Legal Aspects of Amazonian Floodplain (Várzea) Conservation: Opportunities & Difficulties of the Commons Management

SURGIK, Ana Carolina. National Institute of Amazonian Research (INPA), Manaus, AM, Brasil. carolinasurgik@hotmail.com

Introduction

The várzea is a complex ecosystem, with many biological resources of human appropriation human. The Amazonian rivers and its flooding areas cover more than 300,000 km^2. For many generations the flooding areas have been used for populations of the Amazônia, in the dry season and in the flood season. However, for the maintenance of the life human being in these regions, it is necessary also to conserve this ecosystem so that it does not lose its original attributes. It is necessary to conserve the species and, consequently, the populations that depend of them.

One of the approaches of the várzea's use is the legal aspect. The researches, perspectives and ways of better exploitation of this ecosystem need a legal basement on the effective possibilities of its use. It is necessary to define the legal possibilities of human interferences to establish directed public politics for the conservation of the várzea areas and human maintenance. In function of this, this study took into account the definition, legal constitution, domain and jurisdiction of the Amazonian várzea. However, was identified in the current brazilian legal system, many practical problems to insert the várzea's management in the methods and legal procedures. Therefore, the main was to get a legal basement, with consistent interpretation for the environment conservation and the social-economic sustainable of human populations.

The law was analyzed taking into account the social and envinonmental function of the property. This function must in such a way be respected in the economic activities (art. 170 of the Federal Constitution), and in the agricultural agrarian politics (art. 186). social function must promote the "use adequate of the available natural resources and preservation of the environment" (art. 186).

Consequently, in this study was made a critical analysis of the brazilian law. It is demonstrated, sometimes, that the current legal system does not support the protection of this ecosystem, and that is necessary to adjust the different circumstances to different legal procedures. This work is eminently legal-theoretician of doctrine collection and interpretations as form to subsidize its more adequate interpretation and implementation. So, it was opted, for adding the discussion with the results.

Results and discussion

Definition

To check the legal treatment of the várzea, it is necessary to identify what it is this natural event. It doesn't exist in Brazil a clearly legal concept of várzea. The only definition is in the Resolution CONAMA 4/85 (maximum seasonal channel: flooded areas during the wet season). However, this definition encloses all the flooded areas, and not just the várzea. According to Vieira (2000), the legislation used other terms to define the várzea, as river channel and river seasonal channel.

For its nature, Vieira (2000) studied that várzea also is included in the alluvial soils definition of the Water Code (Decreto 24643/34, arts. 9º and 16), formed for the part of the chains that arrives the high water level, or of the level point of usual floods, as well as the part of the chain that is discovered for the removal of waters.

These definitions are not incorrect, but they are sufficiently generic, and they ignore some differences of flooded areas, including the várzea. These differences are important in Amazônia, because they vary the biological characteristics, and with this, the possibilities or not of use without exhaustion of the existing resources (constitutional socio-environmental protection). However, there isn't consensus of these definitions even between researches. It was opted to

adopting a scientific terminology (that encloses the biggest amount of aspects, as vegetal covering, type of water and duration of flooding), and to the popular nomenclature, that has regional variations. According with Prance (1980), there are seven main types of flooded vegetation on Amazonian soils, five of which with periodic flood, and two with permanent ones:

"*Floresta de planícies inundáveis*": flooded forests for irregular and/or fast rain, instead of seasonal flooding of the great rivers (prance, 1980).

"*Manguezal*": it is periodically flooded areas by salty water, by daily movement of the tides (Prance, 1980).

"*Floresta de Pântano*": it is permanently flooded forest by white water. It is rarer in the Amazônia. In low Brazilian Amazon it has been called igapó, confirming the confusion of the terminology (Prance, 1980).

"*Igapó permanente*": it is permanently flooded forest by black or clear water. Also it is rarer in the Amazônia (Prance, 1980).

"*Igapó*": it is periodically flooded areas by black and clear water rivers, with poor annual cycles in suspended and dissolved materials (they do not carry sediment), producing low soil fertility. With this, it has poor vegetation, low biomass, low diversity of vegetation species (Prance, 1980; Ayres, 1995).

