and Rural Production, Peru and Brazil**

The above changes have occurred against a backdrop of accelerated urbanization in Amazonia. Researchers now estimate that over 70% of all Amazonian residents live in urban centers, either in the region's historical port cities, or in new urban centers that have grown up within the last 20 years (IBGE 2007). Most of the large cities in the region, including Belém, Manaus, Santarém, Macapá, Iquitos, and Pucallpa, are situated in or at the edge of the *várzea*. The growth of regional cities is attributed to various factors, including the expansion of the public sector, state-sponsored colonization projects in both the Peruvian and Brazilian Amazon, capitalist development projects, processes of deagrarianization in the rural areas of Amazonia due to the challenges of production in an increasingly integrated and global society, the continuing lack of educational and other services in rural areas, and the growth of informal sectors in regional cities offering opportunities for urban employment (Browder and Godfrey 1997; Brondízio et al. 2002; Brondízio 2008; Padoch et al. 2008).

The effects of city growth on rural and urban *várzea* environments are now being explored (WinklerPrins 2002; WinklerPrins and deSouza 2005); one impact appears to be the creation of growing urban markets for *várzea* products (Brondízio 2002, 2008; Padoch et al. 2008). In the Amazon estuary, for instance, *ribeirinho* producers have responded dramatically to the increased demand for açai fruits, which are required in large quantities to meet the needs of a growing low-income urban population in regional cities and booming external markets (Brondízio 2008). In Peruvian Amazonia, the growth of shantytowns has given rise to burgeoning markets for inexpensive timbers such as capirona, a *várzea* species which is increasingly dominating managed secondary forests and fallows. Growth of *várzea* cities is increasingly accompanied by significant rises in pollutants in rivers, with a negative impact on the health of both people and wildlife in the region (Pineda 2005).

## **Advances in Research, Conservation, and Development: Pro*Várzea***

The major *várzea* research and conservation projects, Mamirauá and Pacaya-Samiria, whose creation inspired the first *várzea* conference, are still generating important research, insights, and conservation experience in the *várzeas* of Brazil and Peru. Some of these advances are discussed in the papers that follow. During the past decade many other long-term and new efforts have focused on the floodplains; several are also presented, discussed, and dissected in this volume. The foremost governmental and nongovernmental research institutions have focused on Amazonia, including the Museu Goeldi, INPA, IIAP in Peru, IPAM, and IMAZON, as well as the universities of the Amazon Basin, including the Núcleo de Altos

Estudos Amazônicos at UFPA. They have also fielded a great variety of projects and programs on the *várzea* (de Casto and McGrath 2003). The most significant new institution dedicated entirely to *várzea* research, conservation, and development over the last 12 years has been the ProVárzea program launched by the Brazilian government in 2001 (ProVárzea 2007). ProVárzea is a federal government initiative funded through the Program for the Conservation of Brazil's Tropical Forests (PPG-7) and executed through IBAMA, Brazil's environmental regulatory agency. The objectives of ProVárzea combine research in *várzea* environments, sustainable development through novel approaches to natural resources management, and a decentralized, participatory approach to monitoring the use of *várzea* resources, which complements IBAMA's efforts to uphold federal environmental laws and regulations in the *várzea*. The work and many of the accomplishments of ProVárzea are detailed in contributions to this volume.

## Conclusion

Many of the changes to *várzea* environments and societies that we mention above, and many more that we have failed to point out, are the subjects of the articles, section introductions, and commentaries that follow. Some of the sections of the present volume recall the organization of the first *várzea* volume, *Diversity, Development, and Conservation of the Amazon Várzea*. The present book features chapters on the management and conservation of aquatic resources and of terrestrial resources, as well as a section on conservation and conservation units. Forestry and fluvial dynamics receive somewhat less emphasis in this book than in the first, although each topic gets some attention in a number of papers. Several of the important issues that were left unexamined in the earlier volume, however, are at least partially scrutinized and discussed here, including several examinations of demographic change and urbanization, as well as major assessments of tenure and resource rights in the *várzea*.

