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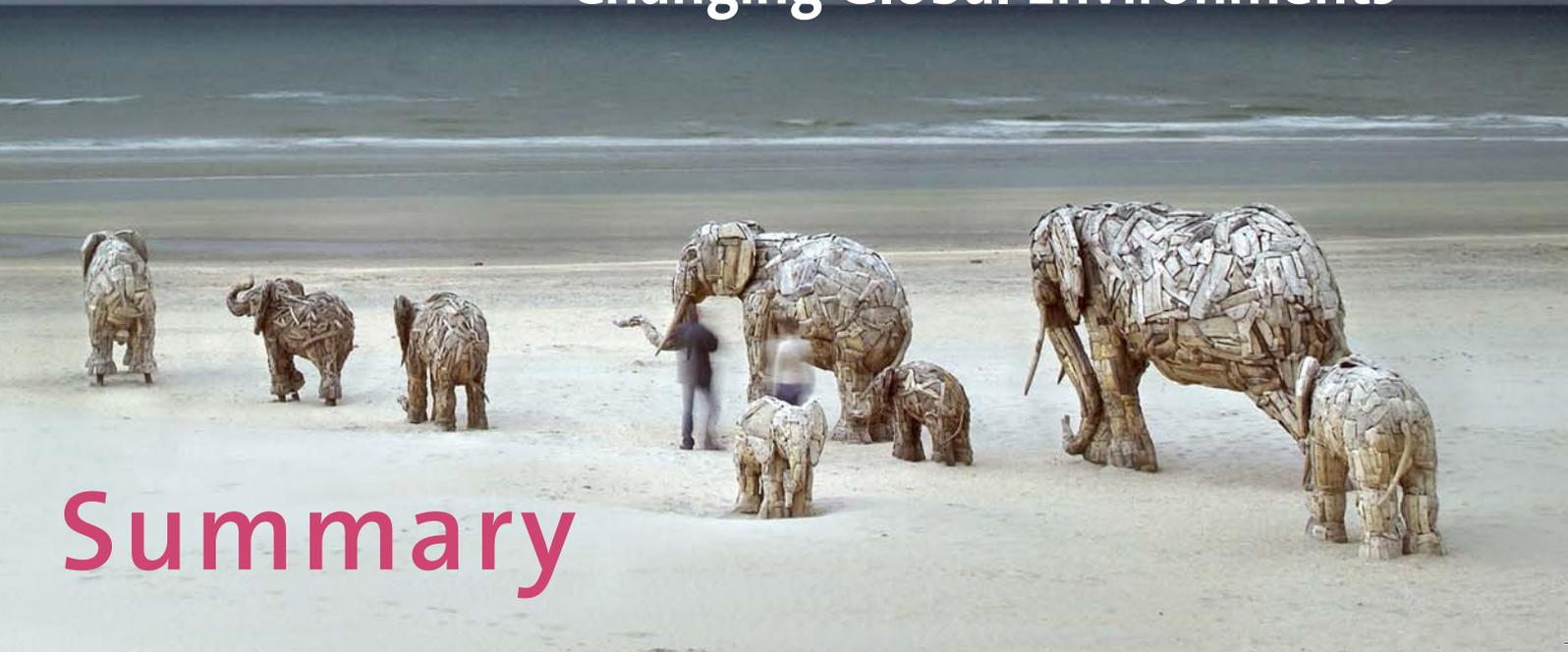
international social science council

# World Social Science Report

**2013**

**Changing Global Environments**

**Summary**





## Part 6

# New approaches to governance and decision-making

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## 70. Dealing with wicked environmental problems: Introduction to Part 6

by

Diana Feliciano and Frans Berkhout

*This section presents key debates about environmental governance and decision-making. Wicked problems become more pressing to resolve as the pace and scale of global environmental challenges and the underlying social problems become more apparent. The contributions examine the role of the social sciences and other types of knowledge in the governance of environmental change and sustainability.*

**H**ow shall we govern the distribution of risks and benefits arising from global environmental change? How do we best reduce the causes of risk and hazard, while enabling groups and societies to pursue more sustainable development paths? And how do we protect the interests of those suffering the impacts but not the benefits of resource use? The question of how societies manage (or fail to manage) this imbalance between private goods and public “bads” forms the central problem for environmental and sustainability governance.

