Socioecological Economics of Water Development in the Brazilian Amazon: Elements for a Critical Reflection

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Water and Development in the Amazon: Economy, Culture and Socioecology

The Amazon Region is at the forefront of the global controversies over climate change, economic development and environmental justice. One of the main processes of change in the region nowadays is related to the construction of large-scale water projects, particularly for hydroelectricity generation and river navigation (associated with export-oriented agribusiness, timber harvesting and mining). Water infrastructure projects have been built through various forms of public-private association (mostly reliant on public funds and encouragement from governmental institutions) and have invariably caused widespread social, cultural and ecological impacts. Those negative consequences of large water infrastructure schemes reflect the interplay between the pressures for economic growth exerted from the main politico-economic centres and the unique geographical circumstances. Acknowledging the complex and controversial evolution of water management in the Amazon, our intention here is to briefly examine the association between water management, agricultural expansion and hydropower generation as an example of the influential water-agriculture-energy nexus and the failure of conventional mechanisms of water governance. The mobilisation of water resources as a main element of regional development and a mediator of intersectoral relations will be analysed from a critical, interdisciplinary perspective and the overall intention is to contribute to an understanding of the ecological politics associated with water allocation, use and conservation.

The construction of dams and other related water infrastructure schemes, as it has been happening particularly on the Brazilian section (which contains around 60% of the Amazon), is time and again used to propel and celebrate a nation's modernisation, but it also reveals the ontological impurity of modernity, always partial, fraught with gaps and contradictions. Examples of that include the Marathon Dam in Greece, Nehru's dams in India (deviating from Gandhi's opinion about post-colonial development), Roosevelt's dams, navigation and irrigation along the Tennessee Valley as part of New Deal strategies, interconnected hydropower schemes in the Scottish Highlands and dams in the Upper Douro in Portugal, the Aswan Dam in Egypt, among

many others. The contemporary model of water use and management, greatly influenced by the agenda of ecological modernisation and sustainability, comprises a problematic combination of alleged rationality and efficiency gains with the privatisation and degradation of water bodies. Considering this international experience, we will appraise the main direction and the internal contradictions of prevailing development trends in the region. The lived spaces of Brazilian Amazon have been dramatically transformed by sustained migration, new production technologies, urban expansion and new relations of production.

The socioecological economics of water is a privileged entry point into the contemporary problems of development, ecological conservation and socio-environmental justice. The growing interest in the interface between economy and socioecology emerged in the 1990s as part of the 'cultural turn' advocated by social science scholars against the historicist or transhistorical analyses that had so far characterised disciplines such as sociology, economics and human geography. It was a concerted attempt to take seriously the complex relations between meanings and practices that underpin economic relations (Jessop and Oosterlynck, 2008). Socioecological economics has been, for the last 30 years, a key component of the paradigmatic revolutionary struggle against mainstream economic thinking and has entailed, among other things, the rejection of the growth paradigm, a greater unity and integration of knowledge, and the recognition that socio-economic systems are subject to biophysical structures and their law like conditions (Spash, 2020). In that regard, a main strength of a socioecological economic or cultural politico-economic approach is its ability to make sense of the hegemonic agenda of development (as economic growth) and the expansion of extractivist activities without reducing the analysis to merely the economic sphere. This means recognising that there are spaces and interstices in human relationships, notably in the practices of daily life, family traditions and aspirations, that flourish and proliferate beyond the economy. Such line of investigation is concerned with the variety and non-linearity of lived economic experiences, what Mann (2012) calls the 'sidewalk path' dimension that complements the 'main flow' on the street. Culture-sensitive political economy should therefore connect the economic and non-economic elements of world complexity. One central aspect of this debate is how some imaginaries and paradigms are selected in a particular socio-cultural conjuncture to inform policies and state interventions (Sum and Jessop, 2013) with a particular focus on the convergence of discursive, structural, technological and agential mechanisms.

