

Dramas of the Commons in Brazil*

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Recebido em 03.12.2012
Aceito em 03.01.2013

RESULTADO DE PESQUISA

Abstract

This article examines experiences with commons, both tragic and successful, in local communities in Brazil. The problem for collectors is not limited to land, but also includes their access to natural resources outside their territories. Use rights could be established, regulating wild collection on land of third parties or government. Access to such commons should be limited to members of specific groups through private agreements regulated by official norms. Conclusions and recommendations for research and policy include, among others: 1) priority or communities under the greatest pressure, 2) land reform which provides for access to natural resources outside individual lots, 3) regulation of sustainable use in various kinds of protected and reserved areas, 4) inclusion of families with off-farm activity and multiple residence. Sustainable productive landscapes are the only way to achieve the scale necessary to maintain ecosystem functions of aquatic resources, biodiversity and carbon ("ABC").

Key words: commons, Brazil, Cerrado, small grants, biodiversity, sustainable development.

Resumo

Este artigo analisa experiências com comuns, trágicas e bem sucedidas, em comunidades locais no Brasil. O problema para os agroextrativistas não se limita à terra, mas também inclui o acesso a recursos naturais fora de seus territórios. Direitos de uso poderiam ser estabelecidos, regulando o extrativismo em terras públicas ou de terceiros. O acesso a esses comuns deve ser limitado aos membros de grupos específicos, por meio de acordos privados regulados por normas oficiais. Conclusões e recomendações para pesquisas e políticas públicas incluem, entre outras: 1) prioridade para comunidades sob a maior pressão, 2) reforma agrária que contemple o acesso a recursos naturais fora dos lotes individuais, 3) a regulamentação do uso sustentável em vários tipos de áreas protegidas e reservadas, 4) inclusão de famílias com atividade não-agrícola e residências múltiplas. Paisagens produtivas sustentáveis são a única maneira de alcançar a escala necessária para manter as funções ecossistêmicas de água, biodiversidade e carbono ("ABC").

Palavras chave: comuns, Brasil, Cerrado, pequenos projetos,

INTRODUCTION

This article examines a wide range of experiences with commons, both tragic and successful, in local communities in Brazil. The geographical focus is the woodland-savanna known as *Cerrado* (Scariot et al. 2005). The main source of information is the experience with projects funded over the last 18 years by the *Programa de Pequenos Projetos Ecosociais* (PPP-ECOS), managed by the Institute for Society, Population and Nature (ISPN) with support from the Small Grants Program (SGP) of the Global Environment Facility (GEF) and the United Nations Development Program (UNDP). The program in Brazil is described by Nogueira (2005), Sawyer (2005), ISPN (2006) and Lobo et al. (2010). The article also uses published and unpublished literature and information about experiences in other parts of the country. Based on the review, it presents some conclusions as well as various recommendations for research and policy.

TRAGEDY AND COMEDY OF THE COMMONS

Hardin (1968), in one of the most cited articles in scientific history, raised the issue of the “tragedy of the commons,” proposing that the absence of private property leads to environmental degradation because of individual greed. He based his analysis on the radical individualistic assumption that people always seek to maximize their own interest without any collective interest or in outright opposition (1974). That neo-classical starting point in rational choice theory is not widely accepted as a realistic assumption about human behavior (Drummond 1990; Sen 2010) and its misuse has even been considered “pathological” (Green and Shapiro 1994). It is not consistent with Darwinistic interpretations of evolutionary biology, in which association and reciprocity are forms of “fitness” that contribute to the survival of social species of various kinds. For human societies, collective agreement and action are advantageous, if not vital.

The emphasis following Hardin was on common land, for uses such as grazing and abuses such as deforestation (Gibson et al. 2000; Agrawal and Gibson 2001; Moran 2010). Less attention was paid to water and firewood, which are especially important for livelihoods in Africa and Asia. Fishing was studied quite frequently, but hunting has not been considered legitimate. Wild collection of fruits, nuts, fibers and medicinal plants, among other uses of biodiversity, has received relatively little attention.

Elinor Ostrom (1990, 2002) and her followers at the University of Indiana have

** Revised version of a paper prepared for the Pre-Conference Workshop 11, “Defining an Applied Research Programme for the UNDP-GEF Small Grants Programme on Community-Based Natural Resource Management and the Challenge of the Commons,” 13th Biennial Conference of the International Association for the Study of the Commons (IASC), “Sustaining Commons, Sustaining our Future”, Hyderabad, India, January 9-15, 2011.*

pointed out that, in spite of conventional microeconomic theory, individuals do not always compete instead of cooperating. They have shown that communities can often solve their problems better than government or companies. Citing experiences from around the world, Ostrom proved that cooperation at the community level is possible and for this she won the Nobel Prize for Economy in 2009. The International Association for the Study of the Commons has continued to generate knowledge on the subject and raise new questions (IASC 2011).