Over time, sustainability governance issues have expanded from the local, tangible and immediate (urban water pollution) to the distant, intangible and delayed (stratospheric ozone depletion and climate change). Such complex, systemic problems, which are always imperfectly understood and have no easy solutions, are characterized as “wicked problems” (Rittel and Webber, 1973).

Some contributions address the challenge of co-design and co-production of knowledge and policy; others question where decision-making power should reside for problems that are at once local, regional and even global; and a third group address the conundrum by which the scope, scale and speed of governance may not match the pace and complexity of environmental change. This threatens to leave us with inadequate and incremental responses, when transformative change is needed.

### **Co-design and co-production of knowledge and policy**

The natural sciences, and increasingly too the social sciences, have played an important role in defining sustainability problems and risks at all scales. Yet science alone cannot adequately define all sustainability problems or provide solutions to them, partly because

they mean different things to different people, and neither does it have universally accepted legitimacy for doing so. One way of making the knowledge claims underpinning environmental governance more salient and legitimate has been to pay greater attention to the co-production of knowledge by the users and producers of knowledge claims.

The co-design and co-production of science and policy call for new procedures. They need to be undertaken in ways that facilitate the production of robust knowledge claims, while supporting mutual learning and problem-solving (see Tàbara, Part II). More attention needs to be focused on the learning benefits of these processes in different social settings. For this to be assured, effective leadership and adequate resources in the facilitation of inclusive and participatory processes are essential.

On this first theme, several authors contribute insights. Beck asks whether the Intergovernmental Panel on Climate Change (IPCC) has proven to be effective in enabling learning at the science–policy interface. Since its inception, the IPCC and similar global assessments have been influential in the international political process. Within the scientific community, the IPCC is seen as a model for successful work at the boundary between science and policy. This has increased public scrutiny of its activities, leading to strong critiques of the procedures it has adopted to secure scientific quality and internal transparency. But questions of public trust and expert credibility remain. These are serious challenges for science, particularly when there are increasing calls for more open knowledge systems and the democratisation of science amidst great cultural uncertainty and anxiety about the future. For Guimarães, who reflects on failures in translating international environmental agreements into action, the lens of politics shows the tenuous linkages between science, public debate, policy and practice, as well as the defining role that power and economic interests play in facilitating or impeding knowledge claims in policy debates.

Lavell, Brenes and Girot present the successful case of a network for the study of disaster prevention and management, LA RED,<sup>1</sup> in Latin America, which has helped establish an understanding of the social construction of disaster risk in science, policy and public awareness. Community resilience in the face of extreme events and disasters is based on the social capital and community identity that exists and how it can be rebuilt in the period of recovery after a disaster. While much progress in research and policy has been made in Latin America, Fra Paleo argues that the experience of major disasters elsewhere in the 20th and 21st centuries (such as the Chernobyl nuclear disaster in Ukraine and Hurricane Katrina in the United States) has not yet been translated into effective risk-management strategies by policy makers in these regions.

In engaging with public debates about climate and environmental change, science and scientists have become entangled in social controversies. Disagreement is fed by the complexity of the causal mechanisms involved and by a lack of consensus about the scientific evidence base for many of these problems and their solutions. Other sources of knowledge and experience are essential for sense making and action by citizens and policy makers. These might include knowledge systems embedded in the cultural traditions of indigenous, traditional or local communities. Evidence from conventional natural and social science complements these other forms of knowledge in understanding and responding to environmental change. Sanchez and Reusser emphasise that both natural and social scientists need to use and integrate available scientific evidence on global environmental change to propose a set of practicable solutions to the pressing questions.

Several authors underline the importance of indigenous knowledge and local communities in the co-design of research and policy. In the cases presented, local communities are increasingly involved in joint investigations with social and natural scientists to analyse and respond to climate change. Srang-iam and Borja describe successful cases where the integration of indigenous knowledge in research and policy-making has taken place. Rajão, Godwin and Jordan recommend taking indigenous knowledge into account in the design of Amazonian environmental policies, in the development of adaptation programmes in Nigeria, and in natural resource management policies in Canada respectively. In the Mercosur<sup>2</sup> countries, policies that engage citizens in water management are proving effective by building on the local knowledge and interests of stakeholders (Gugliano and Carbonai).