A critical investigation of economic trends that is also, and meaningfully, sensitive to ecological and socio-cultural dimensions should help to restore the weight of identities, discourses, work cultures and the social and cultural embedding of economic action (Sayer, 2001), paying similar attention to the cultural, political and economic dimensions of socioecological processes (Ioris, 2020). Indeed, it has been a major achievement to instigate the integration of culture and

identity into the work of conventional political economy, but what is normally missing in many studies is the wider context of society and the economy, that is, the interconnections and interdependencies between society and the rest of nature. This enhanced politico-economic perspective aims to address this important gap with a focus on both the agency and structure dimensions of water management problems, particularly in relation to the apparatus of the state, which is the central actor of water governance (Mollinga, 2019). The recognition of the importance of culture, however, needs to be closely associated with a fundamental concern for water and environmental justice, not only locally, but nationally and globally. Likewise, the debate about justice needs to reject the economistic view that reduces the question of recognition to a mere epiphenomenon of distribution; in effect, the two – recognition and distribution – are expressions of different moments, but they need to be articulated and theorised together (Fraser and Honneth, 2003). The prominence of recognition complements the conventional emphasis of political economy on redistribution, that is, socioecological economics needs to redress the balance between the multiple and intricate dimensions of lived reality. Recognition, including multiple struggles to assert identity and difference, is a central concept in the world today, in a context of accelerated transcultural contact, whilst distribution has historically been associated with the claims of the working class and the poor during previous phases of capitalist history. Nonetheless, it is not sufficient to suggest the removal of binaries; an accomplished dialectical socioecological reconstruction of economics requires extending the politics of distribution and recognition, with the addition of the resignification of water politics.

This third main theoretical point emphasised above – resignification – is increasingly required to account for the interdependencies between the economic and more-than-economic manifestations of the contradictions of capitalist socioeconomy. Resignification is directly connected with political semiotics, that is, the manifestation of power-relations in different landscapes of meaning in which identities, practices and relations are constructed. Following Butler (2004), resignification needs to be contextualised within the framework of radical democratic theory and associated with resistance and subversive transformation; it means revisiting the meaning of social terms, identities and categories institutionalised and perpetuated through a specific societal value system. Resignification, as well as resistance and transformation, are part of the workings of power and, if properly understood, can lead to a less violent and more inclusive set of practices (Carline, 2006; Paveau, 2019). Therefore, an economics that embraces socioecology and political ecology concerns can offer a better chance to connect the economic responsiveness to culture with the resignification of the interrelated exploitation of society and the rest of nature. Resignification, away from the Western separation between science and ideology, is instrumental in removing the unhelpful cleavages between culture and nature (which intensely characterise

Western culture). For instance, recognising the porousness of cultural boundaries and the positionality of social signs helps to reject the modernist myth of a fixed, passive nature supposedly subordinate to an autonomous, dynamic society (Chandler and Reid, 2019). Likewise, moving beyond the micro-politics of post-structuralism – under the assumption that the specific and local experiences of minorities and marginalised groups retain the moral reservoir that has seemingly been lost in macro-politics and large-scale changes – resignification represents first of all a commitment to reinterpreting and helping to overcome a perverse reality that is systematically reinforced and cuts across nested scales of interaction. Making use of the heuristic category of resignification, critical political approaches have the ability to deal with the politics of nature – that is, supporting politico-ecological approaches – through an investigation into the double exploitation of society and of the rest of nature effected by the expansion of capitalism into new socio-spatial frontiers (Ioris, 2018).

The next sections will briefly consider the historical and geographical evolution of water policies and the formulation of strategies related to dam construction in the region. The intention is to make use of the amplified basis of socioecological economics aforementioned, in particular through the lens of resignification, to offer a commentary on the controversial politico-economic context of water in the Amazon, which has been firmly based on the simplification of socionatural systems according to the powerful discourse of resource exploitation, territorial occupation and economic growth led by the Brazilian State and its powerful economic allies (Ioris, 2010). It is possible to divide the history of dam construction and water infrastructure in the Brazilian Amazon into three politico-economic periods, as follows.