BRAZIL IN THE INTERNATIONAL CONTEXT

Brazil, a New World country, after directly or indirectly liquidating most of its original indigenous population (Hemming 1978), now has a population of 195 million made up mostly of descendants of European immigrants and African slaves, as well as dozens of indigenous peoples, maroons (*quilombolas*) and traditional peoples, with all kinds of blending of origins and identities. Assuming an average of 300 people per community, there 100,000 local communities in the rural population of some 30 million people.

Historically, Brazilian *bandeirante* explorers and North American pioneers were considered radically different (Moog 1959). It was thought that *bandeirante* explorers of the interior sought to “get rich quick and split,” while pioneers were more sustainable, in today’s language. Today, traditional and pioneer communities in the interior, which tend toward “selective modernity” (Souza 2000), but in a legitimate and positive way, are key to systemic sustainability.

Since the Land Law of 1850, on the whole, Brazil only recognizes private property to land with individual title. With few exceptions, access to land is only permitted through purchase. The law was apparently designed to keep runaway or freed slaves off the land and available as labor force for the agrarian-export economy. Since then, there has been some agrarian reform, mostly frontier settlement, but little provision has been made for access to natural resources, except in a few specific cases.

The country is so large, covering half of the South American continent, that granting official deeds to property lags far behind needs, at least in the northern and western interior regions, and there is much abuse. The open frontier in Brazil, without clear property rights, has led to vast deforestation, which is even used as a way for land-grabbers (*grileiros*) to claim and resell land. Much land is officially public, but it is often acquired through illegal manipulation. Frontier ranching is a means to gain profit through speculation as well as various associated illicit activities (Sawyer 2011a).

The emphasis on land and “territories” for traditional peoples and communities in Brazil (Sauer and Almeida 2010), while fundamental, has obscured other alternatives for production and livelihoods using natural resources. While the subsoil is federal property, water is a public good and access to one’s own property through that of

neighbors (*servidão*) is guaranteed, there is practically no recognition of other rights to space or resources. Traditional rights are not recognized, except land for indigenous peoples and, as of the 1988 Constitution, for *quilombolas*. There is nothing like “tree rights,” as found in Africa, which could be inspiration for institutional innovation.

It might be pointed out that public money in Brazil has some parallel with Hardin’s commons. It often seems to be available for the taking, with little or no collective concern. “Commonwealth” seems to have another meaning in Brazil. Money is now becoming more important than land, which has become more of a financial asset than a means of production or of making a living.

The thrust of policy in Brazil has been to promote conservation in isolated protected areas and development in the rest of the country (Diegues 1998). Biocentric and anthropocentric approaches have been followed in parallel ways in different spaces rather than being merged in sustainable development.

PRODUCTS FROM COMMON PROPERTY OR ACCESS

In spite of its strong industry and agribusiness, Brazil is outstanding in the variety, volume and value of products from common rural property or access to natural resources (Sawyer et al. 1997; Anderson and Clay 2002). The Brazilian experience in this regard can be divided into ten categories: hunting and wildlife management, fishing, grazing, mining, wood, rubber and oils, fruits and nuts, honey, medicinal plants and crafts.

In general, these activities are considered in Brazil to be types of “extractivism,” according to use of the word in Portuguese, which usually refers to plants rather than minerals (Homma 1989, 2008; Allegretti 2002; Cunha and Almeida 2002). Nowadays, as opposed to the classic situation of the rubber boom in the late nineteenth and early twentieth centuries, wild collection and sale of non-timber forest products are almost always complementary and seasonal activities, usually associated with farming, rather than a full-time occupation, and sales are often informal and unrecorded in official statistics (Young et al. 2012).

In addition to experiences of PPP-ECOS in the Cerrado and transitions to neighboring biomes, other cases of community use of natural resources, especially biodiversity, are cited when pertinent. The broad range of experience is important to identify similarities and differences that may be relevant for policy formulation with regard to common property or access to natural resources outside individual or community properties or territories.

Hunting and Wildlife Management

Historically, in pre-historic times and in antiquity, hunting, usually combined with gathering, was mankind’s main use of the land, which was owned collectively or



not all. The same is true among many indigenous groups in Brazil until the present day. Subsistence hunting has also been relevant among the rural population in general since the colonial times. Nowadays it often happens in clandestine ways on private land. Killing wildlife is now illegal, being considered a crime without bail, but it can be legal if it is necessary for survival. Because of strict environmental law, bush meat is not common. There has also been trade in animal skins, which is now also illegal.

Wildlife management, on the other hand, is legal but difficult to implement, especially in view of strict regulation, in order to prevent disguised hunting (Pádua 2xxx). Pigs, rheas, capybaras and turtles are now raised by a few local organizations and various indigenous groups (Silva Neto 2010). The price of such meat is much higher than beef, pork or chicken. Semi-extensive wildlife management requires large areas of land, thus being possible for indigenous groups, but difficult for small farmers.

