

## Comment

### **BRIDGING THE GAP BETWEEN SCIENCE AND POLICY: THE IMPORTANCE OF MUTUAL RESPECT, TRUST AND THE ROLE OF MEDIATORS**

## **Science and policy-making in Brazil: some strategies for dialogue**

**Teresa da Silva Rosa, Maria José Teixeira Carneiro**

*ABSTRACT: The current work aims to present and discuss some results of our studies on the communication between those responsible for setting up public, environmental policies and the Brazilian scientific community. These researches focus on the use of knowledge, mostly scientific knowledge, related to two environmental issues: the conservation of biodiversity and climate change. We have observed that there is a difficult dialogue between the various parties involved in the environmental governance. In addition, most strategies are not institutionalised and are implemented in an attempt to facilitate communication between them.*

First of all, it may be worth considering that Brazil is a very large country, with a great biological diversity related to the various biomes existing within its borders. It has an active international community working in different scientific fields and has an economy with a vibrant consumer market and considerable agricultural and industrial output, which attracts foreign investments as well as large multinational companies. However, all this (still) has to coexist alongside high levels of socio-economic inequality which leaves most of its population exposed to socio-environmental vulnerability. Therefore, we will be dealing with the dialogue between science and policy makers within a complex context.

We have observed and concluded from our researches that there is a difficult dialogue between the various actors involved in environmental governance. In addition, most strategies are not institutionalised and are implemented in an attempt to facilitate dialogue and communication between them. The current work aims to present and discuss some of the experiences observed during the course of our studies. These strategies aim to facilitate communication, in particular between those responsible for setting up public, environmental policies and the Brazilian scientific community. As mentioned later, sometimes these strategies are mediated by actors taking a more transversal action, such as a “Science communicator”. Our view, therefore, is based on the research carried out since 2007 by two research groups – CINAIS/UFRRJ and NEUS/UVV-ES. Their researches focus on the use of knowledge, mostly scientific knowledge, related to two environmental issues: the conservation of biodiversity and climate change. Regardless of how important these issues are nowadays, we chose this topic because Brazil has taken on responsibilities in the international arena, and as a consequence it has to fulfil them internally by adopting public policies.

Our studies indicate that there is little institutionalised use of knowledge or scientific evidence with reference to environmental issues, as opposed to what seems to be happening in other countries, especially within the European Union and in the United States. Criticism has been raised with regards to the fact that policies are becoming more scientific, implying that society should question more about the role of science and on the forms of mediation that contribute to the integration of scientific knowledge into the process of setting up policies.<sup>1</sup> This criticism leads us to the issue of how effective State actions may be, particularly in terms of environmental governance.

In Brazil, the non-institutionalised use of scientific knowledge contributes to make communication between science and policy-making difficult. In this regard, we would like to mention the difficult integration (mainstreaming) process of strategies to conserve biodiversity and to adapt to extreme events or to mitigate emissions in policies related to specific fields. This is having an impact on a more effective and coordinated state action with regards to socio-environmental issues. Very often, it results in the

coexistence of environmental policies with development policies, which, for instance, hardly take into account the socio-environmental sustainability of what is being deployed. In other words, within the same State there is some difficulty in the communication within the public sector, which is mainly caused by economic priorities related to the type of development chosen.

However, this does not necessarily mean that the dialogue between civil society in general (including scientists) and the decision makers is unlikely to occur. There seems to have been more attention on some topics in the last few years, which is raising awareness within society as a whole. Examples may be found in the use of transgenic seeds in agriculture, voting for the amendment of the Brazilian Forest Code, or the construction of Belo Monte power plant in the heart of the Amazon, impacting on biodiversity and on the traditional communities located there. Other topics remain confined to a debate which involves inhabitants of certain areas being affected by a distinctive environmental measure, for instance, the creation of conservation areas in territories dedicated to economic activities. An example may be found in the establishment of parks and areas for the protection of the Atlantic Forest biome, located on the country's Atlantic coast. This area has a mega biodiversity which, over time, has been affected by human occupation marked by the destruction of local biomes.

One of our studies has shown that climate does not seem to be an issue for the vulnerable people who were interviewed despite the fact that they had already heard about climate change – which is different from having knowledge of it. This “lack of interest” might distance them from debates on this topic. In this case, the mobilisation for a debate on this topic is still restricted to a group which includes actors like NGOs, scientists and some businesses. The latter mainly being involved because of the mitigation of greenhouse gas emissions.