"*Várzea*": it is periodically flooded areas by white water rivers, with rich annual cycles in suspended and dissolved materials (they carry great amount of sediments), producing high soil fertility. With this, it is constantly renewed by nutrients, therefore it is submerged for almost six months by year. It has great diversity of vegetation species, with high biomass, great trees and fast growth. It is the most common of all types of flooded areas of the Amazônia (Sioli, 1967; Prance, 1980; Junk, 1989; Ayres, 1995).

"*Várzea de maré*": it is flooded forest daily, two times, for the movements of tides. The high tide blocks the flow of the rivers and makes with that they flood the forest. Part of this várzea was

defined by law as “terrenos de marinha” (riverine land), however, only 33m measured horizontally for the part of the land.

There are also flood areas of forest by mixed waters, being under influence of the two types of water, as in the region of Manaus, with the union of the Negro river (black water) and Solimões river (white water) (Prance, 1980).

Well, defined the generically term of várzea, it is necessary to shouw that there are different types of várzea, that also bring biological differences e, therefore, must be considered in the regulations of the human appropriation, such as differences about the relief, as: “várzea alta” (flooded for a small period in the flooded season), and “várzea baixa” (flooded by a longer period) (Aubréville, 1961). And about vegetation formations, as: “restinga” (located on the highest forest lands, with the biggest diversity of species, basal area and number of trees for unit of area, “restinga baixa” (low) is frequently cleaner, with good visibility (Ayres, 1995) and “chavascal” (opened area, in lowest lands, with low vegetation and almost impossible to transpose during the dry season. Extensive areas of chavascal are common between lakes, canals and rivers (Ayres, 1995). There are still opened areas of varzea, that in the dry station is covered for grassy vegetation tripping (Ayres, 1995).

But after all, why it is important to differentiate the types of flooding areas and the types of várzeas for the Law? Because the legal definition is generic, and can stimulates the inadequate and degrading use of some flooding areas when it groups all in an only definition. It was demonstrated that flooded areas have differences about the support ability. Igapó is poor in nutrients for its type of water, already the várzea is rich, what facilitates its regeneration.

If the Law generalizes "flooding areas", also generalizes any determination of human use possibilities. These differences shows that the use of igapós can promote complete destruction of this environment and, consequently, of the local populations. But in the várzea, for its high fertility, it could be done different management according with its different types to keep the diversity of the species (art. 225, CF), case that the legal constitution allows its exploration (next topic).

So, these aspects show that isn't appropriate to define várzea in Law, as well any other natural event. We do not have none another natural event in Brazil (e.g. volcanos), but citing another more evident example with a natural element, we do not define in law what is "water", but we use its scientific concept to define the forms of water for the society. In the same way, we do not have to legally define várzea for not "plastering" this ecosystem, either for the generality (as it occurred with the Resolution Conama 4/85), either for the excess of details, that can be breake by new researches. The Law must use scientific aspects to prescribe possibilities of human appropriation of the natural resources, but not to define natural events.

The brazilian law defined only one natural event, that was a part of the "várzea de maré", also giving another name: "terreno de marinha" (Decreto 9760/46). With this definition, it entered in field that was unknown and created difficulties to the law efficiency. These "terrenos de marinha" must take into account the line of the average high water of the year of 1831. Studious of ecology they affirm to be of absolute complexity to define with precision this line (LPM) of that time, but the Law keeps this landmark since 1946, although its so difficult application.

Legal Constitution

As shown, várzeas oscillate between a terrestrial phase and another aquatic one. This becomes it adequate to terrestrial and aquatic organisms adapted to these alterations. Specialists of terrestrial systems treat the várzea as a terrestrial ecosystem periodically disturbed by flooding, and the specialists of aquatic systems the opposite. However, the interaction of these two phases is the central function of this system and must be considered in the developed studies (Junk, 1997). The várzea is, therefore, a hybrid system, that involves two distinct phases, but that they are linked and dependents between itself.