The contributions collected in this book are one more step in the exploration of complexity and heterogeneity of *várzea* environments and peoples in an era of great change. It is our hope that this book will inspire additional research in both the natural and social sciences from an array of perspectives and approaches, and that this information, and in particular the lessons learned from previous endeavors in conservation and development, will help inform effective policy for the Amazon *várzea*. The tireless dedication of many of the contributors to this volume to conservation and development – along with the positive movements toward sustainable development outlined in this review – leave us with an optimistic view of the future of the Amazon *várzea* as we approach the next decade.

We insist on optimism despite the fact that during this past decade the *várzea* lost its greatest champion: the great scholar and conservationist, and our friend, J. Márcio Ayres. This volume includes a special section in honor of Márcio and his work, and we dedicate this book to him.

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# **Várzea: The Decade Past and the Decade Ahead – An Introduction**

**Muriel Saragoussi**

Over the last several years, the Ministry of the Environment of Brazil has been working tirelessly to give sustainable development policy in Amazonia the visibility and importance it deserves. In the Amazon region, as in the halls of the federal government, it is recognized that Amazonia, more than any other part of Brazil, is home to the knowledge and experience necessary to show that concern for the environment and economic development are not only compatible, but go hand-in-hand in creating a better world.

We have, therefore, instituted the Sustainable Amazonia Plan (PAS) as a regional framework that recognizes the social, cultural, and ecological diversity of the region, as well as its varied histories of settlement and economic uses in order to offer – in a form that integrates all of Amazonia’s diversity – development that is socially, environmentally, economically, culturally, and politically sustainable.

The concept we employ now in our public policies is that the process of policy creation and negotiation is as important a product as the final policy result. This product – whether a law, a program for public financing, the creation of a conservation unit, or other – cannot be disassociated from the process of its creation. In other words, it is important to understand who were the actors who were involved in elaboration of the proposal; what, if any, were the most important conflicts that were encountered; how an accord was finally reached; what perspectives and whose interests predominated throughout the process; and what was the final outcome. The quality of the process is essential to the quality and the other basic features of the final product, as well as to the probability of effectively implementing the specific policy.

Thus, public consultation, transparency, and social involvement have been the central tenets of our work. To recall, the four objectives the Ministry of Environment strives to achieve are: an environmental policy integrated with other government priorities; sustainable development; social participation and involvement; and the strengthening of SISNAMA, the National Environment System.

Thanks to the conscientious implementation of these objectives, at the end of 2006 we could report that deforestation in the Amazon decreased by 52% in 2 years (31% in 2004–2005 and another 30% in 2005–2006), and that 19.4 million ha of federal units of conservation were created in the areas of greatest conflict, illegal “land grabbing,” and deforestation. Following in these directions, INCRA prevented

66,000 registrations of irregular rural properties that would have resulted in further illegal grabbing of public lands, and the Law of Management of Public Forests and the Limitation of Provisional Administration Instrument (ALAP) were approved for areas where critical studies are needed for the creation of conservation units.

I will not cite all of the victories or all of the progress that this vision of integrated process and policies has brought the country; but they, together with the fight against corruption and crimes associated with environmental offenses, have built a solid base upon which we can put sustainable development into practice in Amazonia.

The greatest challenges today concern how to add value to sustainably produced forest products, and how to create just relationships between those who produce and those who buy these products, and how to do all this on a scale that will be compatible with improving the quality of life of Amazonians while maintaining all ecosystem functions. To rise to these challenges in the Amazon *várzea* we need to integrate traditional knowledge on resource use and management with the body of scientific knowledge that has been generated over the last 2 decades. With these we can create effective and lawful patterns of use and management.

While we will not list all of the projects and processes supported by the Ministry of the Environment, we would like to focus attention on some of the excellent results of the ProVárzea program. The point of departure for ProVárzea is the notion that sustainable and effective public policies can arise only if all stakeholders participate in the design of these solutions. In Amazonia it is necessary to involve not only the actors representing the state, civil society, and science, but also the economically powerful, who often consider participation merely a waste of time, but nevertheless are accustomed to having privileged access to power.

ProVárzea has demonstrated both understanding and commitment to involving all stakeholder groups, including those representing the government and nongovernmental organizations, the beneficiaries, as well as the direct and indirect users, in all its presentations and discussions of the results of the studies they have supported.