Finally, the dialogue between various social actors within the context of environmental governance is still to be exploited in Brazil, despite the criticism which may be raised with regard to the use of scientific knowledge as the main basis for political decisions. As a reflection on communication, environmental governance, along with scientists and the State, indicate that there are actors who have interests and can affect what may be said or done.<sup>2</sup> Considering that environmental governance presents this diversity, what needs to be taken into account in the dialogue between science and policy makers is that the decision-making power is not defined by the modern conditions of state. Implementing environmental governance is the result of an interaction among various social actors who **cooperate aiming the effectiveness of consensus political actions**.<sup>3</sup> This, however, might make the process of setting up policies and the communication between science and policy makers more complex.

At least two points are worth clarifying. Firstly, we are aware that scientific knowledge is produced within a certain ideological framework – the framework of Modernity. Not mentioning some characteristics as objectivity, neutrality and the infallibility of knowledge, modern science is disciplinary, and its main priorities are its branches of knowledge and the understanding of a fragmented reality. By doing so, it does not take into account the various relationships existing between multiple dimensions of reality.<sup>4,5</sup> The knowledge of the environmental area – the environmental knowledge – requires scientists and projects to take a more integrated, interdisciplinary perspective,<sup>6</sup> in order to comprehend the complexity of reality, in particular of problems posed by environmental crisis.

As a result of research funded by supporting agencies, this scientific knowledge is not the only one which may be accessed by policies. There is also scientific knowledge produced by other actors other than the scientific community. It is worth focusing on the knowledge of native communities, which, therefore, is not produced by science. Cunha<sup>7</sup> claims that as well as the scientific knowledge, the traditional knowledge, tries to understand reality, through its own processes of research, in order to action on it. Being intrinsically more local than the universalism of scientific knowledge, this type of knowledge is able to enrich the decision-making process thanks to information provided by communities living along the Atlantic coast (*caiçaras*), small farms, *quilombolas* (communities whose members are African slaves descendants) indigenous people, and others. The taking into account of this type of knowledge may be justified by the diversity of its actors due to its governance, and it raises the issue about the hegemonic role of science.

Both aspects lead us to what was claimed by Boaventura de Souza Santos to be the “crisis of the deterioration of science”, whereby some areas of modern science would lead to post-modern science.<sup>8</sup> According to this author, the latter is part of a movement striving to avoid the dogmatisation of science, which is known for the distancing from the positivist paradigms, which are at the basis of the scientific exploration of nature.

Even considering these points, nothing invalidates the use of scientific knowledge by decision makers. Bearing this in mind, what opportunities are being created or what strategies are being set up to facilitate communication between scientists and decision makers about the conservation of biodiversity and climate change?

Given that in Brazil there is no institutionalised use of scientific knowledge by decision makers responsible for environmental public policies, some strategies are set up on a case by case basis. This way helps, or mediates between, both the decision makers, willing to obtain information to better support their positions, and the researchers who hold the knowledge the decision makers are interested in.

Some characteristics related to the field of politics may interfere with the use of science. Often, decision makers have tight deadlines by which to establish the **measure statements of a measure**.<sup>9</sup> In this case, we are aware that accessing information and articles which may influence the decision making process requires more time. The ideal scenario would be that of mapping or having already mapped the scientific literature related to the measure which is in the process of being designed. This leaves us with a problem related to the setting up of policies, which may be resolved, for instance, by creating bibliography platforms or centres able to carry out this type of mapping on the basis of specific topics or issues.

In Brazil, there are at least two cases about biodiversity which are worth mentioning. Firstly, the Portal of the Research Programme in Biodiversity (Portal do Programa de Pesquisa em Biodiversidade/PPBio - <http://ppbio.inpa.gov.br/>), of the National Research Institute of the Amazon (Instituto Nacional de Pesquisas Amazona /INPA). This portal aims to disseminate the research results obtained in its centres, which mainly focuses on the Brazilian biodiversity. By doing so, this knowledge may be accessed and used by various actors – scientists, public policy makers and professionals who work in the field of environmental management and education. Knowledge is disseminated through repositories of primary metadata, like the Repository of Data of Environmental Studies (Repositório de Dados de Estudos Ecológicos), or through publications like articles, books, PhD theses and Masters dissertations, and videos made thanks to the studies conducted by researchers who use the structure of PPBio in their research.

The other platform is that of Portal BHL Scielo (<http://www.bhlscielo.org/>) which, by integrating the global network of The Biodiversity Heritage Library (BHL), aims to contribute to the publication, the access and interoperability of scientific data on biodiversity. It offers free access to technical and scientific literature, including works, articles, maps, historical documents and legislation about the Brazilian biodiversity on topics like environmental science, ecosystems, environmental impact and the conservation of nature.