Dam Development in the Amazon: The Time of the Blunt Bulldozer

The above reflections on the need to enhance ecological economics and incorporate both the ecological and sociocultural dimensions of reality suggest that what is required is a more balanced consideration of internal dimensions, that is, giving equal importance to the cultural, the political and the economic components of socioe-cological processes as they are lived and contested by different social groups. This would convert socioecological economics into an even more heuristic approach that can be used to understand water development, as exemplified by the importance of the politics of resignification that underpins dam construction in the Amazon. It will become clear below that the disjuncture between the formal enunciation of water policies in the name of national development and the actual intricacies of their implementation produces a highly unequal distribution of opportunities and gains, which all depend on the affirmation of new meanings and values in the name of national modernisation. The formal and informal evolution of water management has been an integral element of the imposition of hegemonic ideologies and the

mobilisation of labour and resources for the purpose of economic growth. As argued by Reis and Mollinga (2015), what is in place is dialectics of discursivity and materiality. The Amazon region, especially in Brazil, has become a priority for hydropower development in South America. Many large new projects have been put forward and several have already been built, but all have suffered from a lack of transparency, participation, proper risk assessment and convincing economic analysis (revealing the contradictory side of dam construction, even according to mainstream economic reasoning); see, among others, Carvalho (2006), Fearnside (2016); Hanna et al. (2016); McCormick (2011); and Scholz (2005).

The first phase of state-led development in the Amazon Region was the time of the blunt bulldozer, between the 1960s and 1980s, when Brazil was ruled by a military dictatorship that basically worked to preserve conservative interests through a plan of centralised and autocratic modernisation. The incorporation of the Amazon region into technocratic economic plans was a deeply ideological process, formulated in the capital Brasília and encouraged by multilateral financial organisations. (As demonstrated by Buckley (2017), the imaginaries of 'technocrats' and engineers' are probably of the highest importance in shaping policy-making). A major politico-economic vector associated with modernity was the construction of roads; but not just any roads – they had to be motorways of Amazonian proportions. The Transamazon highway, 5,400 kilometres long, intended to ultimately connect the eastern and western sections of South America, was built through the forest and territory that had never been surveyed. The project took only four years and directly benefited from a period of fast economic growth (fuelled by foreign loans, state benevolence and the violent containment of political opposition). New farms began to open in 1966, particularly along the Belém-Brasília highway, the Transamazon highway, the BR-364 highway (Cuiabá–Porto Velho, which attracted more than 160,000 farmers every year during the 1980s) and the BR-163 highway (Cuiabá–Santarém). Settlers were encouraged to open farms in Amazonia not only through fiscal benefits but also by legislation that considered the removal of vegetation as 'improvement' of private property (Ioris, 2016).

Agricultural expansion in Amazonia has produced one of the greatest processes of land privatisation in the history of humanity. It was not only a social tragedy in terms of the loss of common resources and the proletarianisation of local populations, but also an ecological tragedy of planetary proportions. Large agricultural projects, some making use of millions of hectares, were aggressively promoted by the federal government, including through exploratory visits with leading businessmen and state ministers in 1973 (Branford and Glock, 1985). Agricultural colonisation projects along the new roads represented an escape route for desperate farmers and labourers affected by recurrent droughts and structural water access inequalities in the semi-arid Northeast of Brazil. Those coming from the Northeast often met landless groups evicted from the South

Region of Brazil, where agriculture modernisation and latifundia prevented people from having access to land and resources. From an economic perspective, attracting destitute farmers to the region was not a successful policy, given that the settlers had no knowledge of the region, no means and no markets (Ioris, 2017). Many returned to their areas of origin, moved to the cities or into slums along the roads, or found jobs in cattle ranches or plantation farms. The main issue was not the mere physical existence of water and land, but how it was mobilised as a resource according to social structures and politico-economic priorities.