In the brazilian Law, in accordance with the Water Law (Decreto 24643/34), várzea is river channel and alluvial soil, but still does not clarify which legal constitution must be applied for these areas. According with Forest Code (Law 4771/65), the areas of permanent preservation (APP) is the forests, on riparian zone, since the higher river channel level (art. 2^{o}, complement

given for Law 7803/89 Law and Medida Provisória 2166-67/01). Therefore, in accordance with *strictu sensu* analysis of the law, the areas that are above of the higher river channel would only be considered APP, and is estimated with this, that everything that is below would be channel river. It would have been the intention of the legislator, fixing the highest level of flooding, to consider APP only the dry land forests? In accordance with Medida Provisória 2166-67/01, the areas of permanent preservation have the "environmental function to preserve the aquatic resources, the landscape, the geologic stability, biodiversity, to protect the soil and to assure well-being of the human population". Following the principle of that the law must be interpreted in way that reaches its final objectives, these functions proposals for the Medida Provisória, also is done by the flooded forests, but these had been excluded from the *strictu sensu* concept of the law, that include only areas beyond the higher river channel. So, is danger to deduce that these areas are out of environmental protection. However, it also seems evident that computed the APP from the higher river channel, the area behind that is not part of the river in the dry season periods, would be obviously in the same legal constitution, therefore are behind of the legal requirement, and therefore, incorporated they. By the way, each year the flood reaches a different point, what it would become impossible to modify the law every year to count the initial APP. For this interpretation, várzea would be also APP, although to have been clearly excluded of the legal definition of APP.

It is, therefore, a problem of legal applicability. The law considers river channel and alluvial soil, but also can be considered APP for being behind of the legal requirements and also to exert the contemplated functions of protection in the APP definition. Like an easy example, the interpreters of the Law try to incase a circle format object (várzea), inside of a squared format object (water), or triangular format object (APP), when in the truth, its format requires a proper hole that has supported all its edges. The Law must create this format to take care of to its peculiarities and to reach its social and environmental function. To define várzea as APP or as water (non-hybrid systems) hinders its adequate management. Várzea is an hybrid system, and must be dealt with differentiated form in accordance with its diverse types (involving until areas of total preservation, in case that necessary), also because the dry land forests management must be different of these flooding areas, therefore the biological structure is sufficiently differentiated. The dry land forests must have receive more strong conservationist treatment than

várzeas, therefore periodically they are not renewed with nutrients directly, and its regeneration is slower. To consider várzea like water or APP would not all be wrong, but would be incomplete, therefore the two phases of this ecosystem (land and water) are linked.

The Water Law (Decree 24643/34) identify that the land use of flooding areas is tolerated by the State for traditional and marginal populations, but gives preference for small proprietors, and this must occur just to attempt to public and social interest, if considered of permanent preservation (Provisional remedy 2166-67/01). It is observed that it has the "tolerated" word, and not "authorized freely" and without control (Vieira, 2000). In the same way, Law 9433/97 (National Politics of Water) identify the importance of the integrated use of the water with the soil and the environmental management as a whole (during the dry season, the areas continue influencing the course of the river). Anyway, it has to take into account the precaution principle in the use of the natural resources, in special for the Amazônia (art. 225, § 4º, Federal Constitution). Including, the displayed legal devices (to APP and flooded areas) also only praise the tolerated use and in special cases. Therefore the use of these areas demands especific ecological studies and there is necessity of the use plan, individual or collective. This is the direction of the SNUC (National System of Conservation Units) in the creation of protecting areas and reaches the principle of the precaution (internationally incorporated to the brazilian enviromental law).

There are norms in the Amazônia indicating the necessity of differentiated uses of the Amazonian forest (as Normative Instructions 3 and 4 of the Ministry of the Environment, both of 04/03/02), and the importance "to improve the legal instruments" to reach sustainable development in different scales of use in the Amazônia. The legal constitution and the domain directly affect the use of these areas, as it will be analyzed.