Although it does not focus on any of the environmental topics dealt with in this article, we would like to mention some Brazilian cases of scientific information dissemination. For instance, the Scielo/Scientific Electronic Library Online (<http://www.scielo.org/php/index.php>) offers free access to scientific journals selected and assessed by a national committee according to its own criteria, and whose main purpose is that of contributing to a larger use of these resources. As scientific knowledge, including fields like health and social sciences, is now also being made available to a non-scientific public, scientific knowledge produced locally is becoming more readily available through repositories of various Latin American countries, Caribbean, Spain and Portugal.

Another case is the Journals Portal (Portal de Periódicos) of CAPES created by the Ministry of Education. It is an online library with the aim of making national scientific production available to post-graduate programmes in teaching and research institutes in Brazil. It presents "... a repository with more than 30,000 titles with full text, 130 databases of references, 10 databases dedicated to patents only, not to mention books, encyclopaedias and reference works, technical norms, statistics and audio-visual materials." (<http://www.periodicos.capes.gov.br/>).<sup>10</sup> In addition, in Brazil there are online academic libraries, the repository of theses and dissertations of CAPES (<http://capes.gov.br/servicos/banco-de-teses>) and the Online Brazilian Library of theses and dissertations of the Ministry of Science and Technology (<http://bdt.d.ibict.br/>). They aim to facilitate free access to theses and dissertations of Brazilian postgraduate programmes.

Despite these tools offering access to scientific knowledge, it cannot be guaranteed that the knowledge made available is actually accessed and effectively taken into account in the decision making process. Our research has observed that policy makers do not necessarily use these tools to obtain information.<sup>11</sup> Therefore, communication struggles with the fact that policy makers do have access to multiple sources of information which, at least, need to be critically analysed before being used as a basis for decision making. In other words, free online access makes communication easier, but also makes the use of

information difficult for the social actors involved. Because they are not ‘scientifically literate’,<sup>12</sup> policy makers often feel ‘lost’ when having to choose more reliable information ‘... to ensure that wise science policies are developed and implemented.’ (id, p. 175). This seems to indicate that there need to be strategies mediating between science communication and politics, which is referred to by Weigold as the ‘popularisation of science’.

Some centres located in countries where evidence has long been used by policy makers, have cleverly made the use of knowledge feasible in a more judicious way. They systematically revise bibliographies (meta-analysis) which stem from demand or from specific issues, mainly in fields like health, education or biodiversity. In this regard, we would like to mention two cases currently being developed by our research group. On the basis of the results of our research, both cases aim to make bibliography information available on two environmental issues for those who are interested, in particular for the decision makers.

Within the context of CINAIS, there has been a bibliographic revision of the Brazilian production dealing with the conservation of biodiversity related to family farms.<sup>13</sup> As a result, a list of publications<sup>14</sup> is now available on its website ([www.ufrj.br/cpda/cinais](http://www.ufrj.br/cpda/cinais)), and the surveyed publications have also been analysed.<sup>15</sup> The methodology adopted did make use of the aforementioned platforms and bibliographic database above mentioned, using key words such as biodiversity, sustainability and agriculture.

Within the research group of NEUS, between 2009 and 2012 the Brazilian scientific production was mapped for topics like climate change<sup>16</sup> in the different areas of knowledge,<sup>17</sup> and is to be made available on an institutional website. In addition to the online database mentioned above, within this project the methodology has access to two databases made available by the Ministry of Science, Technology, and Innovation through its agency of the National Council for scientific and Technological development (Conselho Nacional de Desenvolvimento Científico e Tecnológico/CNPq): the database of research groups (<http://dgp.cnpq.br/diretorioc/>) to locate groups interested in climate change; and the CVs Brazilian Researchers database (<http://lattes.cnpq.br/>) to access the production of the leader of the selected group.<sup>18,19,20</sup>

In our studies, we noticed that a consultation strategy was frequently mentioned by the interviewees with the aim to streamline the access to scientific knowledge: the workshops. They are organised with the main purpose of obtaining information directly from the invited scientists. Interesting to mention that, within the existing dynamics of this type of access, what matters is the relationships among decision makers, NGOs (those having access to governmental instances or acting on environmental area), experts networks and well-known scientists (those who are acknowledged for having authority in the knowledge field).