Without doubt the greatest advances that have been made are in the area of cross-cutting opportunities that link environmental policies to other policies affecting the Amazon *várzea*, especially those that further:

- Legalization of land tenure in *várzea* areas regulated by SPU, INCRA, and IBAMA, the norms and procedures having been established and processes initiated in the states of Amazonas and Pará,
- Identification of priority areas for the conservation of *várzea* biodiversity by making them available to the ARPA Project as well as to CNPT by subsidizing the implementation of future conservation units, and
- Support to IBAMA in the regulation of fishing of large migratory catfish and other species of commercial value.

In policies and legislation related to community management, participatory and community management as a tool for regulating fishing in the Amazon Basin has been strengthened. This new direction has led to the training of more than 400

people, including environmental analysts for IBAMA, state environmental organizations, NGOs, and community leaders.

The principal limitation to implementing this model is the organizational capacity of the groups involved, rather than their technical capacity. It is known that groups with a strong social base will be better equipped to resolve any technical questions. The challenge is to strengthen the ability of communities to organize and create the necessary conditions for sustained collective action. For this reason, ProVárzea has promoted organizational development using diverse strategies, but principally through the support and promotion of projects that act as catalysts of change in their regions and that generate methods and lessons that then can be replicated in other areas and regions.

In total there have been 25 subprojects supported by ProVárzea, with resources on the order of R\$10 million. These have included projects on capacity building, resource management, sanitation, and product marketing. Some of the outstanding illustrations of program outputs and impacts include the following:

- In total, 115,486 people were directly affected in 32 municipalities of the states of Amazonas and Pará by ProVárzea-supported projects.
- About 100,266 ha of area in terrestrial and aquatic ecosystems are now under management. A significant portion of the managed aquatic sites employ official “Normative Instructions” in regulating community fishing accords.
- In relation to the process of supporting associations or cooperatives, new institutions were created based on ProVárzea projects and their partnerships, including one on the river São Francisco that resulted from the dissemination of a project carried out by the MOPEBAM (the Fishermen’s Movement of Eastern Pará and Lower Amazonas).
- Fishermen’s unions were strengthened by increasing their economic activities and promoting their important social and political achievements. It is worth mentioning that four town councilors who were elected came from the ranks of directors of the fishermen’s unions of Santarém (Z-20), Juruti (Z-42), Prainha (Z-31), and Óbidos (Z-19), as did a State Secretary of Fisheries and 12 municipal health councilors.
- There was a 32% increase in the number of women occupying directors’ positions in community associations supported by ProVárzea.
- One hundred and fifty six training courses were offered by projects, on subjects ranging from regional cooking for cooperative and community members, to environmental legislation, distillation and extraction of essential oils, management of lakes, and the implementation of demonstration sites for forest timber management, reaching a total of about 2,300 people.
- New management techniques were developed and improved, focused on the management and marketing of freshwater shrimp (*Macrobrachium amazonicum*); the management of stingless bees in Amazonia, (*Mellipona* spp); the extraction, processing, and marketing of essential oils of várzea species, such as *cumaru*, rosewood, *andiroba*, and *copaiba* – in total ten new products reached markets, generating income for local residents and communities.

Beyond supporting projects, ProVárzea tested several new models of shared management of natural resources in the *várzea* with excellent results. These included an interinstitutional monitoring system known as the Integrated Unit of Environmental Defense (UNIDA), created in Santarém in Pará State, but now being replicated in other municipalities in eastern Pará; another is the institutionalization of the Environmental Volunteers Program for IBAMA using lessons learned from ProVárzea projects, and the creation and strengthening of Municipal Councils for Rural Sustainable Development with the implementation of Municipal Rural Sustainable Development Plans.

In conclusion, it is clear that the macropolicies for Amazonia proposed and implemented by the Ministry of the Environment are solidly anchored in experiences developed by local socioenvironmental institutions and their partners. The Pilot Program for Tropical Forests (PPG-7) was one of the seeds of the Sustainable Amazon Development Plan. This advance in turn will be “fertilized” by the Amazonia Program which we are now designing to replace the Pilot Program for the ever-changing ecosystem of Amazonia.