Domain

Vázea is the riparian area of river channel that are flooded periodically. Therefore, it isn’t possible to deal with várzea, without verifying which waters are overflowing and, consequently, the domain of these waters. All water channel that cross more than one brazilian State are of

federal domain, and “union good” (Federal Constitution, art. 20, III), as well as its riparian zone lands. Therefore, the channel of the Amazonas/Solimões is of federal domain.

The “Decreto-Lei 9760/46”, also considers as real properties of the Union the “terrenos de marinha”, the delinquents of navigable rivers (distance of 15 (fifteen) meters measured horizontally for the part of the land, counted since the camber line of usual floods). Therefore, “várzea” and “várzeas de marés” are Union good, of federal domain. However, some questions need to be detached. When channels that cross just one State touch a channel that cross more than one State when is flooded, how to determine which soils are influenced for federal rivers and which for the state ones? This also varies year the year, and nor always it is possible to see clearly the union of different rivers, as in the meeting of the Black River (State) with Amazon (Federal). In this case, the most appropriate would be to define geographically these limits to define the States and the Union rights and duties of domain. The correct is to create legal instruments that allow participation of both in the decisions of these bordering lines, adjusting the formality of the Law to the necessities of Amazonian ecosystems.

The public goods (as of the Union domain), have characteristics that must be taken in account in eventual regulations of várzea soil use, that concerns to the destination of the good (Gasparini, 1995).

“*Uso comum*” (public easement): are used for any person, but its use must be in agreement the destination of the good. They are inalienable (forbidden of sell, exchange, donation and payment in kind) (Gasparini, 1995). The rivers, seas, roads, streets and squares are examples (Di Pietro, 1997).

“*Uso especial*”: The goods of special use are used by the government in the public services. Also they are inalienable (Gasparini, 1995). The buildings of the service of the government are examples (Di Pietro, 1997).

“*Dominicais*”: these goods are dismissed of any destination, ready to be sell (Gasparini, 1995). They are patrimony of the Union, States and Cities as object of personal law or real of each one of these entities. They are destined to assure incomes to the State, in opposition to others that are affected to a destination of public interest (Di Pietro, 1997).

The water is part of the hybrid system of the várzea, and passed for considerable legal modifications in the last times. According to the Water Law (Decreto 24643/34), it was possible to have public waters and particular waters (disposal in diverse articles). However, with Law 9433/97 (National Politics of Water), all the waters became "uso comum" (easement use) (art. 1º c/c art. 11 and art. 18). This law says clearly that the water is a public good, that the government is not proprietor of the water, but became manager of this good, in the interest of the population, and that the waters are inalienable (Machado, 2002).

However, the "terrenos de marinha" that enclose a band of 33m, are considered "dominical" (Di Pietro, 1997; Gasparini, 1995; Mello, 1995). So, this areas that enclose de "várzea de mare", can be sell. This legal differentiation occurs because law defines this natural event. The Law makes it difficult a joint analysis of environmental protection and social development when it allows the sell of the "terrenos de marinha" because are part of the available patrimony of the Union.

In function of this, it is the question: how to allow the alienation of part of the várzea, knowing that it incorporates the water (that is inalienable) and is part of it and that the new Water Law (9433/97) demands joint performance of soil x water? It clearly seems that, in function of all shown, modifications in law are urgent, therefore the public interest must always prevail on the private one. The "terrenos de marinha" must follow the same legal instruments of use possibilities that the várzea in a general way, also with different managements in accordance with the existing types of várzea.

Várzea: use and common management

It is important to display the main legal instruments of use of these two types of public good: authorization of use, permission of use, concession of use, concession of real right use, Emphyteusis (Mello, 1995; Gasparini, 1995; Di Pietro, 1997. It is necessary to evaluate now what is important in the decision of which instruments to use. As known, the brazilian legislation must standardize the classification of várzea in the "terrenos de marinha" as "uso comum" good (easement good), and extinguish the current differentiation of legal treatment.