While the state has traditionally been seen as the guarantor of public and collective goods, there is now a growing role for the private sector, civil society, citizens and consumers. This shift from government to governance is important for social science's understanding of who governs and how governance happens. As the role of government is redefined, there are new practical questions about how the vitality and capacity of other groups in society can be aligned and coordinated to achieve sustainability goals, while ensuring openness and equity in the distribution of environmental goods and bads.

### **Combining top-down and bottom-up decision-making processes**

Top-down decision-making processes often fail because they are ignorant of realities on the ground and are not sensitive to local capabilities, perceptions and interests. Bottom-up, participatory approaches, by contrast, are intended to lead to legitimate and effective decisions, but can get stuck because they do not have the power, legitimacy or scope needed to achieve change. This dichotomy has become particularly acute in the context of sustainability. Many sustainability problems and solutions span different scales of governance. It remains a challenge to find the right combination of top-down and bottom-up governance, along with public, private and public-private arrangements appropriate to go with them. The problem is especially acute at a time when the focus is on learning and adaptation in the face of uncertainty.

In addition, the increasingly regional and global character of many environmental problems intensifies the need for political and economic coordination to manage global change. International coordination of nation states through treaties requires very different institutions, capabilities and instruments from the management of local commons. This is made even more difficult in regions already experiencing political tensions or even military conflicts. Jagerskog gives the example of three states in the Jordan River basin (Israel, Palestine and Jordan) where ongoing conflicts are undermining cooperation in transboundary water management, and the just and equitable sharing of resources.

Non-governmental organisations and social movements are crucial actors in governance through their roles in influencing the policy agenda, raising public consciousness about the management of environmental problems, monitoring environmental quality, and exposing bad government and corporate practices (Martinelli). Grassroots organisations have repeatedly called attention to climate change hazards, and have shown that they are linked to the erosion of social and economic rights. For social movements, there are opportunities to use international law and governance to turn emerging economic, legal and cultural norms toward creating climate justice (Ioris). An example of the creation of justice from

bottom-up decision-making processes is given by Sood. Indian national policies aimed at protecting informal workers, for example in the reuse and recycling sector in urban areas, have not been implemented successfully because of a fragmentation of national and city-level jurisdictions. In Pune, India, a city-level initiative called Solid Waste Collection and Handling emerged to ensure that informal workers are less exposed to health and safety risks in waste handling and collection.

### **Incremental versus transformative change**

The final challenge taken up in this chapter concerns the pace and scope of governance. Many social organizations, including governments, favour incremental changes. But many of the greatest challenges now call for a more fundamental and far-reaching transformation of social systems (see also Parts III and IV).

The prospect of global environmental change associated with major long-term risks has generated a new debate about how to stimulate, and govern, radical social and economic transformations over the longer term. According to Brand, Brunnengraber and colleagues, social science can contribute to our understanding of crisis strategies, normative perceptions, and profound societal changes from the local to the global scale. This can help strengthen the possibility of an intentional and consensual transformation towards low-carbon, sustainable and just societies (see Part VI).

### **Conclusion: Struggling and negotiating together**

Much remains to be explored and learned about how to govern global environmental change and deal with its social consequences. As Future Earth gets underway, the co-design and co-production of knowledge is a central design feature of the new research programme. Those searching for adequate and acceptable responses to global environmental change the world over are struggling to find new forms of governance that engage interested parties appropriately and effectively while avoiding fatigue, stalemate and disenfranchisement. Understanding how to encourage radical novelty (see Miller, Part II), remove obstacles to transformation, dismantle old systems, and create and embed new, more sustainable forms of provision (see Sachs, Part II) is a huge research and social challenge. While much is to be learned from history, transformative change is not easily understood and shaped while society is in the midst of it. Barriers to transformative change include uncertainties about global environmental change, the high costs of transformational actions, and institutional and behavioural inertia that tend to maintain the incumbent resource systems and policies.

### **Notes**

1. Red de Cambio Climático y Gestión del Riesgo de Desastres (Network for Climate Change and Management of Disaster Risk).
2. *Mercado Común del Sur* (Southern Common Market). Economic and political agreement between Argentina, Brazil, Paraguay, Uruguay and Venezuela. Bolivia, Chile, Colombia, Ecuador, and Peru are associate members; Mexico and New Zealand are observers.