Bulldozers were not only used to build roads, but also to divert rivers and erect dams for hydroelectricity generation. The quest for energy greatly helps to understand how and why the Amazon became increasingly important to national and international economic agendas, but without much regard for local and regional socioecological features. Particularly from the 1960s onwards, the energy sector in Brazil became highly centralised and controlled by an elite group of engineers and economists within the federal government, in cooperation with state administrations (Conca, 2006). Most of the existing hydropower infrastructure in Brazil today was introduced by the military dictatorship, which benefited from the availability of international development money (petrodollars in particular) and the repression of social and political opposition. As a result of coordinated politico-ideological and economic strategies, hydroelectricity provides approximately 65% of the national power generating capacity (Paim et al., 2019; it used to be more than 90%, according to ANEEL, 2008), making the country one of the leading generators of renewable energy in the world (which can be considered a mixed blessing).

The Amazon was not overlooked in the programme of dam construction. A region that makes up 54.4% of Brazilian territory and holds 78% of national freshwater was prioritised by the dictatorial government because of its geography to go through a process of water development (a risky endeavour considering the region's particularities, especially its extensive plains and complex socioecology). The first projects were Coaracy Nunes in Amapá, and Curuá-Una in Pará, but the worst example of wrong-headed choices due to the reckless developmentalist and technocratic ideology was Balbina, near Manaus, a dam that flooded 2,360 km^2 for a very low power generation of only 112.2 MW in average and long periods of low operation due to low water flows (Fearnside, 1989). As observed by the last author, the flat topography and small size of the drainage basin make output small, while vegetation has been left to decompose in the reservoir, resulting in acidic, anoxic water that will corrode the turbines. The project benefited from generous governmental subsidies and was carried out to supply electricity to Manaus, a large and fast growing capital city in the middle of the Amazon that far outpaced the contribution of Balbina.

On its turn, the Samuel dam also has a low efficiency, and the site of the dam is so flat that engineers have had to build 30 miles of dykes to help create a lake of 520 km^2; Samuel has the

capacity to generate 217 MW, which was recognised even before its construction as insufficient to serve the growing cities of Porto Velho and Ji-Parana. Moreover, the largest and most contentious scheme built during this first phase was Tucuruí, which generates electricity particularly for aluminium smelting. Despite the significant level of social and environmental impacts, the decision-making in the case of Tucuruí was practically uninfluenced by environmental studies, which were done concurrently with construction of the scheme (Fearnside, 2001). During the filling of the Tucuruí reservoir, a large area of forest was not cleared and then died, leading to a large release of methane. With the construction of the Tucuruí dam, 2,430 km^2 of forest was flooded and more than 33,000 people (besides the indigenous population) had to be resettled. The scheme also inundated part of three indigenous areas (Parakanã, Pucuruí and Montanha), the effect of which was added to the impact of transmission lines on this land. Many of these problems remain unsolved and were present again during the next phase of dam construction.

The Phase of Politico-Economic Adjustment

The second phase of dam construction was the moment of adjustment, which coincided with the neoliberal reform of the Brazilian state and the rearrangement of national-developmentalism. The contradictions of the state-led model of development – implemented in Brazil during most of the 20th century and intensified by the military governments making use of foreign savings through loans from multilateral banks – resulted in growing economic inefficiencies and reliance on the continuous injection of capital by the state. The military regime ended in 1985 in a context of political discontent, economic instability and great uncertainty. After a turbulent transition, and benefiting from the legitimacy earned since the presidential election of 1989 (the first in 29 years), the historical circumstances were ripe for pro-market reforms and the reorganisation of the state by the new government. But it was the macroeconomic stability and inflation control offered by the Real Plan in 1994 that provided the basis for legal and institutional adjustments. The Cardoso administration (1995-2002) promoted successful monetary and fiscal adjustments, which fuelled an ambitious reform of the state apparatus along the lines of liberalisation and growing integration into global markets.