Consequently, it is not convenient to use instruments of “dominical” goods, therefore the water is part of the same várzea in the dry season, and the public interest must always prevail on the particular one. Other points need attention and legal revision. The regulations of use on “area” (where it has express determination of the limits allowed for use) are not compatible with the reality of the várzea, therefore its soil changes all year in the flood season, what becomes the legal instruments unable in a so dynamic ecosystem. Contracts of common management of várzea must be done about the cession of resources use, and not it cession of the area where they are inserted. This procedure optimizes the use of the natural resources and prevents litigations every year, with the new differences of the soil caused by flooding.

Moreover, it is possible to make individual and/or collective contracts of use according to the circumstances, depending on which one is better to the social and environmental function. But it must always respecting the legal rule that "presence will be tolerated" and "for marginal and traditional population, with preference to the small “proprietors”. In these contracts must contain activities can be developed and where it scales. To allow the same uses in areas of “chavascal” and “restinga”, for example, would be to condemn the várzea to the exhaustion of its resources. Junk (1997) shows that activities in wide scale in várzea, damage the river channel and promote the weakness of the soil. In any way, either individual or collective, the agreement or contract must use instruments of public easements and they cannot be transferred to another person (*intuitu personae*, even when made to a cooperative or association), and its management must follow clearly the public interest of the environmental protection. The available instruments take care of the necessities of the local populations, and prevent the entrance of large proprietors with the prohibition of the alienation of these areas. Therefore, these flooding areas, in the dry season, are not private; they are public good of “uso comum” with special uses for particular proprietors. It respects the rules of the water legislation and takes care of the necessities of the local traditional population.

Jurisdiction

It competes to the SPU (Union of Patrimony Service) determining the Line of the Average High water (LPM) of 1831 (not determined until today), and also the average of usual floods. In the

same way, it is the SPU that makes the discrimination of properties of the Union and the survey of the occupations to regulation (Decree 9760/46).

However, as shown, it is important to modify the legislation instead of insisting on determining the LPM, and it is necessary also to review the general jurisdictions to optimize the regulation of flood areas use. To INCRA (National Institute of Colonization and Agrarian Reform) competes making the regulation of the agricultural in federal dry land forest (Law 4504/64). For flooding areas, who acts is the SPU (Decree 9760/46).

In any way, it was demonstrated that várzea holds a hybrid system. Therefore, it is advisable that the decisions to be taken in these areas are also argued with the IBAMA (protection agency of the natural resources) and with the National Council of Water Resources. Only with all these entities in the management of várzea, as well as of the participation of the involved population (Law 9433/97), it will be possible to take care of to the determination constitutional of environmental protection and social development in these common properties.

Literature

Aubréville, A. **Étude écologique des principales formations végétales du Brésil et contribution a la connaissance des forêts de l'Amazonie Brésilienne.** Centre Techn. For. Trop. Paris. 268p. 1961.

Ayres, J.M. **As matas de várzea do Mamirauá.** Ed. MCT - CNPq. 123p. 1995.

Di Pietro, M S. Z. **Direito Administrativo.** Atlas: São Paulo. 8ª. ed. 1997. 566p.

Gasparini, D. **Direito Administrativo.** Ed. Saraiva, São Paulo. 1995. 651p.

Junk, W.J. **Flood tolerance and tree distribution in central Amazonian floodplains.** In: Nielsen, L.B.; Nielsen, I.C.; Baslev, H. (Eds.). *Tropical forests: Botanical dynamics, speciation and diversity*. Academic Press, London. p.47-64. 1989.

Junk, W.J. **General Aspects of floodplain ecology with special reference to amazonian floodplains.** In: Ecological Studies, vol.126, *The Central Amazon Floodplain.* Ed. Springer. 1997.

Machado, P. A. L. **Direito ambiental brasileiro.** Malheiros: São Paulo, 10ª. ed. 2002.

Mello, C. A. B. De. **Cursdo de Direito Administrativo.** Malheiros: São Paulo, 10.ed. p. 566-582. 1995.

Prance, G.T. **A terminologia dos tipos de florestas amazônicas sujeitas à inundação.** Acta Amazônica 10(3):495-504. 1980.

Sioli, H. **Studies in amazonian waters.** Atas do Simpósio sobre a Biota Amazônica, Limnologia, 3:9-50. 1967.