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# Abbreviations

## Preface

ALAP	Limitation of Provisional Administration Instrument
INPA	Instituto Nacional de Pesquisas da Amazônia
INSS	Instituto Nacional do Seguro Social
MOPEBAM	Fishermen's Movement Eastern Para and Lower Amazonas
PAS	The Sustainable Amazonia Plan
PPG7	Pilot Program for Tropical Forests
SISNAMA	Brazilian National Environment System
UNIDA	Unit of Environmental Defense

## Chapter 2

BMI	Body Mass Index
HIV	Human Immunodeficiency Virus
PID	Pelvic Inflammatory Disease
PSA	Health and Happiness Project
SES	Socioeconomic Status
STI	Sexually Transmitted Infection

## Chapter 4

ACAR	Association of Credit and Rural Extension
ICMS	Municipal Sales Tax
IDAM	Institute of Development of Amazonia
INCRA	National Institute of Colonization and Agrarian Reform
EMATER	Corporation for Technical Assistance and Rural Extension
EMBRAPA	Brazilian Agricultural Research Corporation
FUNRURAL	National Fund for Rural Assistance
ITERAM	Land Institute of Amazonia
PND	National Program of Development
SPVA	Superintendency of the Economic Recovery Plan for the Amazon
SESP	Special Public Health Service
SUDAM	Superintendency for Amazonian Development
ZFM	Manaus Free-Trade Zone

## Chapter 5

IBAMA	Brazilian Institute of Environment and Renewable Natural Resources
MMA	Ministry of the Environment
PAE	Agroextractive Settlement Projects
SPU	Federal Patrimony Services

## Chapter 6

PIN	National Integration Plan
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## Chapter 8

CPUE	Catch Per Unit Effort
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## Chapter 9

GRPU	Gerência Regional do Patrimônio da União
PDS	Projetos de Desenvolvimento Sustentável
VEA	Voluntary Environmental Agents
TAC	Terms of Adjustment of Conduct

## Chapter 10

MAPA	Ministry of Agriculture, Livestock and Food Supply
RAN	National Center for Conservation and Management of Amphibians and Reptiles
RDS	Sustainable Development Reserves
RESEX	Extractive Reserves
SNUC	National System of Conservation Units

## Chapter 11

AVV	Voluntary Environmental Agent program
CBD	Convention on Biological Diversity
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
COPESCAL	Commission for Inland Fisheries of Latin America
CPUE	Calculation of Productivity per Unit of Effort
EIA	Environmental Impact Assessment
GTZ	German Technical Cooperation Agency
IPAAM	Amazon Environmental Protection Institute
IPAM	Research Institute of Amazon
MPR	Management Plan for the Reserve
SCM	Mamirauá Civil Society
TCA	Amazon Cooperative Treaty

## Chapter 13

DBH	Diameter at Breast Height
NMDS	Non-Metric Dimensional Scaling

## Chapter 16

ALAP	Area of Provisional Administrative Limitation
APA	Environmental Protection Area
EIA/RIMA	Environmental Impact Study
IAG	International Advisory Group
NTFP	Non-Timber Forest Products
PAC	Program for Acceleration of Growth
SDS	Secretariat of Sustainable Development

## Chapter 17

ASDR	Amanã Sustainable Development Reserve
MSDR	Mamirauá Sustainable Development Reserve
SDR	Sustainable Development Reserves

## Chapter 19

CNS	The Rubber Tappers' National Council
CNTP	National Center for the Sustained Development of Traditional Populations

## Chapter 20

EXRES	Extractivists Reserves
PA	Protected Area

## Chapter 21

CNPq	National Council for Scientific and Technological Development
IDSM	Mamirauá Institute of Sustainable Development
MCT	Ministry of Science and Technology

## Chapter 22

SEMA	Environment Secretary
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## Chapter 23

IBDF	Instituto Brasileiro de Desenvolvimento Florestal
ODA	British Overseas Development Agency
SCM	Sociedade Civil Mamirauá
WCS	Wildlife Conservation Society

## Chapter 25

CGBA	Comitê de Gestão do Uso Sustentável dos Recursos Pesqueiros da Bacia Amazônica
FASE	Federation for Social and Educational Assistance
UNIDA	Integrated Environmental Defense Unit