Fishing

Water is more clearly a common resource than land. In Brazil, it is legally a public good. Fish in public water bodies (rivers, lakes and the ocean) are also not private property. Following Hardin, pioneering work was done on fishing accords in the Amazon which made it possible to regulate access and exclude third parties, including neighboring communities and industrial fishers (McGrath et al. 1994; Almeida et al. 2009).

Support for projects of fish farming by smallholders has been discouraged by the fines imposed by environmental authorities for interfering with the flow of streams. One of the frequent problems with fish farming is now the robbery of fish. When farmers go to harvest the fish, few are left in their ponds. In that sense, their private property has become common.

Grazing

In human history, domestication of animals led to grazing on native grasslands. Species from the Old World have spread over native and planted pastures in Brazil, where little or no native megafauna can be found. Cattle spread to grassland in the interior of the Northeast and Center-West of Brazil. In northern Minas Gerais, *chapadas* (flat plateaus) have been used by communities for grazing cattle, while small farming is done in the valleys (Assad et al. 2009). Goats are common in the scrub growth of the semi-arid Northeast. There are also extensive *fundos de pasto* (outback pastures) held in common.

While large-scale cattle-raising is one of the main causes of deforestation, small-scale livestock, especially dairy cattle, is part and parcel of family farming. It is a source of milk and meat (i.e. protein) and monetary income throughout the year as well as being a form of savings (Herrero 2010; Carvalho 2012). Small-scale cattle raising would be appropriate in a sustainable livelihoods approach. Cattle even use

native biodiversity as a source of food, as does beekeeping, and grazing helps control the aggressive exotic African species of tall pasture grasses, which also aggravate the risks of intense fires that kill trees and spread far.

Mining

In Brazil, since colonial times, small-scale informal miners or panners called *garimpeiros* have always panned for gold, diamonds and other minerals in areas that are public or private. They boomed in the 1980s at points like the legendary Serra Pelada, in southern Pará, and remain active over wide ranges at present, even crossing borders into Venezuela.

Many *garimpeiros* have elaborate organized systems of dividing the mining areas in what is otherwise no-man's land (Pereira 1990). Even when they are technically outlaws, they have laws of their own. They demonstrate that collective management of natural resources can be done outside the legal system.

Sand, clay and stone are removed from the land, streams and rivers all over Brazil for construction. For communities, mineral resources are used on a small scale for ceramics, including indigenous groups, and in a few cases for jewelry or decorative craft objects.

Wood

Timber is now being managed by communities in the Amazon for sale on the market (Amaral and Amaral 2000; Amaral 2008). Wood is often used directly by families as construction material for houses (walls and roofs) as well as pens and fences for livestock. Firewood also remains important for domestic use in all of northern and northeastern Brazil. Charcoal has both domestic and industrial use, for production of pig iron, including use of uncracked babassu palmnuts. There is relatively little use of wood for small objects, as is common in Costa Rica.

An interesting new opportunity for working with wood is biochar, the dark earth ("*terra preta do índio*") discovered in the Amazon. Pre-historic indigenous groups incorporated organic matter into the soil, making it much more fertile. Modern introduction of charcoal into the soil would be carbon negative, constituting a permanent carbon sink, as well as making fields last longer and therefore reducing the need for new clearing. Care must be taken to avoid clearing specifically for this purpose, but dead wood and pruning could be used without generating new emissions.

Rubber and Oils

In the 19th century and the mid-20th century, the Amazon's rubber tappers settled on private rubber estates (*seringais*) divided into family holdings (*colocações*) of about 350 hectares. These stretches of forest were ceded to each tapper in a kind of debt peonage or disguised wage-labor. There was no farming permitted and the



landowners' inspectors enforced the rules. When owners of the rubber estates left the region after collapse of the rubber boom in the second decade of the past century or a brief resurgence during World War II, some tappers stayed in the forest divided into family holdings and worked as autonomous producers (Allegretti 2002).

The experience with rubber makes clear that the area of *colocações* for sustainable use of biodiversity is much too large for new settlements. In tropical regions, even a relatively dense natural resource needs areas far larger, by an order of magnitude, than the official agricultural settlement plots of 30-50 hectares.

Fruits and Nuts

After rubber collapsed, Brazil nuts became a mainstay of the Amazon economy. Collectors migrated temporarily to collection areas in remote forest areas which were not their holdings or property. Nowadays, babassu palmnuts are the main livelihood for hundreds of thousands of women in Maranhão and Tocantins (Carrazza et al. 2012). Their social movements defend "Free Babassu" laws, which prohibit clearing or killing of the palm trees and provide for free access by collectors.