**Bibliography**

Rittel, H. W. J. and M. M. Webber (1973), "Dilemmas in a general theory of planning", *Policy Science*, Vol. 4, pp. 155-169, [http://www.uctc.net/mwebber/Rittel+Webber+Dilemmas+General\\_Theory\\_of\\_Planning.pdf](http://www.uctc.net/mwebber/Rittel+Webber+Dilemmas+General_Theory_of_Planning.pdf)

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## 78. Fighting to include local voices in environmental policy making in Brazil

by  
Raoni Rajão

*Local voices and opinions are seen as important in formulating environmental policies, but in reality oral accounts, metaphors and symbols play only a marginal role, while scientific representations still dominate. This problem is deeply rooted in governance discourses that value satellite imagery and other scientific data above local views and experience. This paper focuses on policy-making in Brazil in relation to deforestation in the Amazon rainforest.*

### Introduction

The entities involved in formulating environmental policies, such as land, people, pollution and biodiversity, cannot be physically present at the discussion. In facing this challenge, policy processes need to create and use representations – words, utterances, symbols or images – to stand in for what cannot be brought into the room (Brown, 2009). Historically, the task of creating representations in environmental policy making has largely been left to scientists (Peet and Watts, 1996). Re-evaluating indigenous and other forms of local knowledge to construct effective environmental governance systems has been an important social science contribution to policy debates in recent decades (Agrawal, 1995; Harris et al., 1995). But despite the recognised need for these contributions, local representations still play only an insignificant role in formulating and enforcing environmental policies.

This article aims to explore the challenges involved in including local representations of reality in environmental policy making. It does so by examining the relation between satellite imagery – as a type of scientific representation – and local accounts of deforestation in formulating environmental policies in the Brazilian Amazon rainforest. In order to capture this relation, this article pays particular attention to the governmental discourses that policy makers and scientists in Brazil use.

Michel Foucault suggested that discourses are statements that “define, describe, and delimit what is possible to say and not possible to say (and by extension—what to do or not to do)” (Hajer, 1995; Kress, 1985: 7). This implies that in a specific policy context, only the

statements that conform with established discourses are deemed “truthful”. Representations rely on the dominant discourses to become valid, while the representations that do not fit are silenced (Foucault, 2002). By expanding the understanding of how the state uses discourses, Foucault proposed the notion of governmentality: that is, “the ensemble formed by institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of this very specific, albeit very complex, power” (Foucault, 2007: 144).

The characterisation of a specific governmentality and the delineation of its relationship to different discourses and representations are not trivial tasks. They often require the adoption of different research methods. The data for this analysis come from textual sources (such as news articles, government reports, historical accounts and scientific studies) and from 85 interviews conducted with governmental officials, scientists and local groups in Brazil between June 2007 and August 2009. The next section of this article outlines the main finding of the study (for a more extensive version of this chapter see Rajão, 2012).

### Governmental discourses and representations

The 1980s was an intense period for environmental activism in the Amazon. An alliance between grassroots movements, scientists, politicians, journalists and celebrities made globally important an issue which had previously been largely invisible. Local representations of deforestation led the activism. Examples include striking images of burned fields and the voices of prominent local activists such as the Indian chief Raoni Metuktire and the rubber tapper Chico Mendes. Three decades later, the situation could not be more different. Instead of local representations, distant and objective assessments in the form of satellite images, maps and graphs now dominate news reports and policy documents. This prompts us to question why representations of the Amazon featuring local voices and images have been sidelined in recent decades in favour of remotely sensed and numeric representations.

We have examined the ways in which policy makers referred to local and scientific representations in their discourses. It emerges that governance in Brazil reflects partially overlapping discourses that shape the relationship between representation and policy making.

Within the Brazilian government, the first discourse that helps explain the diffusion of scientific representations at the cost of local ones can be defined as the visibility discourse. This discourse is dominated by policy makers’ pronouncements which privilege the sense of sight over other ways of representing and knowing the Amazon. It incorporates the idea that it is crucial to “see” the territory in order to govern it. The influence of the visibility discourse are particularly evident when we consider that government officials disqualified the nonvisual local representation of the Amazon after the introduction of satellite-based remote sensing technology.