The Real Plan was complemented by an extensive portfolio of institutional restructuring that included the removal of trade barriers (and at times the promotion of imports to avoid inflation), rigid monetary regulation, adjustments in the labour market and reorientation of the state apparatus. Energy policies and the electric sector were directly affected by the powerful neoliberalising agenda; systematic control of tariffs, widely used during the 1980s to contain inflation, was removed to favour private suppliers and a free energy market. Both generation and commercialisation of energy then became available to private national entrepreneurs, increasingly

associated with international investors or energy companies. Water and environmental regulation were also transformed through the introduction of new legislation directly informed by the doctrine of ecological modernisation (such as the 1997 Water Law, centred on river basin committees, water licences and correspondent charges). In this sense, the water sector offers an emblematic demonstration of the choreography of continuities and changes that affected the economy and state regulation. In particular, the reorientation of government agencies and the introduction of new water legislation paved the way for the expansion of private gains extracted from publicly or collectively owned natural resources (Ioris, 2009).

Because of the changing role of the state apparatus, which increasingly focused on regulation and policy-making rather than direct construction and operation (which nonetheless continued to happen, despite the neoliberal discourse), very few hydropower schemes were built during the second period. Coordination and decision-making became significantly diffused across many agencies, without the presence of a centralised, well-resourced agency as during the military dictatorship. This represented a real tension between ambitious efficiency and operational goals and the reality of institutional fragmentation and diminished investment by the national government (Goldenberg and Prado, 2003). This tension is basically explained by the contrast between the immediate goals of private agents and the long-term demands of wider society. Also, the much-promoted virtues of the open energy market were never translated into investments and coordinated efforts. This culminated in the national energy crisis between June 2001 and March 2002 (by which time energy use was significantly reduced), caused by months of low rainfall, which required energy rationing, which came at a very high political cost (leading to the loss of the 2002 presidential election by Cardoso's political group). According to a National Energy Policy Council technical report (2001), the failure to invest in new dams was responsible for two thirds of energy rationing (Kelman, 2001).

After nearly two decades of reforms, the Brazilian state remains fraught with ambiguities and internal conflicts, which ultimately reflect and incorporate the class-based antagonisms of civil society. The macroeconomic changes have produced winners and losers among the political elite, but to a large extent the direction of Brazilian politics and the overall trends of development continue practically unaltered. The most vivid examples of continuities and path-dependency are the public policies on poverty alleviation and environmental conservation. Despite compensatory measures and expanding environmental regulation, levels of inequality and ecological degradation have remained notably high, ultimately undermining the claims of beneficial economic growth and infrastructure expansion advanced by the national government and hegemonic groups. An examination into institutional reforms in the water sector reveals the complexity of innovation and continuity during the following decade.

Neo-developmentalism, Neo-Liberalisation and Persistent Tensions

The third phase of this schematic analysis of dam construction in the Brazilian Amazon was the period of neo-developmentalism and formalist environmental and socioeconomic regulation that prevailed, at least, until 2016 (followed by extreme right-wing policies of President Temer and, eventually, the turbulent administration inaugurated in 2019). Neo-developmentalism encompassed active fiscal and credit policies, aimed at boosting GDP growth through the control of public spending (in order to secure public sector savings to finance public investment) and the pursuit of hybrid alternatives to both neoliberalism and 'old Latin American developmentalism' associated with import-substitution industrialisation (Morais and Saad-Filho, 2012). Neo-developmentalism in Brazil largely represented the apex of the modernist project to date, as under complex environmental, labour and services legislation there have been sustained attempts to advance a new phase of increasingly large dams through associations between state agencies, construction companies, corporations and politicians. During this third phase, the state revamped a selective programme of infrastructure construction in close alliance with engineering construction companies and local political leaders (an emblematic example was the interbasin project to bring water from the São Francisco River to other catchments in the semi-arid Brazilian Northeast). Despite the mistakes of the past, the threat of hydroelectric exploitation of Amazonia has never been as present on the agenda as in recent years, since the region allegedly holds around 50% of the national potential for electricity generation. Eletrobrás Plan 2010 lists 297 sites suitable for the installation of new plants in the country, of which 79 are located in Amazonia. The main areas for expansion are located on the Madeira River and waters flowing into the Tapajós River, and on the Xingu and Tocantins rivers. In the Madeira Basin, after a lengthy political dispute, the Jirau and Santo Antônio plants were licensed in July 2007, allowing overflow of up to 529 km^2. Project design and implementation were again highly controversial, facing clear opposition from the Bolivian government and environmentalists because of the superficial assessment of impacts, cosmetic implementation of the regulation and sustained influence by politicians and construction companies (Switkes, 2008).