In northern Minas Gerais, *geraizeiros* collect native fruits called *pequi* (Oliveira and Scariot 2010) and *coquinho azedo* (Lima et al. 2010) on the *gerais*, a kind of commons now being occupied by eucalyptus plantations (Sawyer and Carvalho 2012). The *pequi* tree is protected by law in Minas Gerais, but there is no provision for rights to use. Other important fruits or nuts collected in forests or on farms include *baru* and *buriti* (Saraiva 2009; Magalhães 2011; Sampaio and Carrazza 2012).

Fruits and nuts are the most accessible products for "agroextractivists" in large parts of Brazil. However, the experience makes clear that it is necessary to work with a large variety of products, since large-scale production by hundreds of local communities would drive prices down, by simply functioning of supply and demand.

Another issue is scale. Biodiversity necessarily implies spatial dispersion of populations rather than pure stands. Except from some oligarchic species, like babassu, density is necessarily low. This makes processing more difficult because of the long distances and lack of economies of scale. The situation is made worse by the high costs of compliance with strict regulatory frameworks (Sawyer 2009, Simoni 2012). One of the alternatives would be enrichment or densification through planting of seeds or seedlings.

Honey

Nectar from native or exotic species of flowers visited by native or exotic species of bees is turned into honey and other products like wax, pollen and royal jelly. Most local organizations work with European and African bees (*Apis mellifera*), while a few others work with various species of stingless native bees. It was thought that exotic species harm native flora and bee fauna, but it is now clear that they are complementary and can be used in different ways in native or altered landscapes.

There is a large domestic market for honey in Brazil, and the international market seems to be growing because of the reduction of hives caused by a disease which is killing off bee populations in developed countries. The main obstacle is the need for certification by the Federal Inspection System (SIF) or local equivalents, which are beyond the reach of most local communities.

Medicinal Plants

Medicinal plants have strong traditions, as recorded by the Pacari Network in their *Farmacopeia do Cerrado* (Dias and Laureano 2009). The prices of medicines are much higher, by orders of magnitude, than prices of raw materials or semi-processed goods. The problem faced by phytotherapy in Brazil is severe restrictions imposed by health authorities, which make it practically impossible to collect, process or market medicinal plants or products. An alternative has been to work with cosmetics.

The most important issue for research in this area is to find ways to show that medicinal plants can be safe and effective enough to be considered legitimate alternatives and be included in the health regulations, which are extremely strict in Brazil. Since some other countries are more flexible about regulations, international exchange on this subject would be important.

Crafts

Golden grass (*Singhnantus sp.*), mainly from the Jalapão region in northeastern Tocantins, is one of the most outstanding uses for handicrafts of a resource often collected on common land (Schmidt et al. 2009; Sampaio et al. 2010). In other areas, native dyes are used for textiles. Bio-jewelry and furniture are also produced by some local organizations. Many indigenous groups sell handicrafts.

Generally speaking, crafts permit high levels of added value with small volumes of raw material, i.e. lower risks of overexploitation of natural resources. They also have the advantage of not being subject to overregulation by health authorities, as are foods and medicines, although material from animals (feathers, teeth, shells etc.) can cause trouble with environmental authorities.

The main issue with crafts is how to achieve scale without losing the authenticity, identity and quality which are characteristic of individual artists. Where labor is relatively expensive, as in Brazil, exports may be out of the question, except on a limited scale for specific niche markets.

COLLECTIVE LAND, CONCESSIONS AND USE RIGHTS

In spite of the land tenure legislation in Brazil, with its emphasis on individual private property of land, various alternatives have been developed for community access to public land, although their scale is limited because they require that government pay large sums to private land owners.



Indigenous lands (TI) have long been a kind of reserve corresponding to collective rights to land (Ricardo and Ricardo 2011). After the 1988 Constitution, *quilombos* of Afro-descendant or maroon communities, not necessarily descendants of slaves, are also common property (Drummond and Franco 2009).

The National System of Units for Conservation of Nature (SNUC), established in 2000, provides for two categories of protected areas, one for “integral protection” and another for “sustainable use” (Drummond et al. 2009; Sawyer 2011b). Integral protection in various kinds of parks and reserves does not allow for human presence except for visitation and research. Sustainable use conservation units include Extractive Reserves (RESEX), Sustainable Development Reserves (RDS), National Forests (FLONA) and Environmental Protection Areas (APAs), among others.

Extractive Reserves are an original Brazilian innovation in protected areas with concessions for use, originally for rubber tappers, but later extended to other groups, including fisher communities. Sustainable Development Reserves likewise allow for human presence, with minimal differences. National Forests also permit use by communities. According to land legislation, not part of SNUC, Extractive Settlement Projects (PAEs) are another form of providing land for settlers, but not for farming. PAEs are established by the National Institute for Colonization and Agrarian Reform (INCRA).