The local inhabitants of the Amazon have for centuries found ways to represent their territory through the use of oral accounts that highlight the characteristics of the landscape as they see and live it. For instance, while referring to the scarcity of bush meat in nearby forests and the location of his current hunting grounds, a native Indian would use references such as the names of rivers (such as Rio do Sangue, Blood River), aspects of the landscape (such as *mata fechada*, dense forest) and talk about distances in terms of

walking days. Nonetheless, policy makers and scientists insist that only with the arrival of satellite imagery has the Amazon became knowable. Pereira (1971) commented that the use of remote sensing technology in the Amazon was essential for “separating the legend from reality [...and revealing] the secrets that nobody knows”. It is possible that Brazilian policy makers excluded local representations not because of their inability to represent the territory, but because they conflict with a visibility discourse that seeks favour the government. This aims to know and control the Amazon in a centralised way, without the need for local, background knowledge that would otherwise be required to interpret local, culturally bound representations.

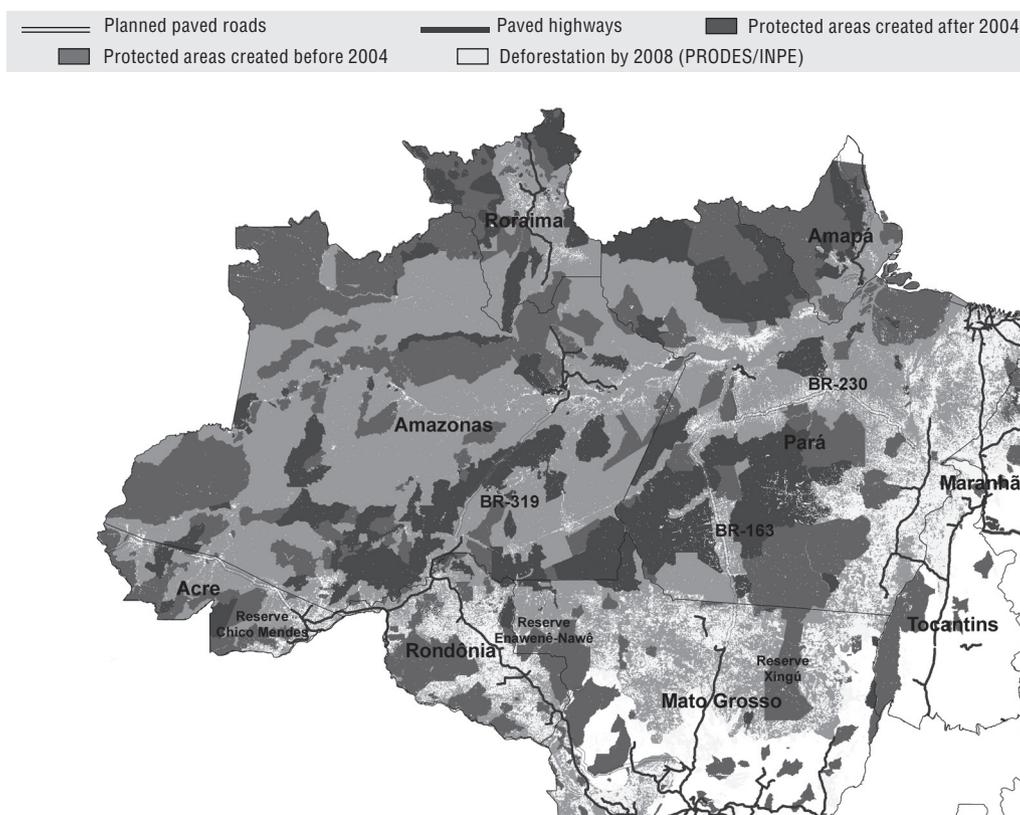
The perceived importance of a comprehensive understanding of the territory reveals another way in which scientific representation is valued above local representation. The so-called comprehensiveness discourse describes the tendency of officials and scientists to refer to the entire legal entity of the Amazon, the largest socio-geographic division of Brazil, rather than to specific areas or populations. In addition, despite recent efforts to allow state governments to get involved, key policy decisions concerning the Amazon are still made by the federal government, in a way that tends to treat the region as a homogeneous whole. Here, scientific representations such as satellite images play a key role due to their ability to show the entire picture, while local representations are sidelined for their limited geographical range.