The contentious Belo Monte scheme, which has attracted great attention in the international media, demonstrates how politico-economic trends have persisted while the neoliberalising platform was being adjusted to fulfil neo-developmentalist goals. This represented the resumption of the construction of large hydroelectric power plants by the state apparatus and the encroachment of Brazilian energy demands upon neighbouring nations. Belo Monte was built along the Xingu River (famous for its large indigenous reservation in the upstream section) and is now the fourth biggest on the planet. The Belo Monte project, under another name, was originally

conceived by the military in 1975 (aiming to flood, considering the six planned dams along the Xingu River, a total of 14,500 km^2) but had no chance to go ahead due to the regime's growing financial problems and ultimate collapse. The residents of Altamira (the site of the dam) and local indigenous groups have maintained an organised resistance (although condemnation was not uniform across antagonistic groups) influenced by the traumatic experience of Tucuruí. There was a large gathering in 1989 with more than 1,000 participants, including more than 600 indigenous leaders, which attracted international attention to the dispute and led to the cancellation of a World Bank loan under negotiation (Carvalho, 2006). As a result of the protest, the initial design was changed: the area designated for flooding decreased to 400 km^2 and the name of the dam was changed to Belo Monte.

The project was again modified by the Lula government, elected in 2002, which ironically had as top energy authorities many of those who had opposed this and other similar projects in the past. Capacity and transmission lines were reduced, and the new project removed the large reservoir in order to minimise negative impacts (de Sousa Jr. and Reid, 2010). However, the controversial features of Belo Monte continue to stir protest and serious resistance. The granting of environmental and water licences in 2011, as well as public consultation required for the approval of the project, was notoriously undemocratic and aggressively pushed forward by the federal government under the justification that economic growth required additional sources of energy (Sevá Filho, 2005). A consortium of state-owned companies called Norte Energia won the contract to build Belo Monte and manage it for 35 years. Despite the rationalisation of the engineering design, it would still displace peasants and indigenous tribes, affect river ecology and the water regime. The project was the object of a lengthy battle in the courts, which led to repeated interruptions of its construction and operation (the last interruption ordered by a judge occurred in 2017). Notwithstanding the political struggle, the dam was inaugurated in 2016, with 11,233 MW of installed capacity and at a cost of more than US$ 13 billion. Belo Monte prompted a negotiation with Chinese investors to install an aluminium factory in the region of Barcarena (in the state of Pará) and with the Canadian company Belo Sun to extract gold in the area around the hydropower plant (the environmental licence was granted in March 2017, but critics such as Amazon Watch say that the risks were ignored by the authorities; Poirier, 2017), among other similar projects. Despite all the controversy and the mounting evidence of negative impacts, the last turbine was inaugurated and entered into operation in November 2019 in a ceremony attended by the Brazilian president Bolsonaro, someone who is enthusiastically in favour of a renovated and aggressive agenda of development and socioecological change in the Amazon (Brum, 2019).