Use rights could be established regardless of property rights, as in the case of Free Babassu, the experience in Maranhão which could be extended to other areas and other products. Its implementation probably requires contracts with specific groups rather than legal provision of free access to all, be they poor local communities or rich businesses belonging to outsiders.

LESSONS LEARNED

Various lessons about common land and natural resources can be learned from the experience accumulated to date at the local level in Brazil and elsewhere, as well as other experiences that can be seen in the field or are described in the scientific and technical literature (Hall 1997; Anderson and Clay 2002). So far, there have been few systematic attempts.

Use of native biodiversity, as opposed to cultivation, necessarily implies low density and dispersion of the species used. Mathematically, more species mean greater average distances among individuals in a population. This wide distribution also implies spatial mobility of collectors, especially when extraction is seasonal and is combined with other activities, usually farming. Agriculture, on the other hand, is more sedentary and implies spatial concentration and permanence.

Processing is even more concentrated in space and more constant in time than primary production. It requires centralization, except in cases which do not depend on capital, as in the case of manual cracking of babassu palmnuts by women yielding

machetes and clubs. Perishable products make centralization more difficult. Added value can overcome some of the limitations of dispersion, as in the case of golden grass, which is made into expensive baskets, mats and bio-jewelry.

Given the wide spatial distribution of native species, the problem for collectors is not limited to land, but also includes their access to natural resources outside their territories. Difficulties of access in a locality or region increase as demographic and/or economic density grows, especially when economic growth involves clearing of the forests or other natural vegetation.

It can be seen in the variety of experiences in Brazil that different uses of natural resources have different implications: farming, grazing, collection (gathering), beekeeping, hunting, fishing etc. Use of natural resources for consumption (subsistence) is different from sale on the market. In many cases, subsistence and sale can be combined, or sale of some products makes subsistence possible as an alternative to migration.

There are important differences between property and access to or use of natural resources. There is need not just for agrarian reform, distributing small parcels of land to individual families, but also providing access to natural resources. It is also necessary to regulate wild collection or beekeeping on land belonging to third parties or government.

At the micro-regional, regional and national level, sustainable productive landscapes are the only way to achieve the scale necessary to maintain most of the ecosystem functions of aquatic resources, biodiversity and carbon ("ABC"). Such landscapes can combine farming in the fields with wild collection in the forests or other ecosystems. For both social and environmental reasons, eco-social landscapes are by far preferable to large-scale monocultures or pasture.

Sustainable productive landscapes can be complex mosaics. At the family or community level, agroforestry systems can be combined with crops and cattle. In addition to pure systems, it is possible to enrich natural or degraded areas by planting useful native species. The focus should be on the family unit and the landscape, not on isolated crops or fragments of land.

Sustainable use of biodiversity is not limited to rural areas. Towns and cities, which are spreading over the interior and forming networks that become increasingly close to farmers (Monte-Mór 2004), are essential for processing and marketing. Furthermore, people living in urban areas or having multiple residence (i.e. women and children living in town because of schools and health care) often participate in primary production, making direct use of natural resources.

Common land or resources are almost always combined with forms of individual property. Access to the commons should not be open to anyone from anywhere, but limited to members of specific groups, including their family networks. This can be done through private agreements or contracts regulated by official norms.



Even when there is sufficient access to land and natural resources, local communities attempting to use these resources and market products face numerous obstacles placed by inappropriate regulatory frameworks with regard to formal organization, environmental permits, labor legislation, tax collection, health norms and access to credit, among others (Sawyer 2009; Simoni 2012).

Finally, access to natural resources needs to be combined with policies regarding access to public goods and services of various kinds and to the financial resources needed for reproduction of families and communities and for their production systems based on the land and its natural resources. Public money goes disproportionately to the rich and powerful.

CONCLUSIONS AND RECOMMENDATIONS FOR RESEARCH AND POLICY

The basic question is “common to whom?” It is not only a question of public versus private, individual versus collective, but what is the specific collectivity in question. Common access should refer to a group, not being open to all who may show up, regardless of their commitment. Groups need to be defined in terms of tradition or membership acquired by mutual agreement. The appropriate uses of the commons also need to be defined.