During the 1970s and 1980s, local representations helped create protected areas (see below), yet they were unable to stop the expansion of Brazilian colonisation policies in the early 1980s. This may be because they only focused on deforestation in a restricted portion of the Amazon. Policy makers and scientists consequently dismissed the relevance of these representations by claiming that they were “speculative [...] excessive and misdirected” (Clayton, 1982: 2). They did not feel a need to change policies that applied to the whole of the Amazon.

A third discourse that helps explain the success of satellite technology and related scientific representations in Brazil concerns the search for deterministic statements, representations that can simultaneously explain reality and mathematically control the outcome of policies. This we term the determinacy discourse. It was evident in the importance that policy makers have attached to mathematical models that could generate future deforestation scenarios for the Amazon. The positivist underpinnings of scientific representation match the deterministic discourse closely, whereas local representations mostly rely on contextual and experience-based presumptions about the future. So they are deemed unfit, and excluded from policy making.

This helps explain why prediction models that promise specific results in terms of reducing deforestation (see Figure 78.1) have increasingly guided the creation of new protected areas since 2004, rather than demands from local groups based on oral accounts of the cultural significance of the territory. An ex-director of the Ministry of the Environment has suggested that local representations were often used only to justify a decision that had already been taken, based mainly on deterministic representations of satellite images and mathematical models.

Figure 78.1 **Map showing deforestation patterns, main roads and protected areas in the Amazon. It illustrates the ability of scientific representations to provide visual, comprehensive and deterministic accounts of the Amazon.**



Source: Rajao 2013

## Conclusion

To include local representations in environmental policy making, we must be ready to challenge some of the assumptions embedded in current government practices. An intervention can only be successful if it is aimed at revaluing local representations. It should challenge not only the inherent superiority of science, but also the discourses that support the exclusive use of scientific representations. To position local representations at the heart of environmental policy making, we need to challenge the discourses of visibility, comprehensibility and determinacy that undermine their legitimacy.

It is therefore important to go beyond the “seeing is believing” attitude that is typical of current evidence-based approaches to policy making. The accounts of the people who face environmental problems directly should also be accepted as valid. This implies the adoption of participatory approaches and the creation of a new form of governmentality that acknowledges the validity of different epistemologies in environmental policy making.

It should also be possible to challenge the idea that the “whole” is the only scale on which valid environmental policies can be created. This implies abandoning large-scale and top-down approaches to policy making. Decentralised governance systems should allow local groups the autonomy to set priorities and regulate their

relationship with the environment. The idea that environmental policies should always be deterministic should also be challenged. Governments need to accept the unruly nature of environmental problems, and create solutions in an inclusive, experimental and emerging manner.

### **Bibliography**

- Agrawal, A. (1995), "Dismantling the divide between indigenous and scientific knowledge", *Development and Change*, Vol. 26/3, pp. 413-430, <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-7660.1995.tb00560.x/abstract>.
- Brown, M. B. (2009), *Science in Democracy: Expertise, Institutions, and Representation*, MIT Press, Cambridge, Mass.
- Clayton, H. (1982), "Fears for tropical forest 'excessive'", *The Times*, 15 June, p. 2.
- Foucault, M. (2002), *The Order of Things: An Archeology of the Human Sciences*, Routledge, London.
- Foucault, M. (2007), *Security, Territory, Population: Lectures at the Collège de France, 1977-1978*, Palgrave Macmillan, New York.
- Hajer, M. A. (1995), *The Politics of Environmental Discourse: Ecological Modernization and The Policy Process*, Oxford University Press, Oxford.
- Harris, T. M. et al. (1995), "Pursuing social goals through participatory GIS: Redressing South Africa's historical political ecology", in Pickles, J. (ed.), *Ground Truth: The Social Implications of Geographic Information Systems*, Guilford Press, New York.
- Kress, G. (1985), *Linguistic Processes in Sociocultural Practice*, Oxford University Press, Oxford.
- Peet, R. and M. Watts (eds.) (1996), *Liberation Ecologies : Environment, Development, Social Movements*, Routledge, London.
- Pereira, O. D. (1971), *A Transamazônica: prós e contras*, Editora Civilização Brasileira, Rio de Janeiro.
- Rajão, R. (2013), Representations and discourses: The role of local accounts and remote sensing in the formulation of Amazonia's environmental policy, *Environmental Science & Policy*, Vol. 30, p60-71.

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