The most controversial issue relates to the actual viability of the project without other supporting dams upstream and the inevitable amplification of grave socioecological and socio-

cultural impacts. Due to the long dry season and the resulting long period of low flows in the Xingu River Basin (a common feature of eastern Amazon rivers), Belo Monte has a low operation and economic performance if operating as a single dam. This means that a cascade of dams is necessary, but this would multiply the impacts on indigenous land, natural parks and farms. The national government has guaranteed on many occasions that Belo Monte will be the only large-scale dam on the Xingu River, but the wider problem for Brazilian society is the low level of government legitimacy and eroded trust in public authorities. This is a global phenomenon that seriously impacts on the quality of formal democracy in many countries, Brazil included. Similar reassurances were given in relation to the construction of other schemes in the Amazon, such as the 43 large dams to be implemented, even more controversially, along the even more vulnerable Tapajós River by 2022 (Fearnside, 2015). Those dams are directly benefiting from lenient interpretation of the legislation and lax enforcement of water and environmental regulations, and the result is that several indigenous reserves and conservation areas will be flooded and degraded. The insistence on the construction of those dams reveals the incompatibilities between public policies (stemming from an authoritarian model of governance by the electrical sector, construction companies and private industries), but also the creative and persistent resistance of indigenous peoples and other groups advocating for defence of their territories, livelihoods and culture (Alarcon et al., 2016). For many activists and local communities there is a distinct feeling of betrayal and deception, especially because of the surprising new alliances formed between elected left-wing politicians (the Lula-Dilma administration between 2003-2016) and the more traditional, oligarchic economic players (Melo, 2016). "The betrayal is hard to understand. But time doesn't care if you understand" (Diversi, 2014: 243).

The construction of new dams has many ramifications, which multiply the repercussions of corruption beyond the mere appropriation of public funds. The most significant is the connection between dams and agribusiness, which highlights the importance of the resignification dimension of socioecological economics. One key example of this is that the new dams will allow large-scale barges to pass rapids and cross waterfalls, which will significantly reduce transport costs to ports along the Amazon River, making them accessible to transcontinental transportation ships, and ultimately increasing the profitability of soybean cultivation and the areas available for such production (Fearnside, 2015). Justification for the new hydropower schemes seems to be less about energy generation and more about the creation of new navigation routes. At face value, it seems that there is great potential in the expansion of river navigation, considering that this currently only accounts for 4% of domestic Brazilian trade, but it is almost certain that navigation plans will follow speculation and financialisation pressures, leading to chaotic migration and deforestation (Becker, 2012). The growing politico-economic importance of agribusiness in Brazil is directly connected

with the challenges of water management and Amazon development. The sector is commonly considered a great Brazilian achievement, due to technological improvements and production growth, but it is also responsible for ecosystem degradation, contamination of water reserves, socio-spatial inequalities and macroeconomic vulnerability (Ioris, 2015). As the agribusiness sector has been unable to resolve long-lasting problems such as economic development that benefit small groups of large-scale landowners, commercial companies and transnational corporations, with wider society paying the price in the form of mounting environmental and social impacts.

Conclusions

The large-scale incorporation of water into economic development strategies, as schematically examined above, demonstrates the persistent and systematic advance of modernity in the Brazilian Amazon. It has been a phenomenon of epic proportions, involving both material and structural transformations of ecosystems, communities, lifestyles and socioeconomic arrangements. In that context, a critical and improved politico-economic approach can be instrumental for the investigation of the controversial and contradictory basis of regional development and water management. Among many positive attributes, socioecological economics can help us to understand the impact of mainstream developmental ideologies and associated discourses, as well as to comprehend the complexity of the interface between economic and more-than-economic practices. The main conclusion here is that the examination of problems and the search for alternatives requires the proper resignification of ongoing economic trends and the range of socioecological issues involved. The resignification of the knowledge and techniques of traditional regional groups, such as riparian communities and indigenous peoples, could be an important point of departure and be an integral element of the critique of hegemonic water development and dam construction, beyond the perspective of official bureaucrats and businesspeople prevents them from taking the real circumstances of these populations into account with regard to public policies and water management in particular.

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