The means to achieve these ends in Brazil and other developing countries might include the following measures:

1. Special attention to communities of small farmers and traditional and indigenous communities whose natural resources are under the greatest pressure by agribusiness, industry and infra-structure projects.
2. Land reform policies that take into account the need for access, not just to small parcels of land, but also to natural resources outside the individual lots, the sustainable use of which helps generate food security and complementary income, making better use of family labor over the year, as well as helping to maintain ecosystem functions at the scale of landscapes.
3. Regulations about sustainable use of various kinds of protected areas taking into account the fact that presence of human groups which have low impact and are concerned about protection is usually preferable as compared to protection by underfunded and understaffed government agencies.
4. In Brazil, appropriate regulation of sustainable use of natural resources in Legal Reserves (RL) on a given percentage of each rural property and Areas of Permanent Preservation (APP) in vulnerable spaces (e.g. edges of rivers and streams, hilltops, slopes) established by the Forest Code.
5. Establishment of Indigenous and Community Conserved Areas (ICCAs) or

similar arrangements recognized by authorities in social, economic or cultural areas, with official national and/or international recognition, above and beyond conventional and more rigid protected area systems usually administered by environmental authorities.

6. Models for agreements or contracts between communities and government or landowners to provide limited access to natural resources on land (large or small properties) not belonging to small farmers and collectors, according to rules (official and agreed) about who has access and what can be done, excluding predatory use.
7. Above and beyond regulation of access to natural resources both on and off property, appropriate regulations regarding transportation of non-timber forest products so that they can be consumed at home, processed and/or sold on markets.
8. Guidelines determining that “exclusion of third parties” foreseen in schemes of Reduction of Emissions from Deforestation and Degradation (REDD and REDD+) should not abolish or restrict access to the commons used by small farmers and traditional communities.
9. Specific policies or exceptionalities to general rules and regulations about environment, health, taxes etc. for traditional peoples and communities and indigenous groups when such rules impede sustainable use.
10. Mechanisms for providing credit or micro-credit for sustainable use activities of collection and processing by groups or individual members of groups without requiring individual property or land deeds as collateral for loans.
11. Mechanisms to provide for access to “common money” (public funds) and the various social protection schemes and services of health, education, disability, retirement etc.
12. Policies for rural settlement and development that take into account families with off-farm activity and with multiple residence, as well as members living and working in urban areas.

Small grants around the world have provided support for many initiatives that have to do with common property or access to natural resources. They should continue to do so, and to generate useful knowledge. In order to generate large-scale benefits, the lessons learned need to be used to formulate appropriate policies for sustainable development, combining human needs with the maintenance of ecosystem functions over the long run. This can only be done on a macro scale, using an approach that is neither biocentric nor anthropocentric, but takes advantage of synergies.



REFERENCES

AGRAWAL, Aun; GIBSON, Clark C. (Eds.). **Communities and the environment: ethnicity, gender and State in community-based conservation**. Rutgers: Rutgers University Press., 2001

ALLEGRETTI, Mary Helena. **A construção social das políticas ambientais: Chico Mendes e o movimento dos seringueiros**. Brasília: Centro de Desenvolvimento Sustentável, Universidade de Brasília. Tese de doutorado. 811p, 2002.

ALMEIDA, Oriana T.; LORENZEN, K.; MCGRATH, David. Fishing agreements in the lower Amazon: for gain and restraint. **Fisheries Management and Ecology**, v.16, p.61-67, 2009.

AMARAL, Paulo et al. **Manejo florestal comunitário na Amazônia brasileira: avanços e perspectivas para a conservação florestal**. Brasília: Serviço Florestal Brasileiro, 2008.

AMARAL, Paulo; AMARAL NETO, Manuel. Manejo florestal comunitário na Amazônia brasileira: situação atual, desafios e perspectivas. Brasília: Instituto Internacional de Educação do Brasil, 2000.

ANDERSON, Anthony; CLAY, Jason (Orgs.). **Esverdeando a Amazônia: comunidades e empresas em busca de práticas para negócios sustentáveis**. São Paulo: Peirópolis; Brasília: Instituto Internacional de Educação do Brasil. ISBN 85-85663-89-8, 2002.

ASSAD, Luís Tadeu; LITRE, Gabriela; NASCIMENTO, Elimar Pinheiro do. **A vida por um feixe de lenha: experimento metodológico de gestão de conflitos socioambientais**. Brasília: IABS, Abaré. 148p. ISBN 978-85-99827-07-9, 2009.

CARRAZA, Luis; ÁVILA, João Carlos Cruz e; SILVA, Mariane Lima da. **Aproveitamento integral do fruto e da folha do babaçu (*Attalea spp.*)**. Brasília: ISPN, 2012.

CARVALHO, Igor Homem de. **Assentamento Americana e Grupo Agroextrativista do Cerrado: uma experiência agroecológica no Norte de Minas**. Brasília, Grão Mogol: Universidades e Comunidades no Cerrado (UNICOM) 2012.

CUNHA, Manuela Carneiro da; ALMEIDA, Mauro Barbosa de (Orgs.). **Enciclopédia da floresta: o Alto Juruá, práticas e conhecimentos das populações**. São Paulo: Companhia das Letras. 735p. ISBN 85-359-0238-4, 2002.

DIAS, Jaqueline Evangelista; LAUREANO, Lourdes Cardozo (Orgs.). **Farmacopeia popular do Cerrado**. Brasília: Articulação Pacari, 2009.

DIEGUES, Antônio Carlos. **O mito da natureza intocada**. São Paulo: Hucitec, 1998.

DRUMMOND, José Augusto Leitão. 1990. O inseguro bote salva-vidas: uma crítica a Garrett Hardin. **Contexto Internacional**, n.12, jul./dez., p.99-108, 1990.

DRUMMOND, José Augusto Leitão; FRANCO, José Luiz de Andrade. **Terras de quilombolas e unidades de conservação**: uma discussão conceitual e política, com ênfase nos prejuízos para a conservação da natureza. Grupo Iguazu, 2009.

DRUMMOND, José Augusto Leitão; FRANCO, José Luiz de Andrade; NINIS, Alessandra Bortoni. Brazilian federal conservation units: a historical overview of their creation and of their current status. **Environment and History**, n.15, p.463-91, 2009.

GIBSON, Clark C.; McKEAN, Margaret A.; OSTROM, Elinor. **People and forest**: communities, institutions and governance. Cambridge: MIT Press. (Politics, Science and the Environment Series), 2000.

GREEN, Donald P.; SHAPIRO, Ian. **Pathologies of rational choice theory**: a critique of applications in political science. New Haven: Yale University Press, 1994.

HALL, Anthony L. **Sustaining Amazonia**: grassroots action for productive conservation. Manchester: Manchester University Press, 1997.

HARDIN, Garret. The tragedy of the commons. **Science**, n.162, 13 dez., p.1243-8, 1968.

HARDIN, Garret. Living on a lifeboat. **Bioscience**, v.24, n.20, out., p.561-8, 1974.

HEMMING, John. **Red gold**: the conquest of the Brazilian Indians. London: Macmillan, 1978.

HERRERO, M. et al. Smart investments in sustainable food production: revisiting mixed crop-livestock systems. **Science**, v. 327, n.5967, p.822-25, 2010.

HOMMA, Alfredo K.O. **A extração dos recursos naturais renováveis**: o caso do extrativismo vegetal na Amazônia. Viçosa: Universidade Federal de Viçosa. Doutorado em Economia Rural, 1989.

HOMMA, Alfredo K.O. **Extrativismo, biodiversidade e biopirataria na Amazônia**. Brasília: EMBRAPA Informação e Tecnologia, 2008.

IASC. **Sustaining commons**: sustaining our future. Hyderabad: International Association for the Study of the Commons, 2011.

ISPN. **Long live the Cerrado!** Brasília: Instituto Sociedade, População e Natureza, 2006.

LIMA, Victor Vinícius; SILVA Priscila; SCARIOT, Aldicir. Boas práticas de manejo para



o extrativismo sustentável do coquinho azedo. Brasília: EMBRAPA Recursos Genéticos e Biotecnologia, 2010.

LOBO, Andréa; FIGUEIREDO, Isabel; ANDRADE, Karenina (Orgs.). **Sementes lançadas, frutos colhidos**: o Programa de Pequenos Projetos Ecosociais. Brasília: Pesquisa e Conservação do Cerrado (PEQUI); Instituto Sociedade, População e Natureza (ISPN), 2010.

MAGALHAES, Rogério. **Obstáculos à exploração do baru (*Dipteryx alata* Vog.) no Cerrado goiano**: sustentabilidade comprometida? Brasília: Centro de Desenvolvimento Sustentável, Universidade de Brasília. Tese de doutorado, 2011.

McGRATH, David; CASTRO, Fábio de; FUTEMA, Célia. **Reservas de lago e o manejo comunitário da pesca no Baixo Amazonas**: uma avaliação preliminar. Belém: Núcleo de Altos Estudos Amazônicos, Universidade Federal do Pará, 1994.

MONTE-MOR, Roberto Luis de Melo. **Modernities in the jungle**: extended urbanization in the Brazilian Amazônia. Los Angeles: University of California. Ph.D. Urban Planning, 2004.

MOOG, Clodomir Vianna. **Bandeirantes e pioneiros**: paralelo entre duas culturas. Rio de Janeiro: Ed. Globo, 1959.

MORAN, Emilio F. **Environmental social science**: human-environment interactions and sustainability. Hoboken: WileyBlackwell, 2010.

NOGUEIRA, Mônica. **Quando o pequeno é grande**: uma análise de projetos comunitários no Cerrado, 2005.

OLIVEIRA, Washington Luis de; SCARIOT; Aldicir. **Boas práticas de manejo para o extrativismo sustentável do pequi**. Brasília: EMBRAPA Recursos Genéticos e Biotecnologia, 2010.

OSTROM, Elinor. **Governing the commons**: the evolution of institutions for collective action. Cambridge: Cambridge University Press, 1990.

OSTROM, Elinor et al. (Eds.). **The drama of the commons**. Washington: National Academy Press, 2002.

PEREIRA, Alberto Carlos Lourenço. **Garimpo e fronteira amazônica**: as transformações dos anos 80. Dissertação de Mestrado. Belo Horizonte: Centro de Desenvolvimento e Planejamento Regional, Universidade Federal de Minas Gerais, 1990.

RICARDO, Carlos Alberto; RICARDO, Fany (Orgs.). **Povos indígenas no Brasil 2006/2010**. São Paulo: Instituto Socioambiental, 2011.

SAMPAIO, Maurício Bonesso; CARRAZA, Luis. **Aproveitamento integral do fruto**

e da folha do buriti (*Mauritia flexuosa*). Brasília: ISPN, 2012.

SAMPAIO, Maurício Bonesso; SCHMIDT, Isabel Belloni; FIGUEIREDO, Isabel Benedetti; SANO, Paulo Takeo. **Boas práticas de manejo para o extrativismo sustentável do capim dourado e buriti**. Brasília: EMBRAPA Recursos Genéticos e Biotecnologia, 2010.

SARAIVA, Nicholas Allain. **Manejo sustentável e potencial econômico da extração do buriti nos lençóis maranhenses**. Dissertação, Centro de Desenvolvimento Sustentável, Universidade de Brasília, 2009.

SAUER, Sérgio; ALMEIDA, Wellington (Orgs.). **Terras e territórios na Amazônia: demandas, desafios e perspectivas**. Brasília: Editora da Universidade de Brasília, 2011.

SAWYER, Donald. **Posicionamentos do PPP-ECOS**. Brasília: ISPN, 2005.

SAWYER, Donald. **Entraves regulatórios de atividades extrativistas na Amazônia: problemas, enfrentamento e soluções**. Brasília. Nota Técnica elaborada para o Centro de Gestão de Estudos Estratégicos (CGEE), com apoio da Secretaria de Assuntos Estratégicos (SAE) da Presidência da República, 2009.

SAWYER, Donald. **O nome dos bois: lucratividade e legalidade da pecuária na fronteira**. Brasília: ISPN, 2011a.

SAWYER, Donald. Unidades de conservação, uso sustentável e funções socioecossistêmicas na Amazônia e no Brasil. In: SAUER, Sérgio; ALMEIDA, Wellington (Orgs.). **Terras e territórios na Amazônia: demandas, desafios e perspectivas**. Brasília: Editora da Universidade de Brasília. p.363-80, 2011b..

SAWYER, Donald; REE, Marco van der; PIRES, Mauro Oliveira. Comercialização de espécies nativas do Cerrado. In: ROSA, Sueli L. Couto (Org.). **Os (des)caminhos do desenvolvimento rural brasileiro**. Anais VI Encontro Regional Centro-Oeste. Brasília: Associação Projeto de Intercâmbio de Pesquisadores Sociais da Agricultura (APIPSA). p.149-69, 1997.

SAWYER, Donald; CARVALHO, Igor S.H. de. Territórios e usos da biodiversidade no Norte de Minas: causas estruturais dos conflitos socioambientais. In: GUEDES, Gilvan Ramalho; OJIMA, Ricardo (Coord. e Co-Org.). **Território, mobilidade populacional e ambiente**. Governador Valadares: Ed. UNIVALE, p.71-92, 2012.

SCARIOT, Aldicir; SOUSA-SILVA, José Carlos, FELFILI, Jeanine (Orgs.). **Cerrado: ecologia, biodiversidade e conservação**. Brasília: Ministério do Meio Ambiente, 2005.

SCHMIDT, Isabel B.; FIGUEIREDO, Isabel B.; SCARIOT, Aldicir. Ethnobotany and harvesting effects on population ecology of *Syngonanthus nitens* (Bong.) Ruhland (Eriocaulaceae), a NTFP from Jalapão region, Central Brazil. **Economic Botany**, v.61,

p.73-85, 2007.

SEN, Amartya. **The idea of justice**. Cambridge: Harvard University Press, 2010.

SILVA NETO, Paulo Bezerra da. **Relatório sobre os projetos de uso e conservação da fauna em terras indígenas**. Iguape: Núcleo de Pesquisa e Conservação da Fauna e Flora Silvestre, 2010.

SIMONI, Jane. **Entraves regulatórios na produção agroextrativista**. Brasília: ISPN, 2012.

SOUZA, Jessé. **A modernização seletiva: uma reinterpretação do dilema brasileiro**. Brasília: Editora da UnB, 2000.

YOUNG, C.E.E.; MEDEIROS, R.; QUEIROZ, J.; PEREIRA, G.S. 2012. **Extrativismo vegetal de produtos não madeireiros no Brasil**. Brasília: MMA/SEDRS/DEX.