This consultation presents a positive aspect when organised in the form of workshops. The closeness between policy makers and scientists during these events may mitigate the problem of the language, an obstacle which very often is hardly overcome.<sup>21,22</sup> After all, the scientific discourse in reliable scientific publications, based on bibliographic databases and platforms already mentioned in this article, is produced to be read and assessed by peers and not to be popularised.<sup>23,24</sup> This, however, hampers the effectiveness of scientific communication conveyed to the general public, including the decision makers.

Different from the workshops, which are requested by compilers, in the case of the amendment of the Brazilian Forest Act<sup>25</sup> the Brazilian scientific community,<sup>26</sup> which is situated at the margins of such debate, produced and distributed an online document whereby it expressed its opinion about this change.

Three remarkable cases are worth mentioning with regards to climate change. Upon request of the State Espírito Santo, the Forum Capixaba on Climate Change (Fórum Capixaba de Mudanças Climáticas, <http://www.fcmc.es.gov.br/>) started working to design a proposal which would later become the State Policy on Climate Change (Law No. 9.531, 15 September 2010<sup>27</sup>). As outlined in the Brazilian MC Forum, the local forum (the Capixaba Fórum on Climate Change) is also a democratic one, allowing actors from different fields to participate, including government officials and members of the organised civil society, (as for example scientists from the Federal University of Espírito Santo/UFES, mostly from the field of Exact Sciences) and multinational companies located near to Vitoria Metropolitan Region (as Arcelor Mittal and Vale). These meetings usually saw the presence of a scientist who was nationally renowned for being an expert in climate change, and was affiliated to education and research bodies (COPPE/UFRJ and EMBRAPA). The main purpose was that of having direct access to technical and scientific information, able to support political topics. The Policy on Climate Change of the State of São Paulo (Law no. 13.798<sup>28</sup>) set up in 2009 was taken as the main point of reference for this process.

Another interesting case was that of ‘Climate Change, Poverty and Inequalities’ Working Group of the Brazilian Forum on Climate. On the basis of the criticism made against the National Policy on Climate Change, whereby there is no attention to the adaptation to climate events, this Work Group created a

document entitled ‘Subsidies for the Setting up of the National Plan for the adaptation to human impact on climate change’. In other words, this document did not address a political request, but the aspiration of various social actors on the basis of the debate about the need to create a policy for the adaptation of vulnerable communities to climate change.

The process saw a great participation of the actors involved, relying on the expertise of professionals in connection with NGOs and governments, public and private education and research institutions, not only from the environmental area. These participants were divided into 10 theme subgroups<sup>29</sup> in order to present a proposal which was organised by the coordinating committee of the Work Group. The final result of this first stage was presented, discussed and assessed during a seminar on adaptation and vulnerability by various professionals belonging to different fields. After a final revision included into these contributions a final proposal was drafted and submitted to the Presidency of the Republic in 2011.

Finally, another case to be reported is that of the recent public consultation on the Plans of Mitigation and Adaptation to Climate Change (Planos de Mitigação e Adaptação à Mudança do Clima) for the industrial, mining, health and transport sectors, made online at <http://www.mma.gov.br/consultasclima> between June and August 2012. These plans are included in the Brazilian strategy for mitigation and adaptation to climate change. Under the coordination of the Ministry of Environment (Executive Group on Climate Change), officials of six ministries<sup>30</sup> together with actors from companies and organised civil society contributed to the design of these plans, appointed by the Brazilian Forum on Climate Change and by the coordination teams of the plans. In other words, the drafting of the plan is an open democratic process which aims to involve society in general in the process of the design of a public policy.

## Conclusion

Despite the fact that there are obstacles affecting the communication between science and policy, in Brazil there are the positive environment to bridge the gap between the two. We have presented some Brazilian strategies which were implemented to facilitate the communication between science and policy makers. It is recognised that in Brazil there is no institutionalised use of consultation in particular with the scientific community to support the design of public environmental policies. In some cases, players of civil society involved in environmental governance – the scientists – are still marginalised from this process.

However, more and more organisational structures which mediate between science communication and policy-making have been created recently and they play the role which belongs to science communicators. On the basis of what has been presented so far, there are different strategies ranging from online platforms or repositories with scientific publications to events arranged by scientific and non-scientific organisations, aiming at playing the role of intermediaries to disseminate information able to support the design of public policies. Two aspects are worth highlighting. Firstly, the public consultation has been a participation process involving the scientific community in public measures about climate change. Secondly, workshops are strategies facilitating a face-to-face dialogue between policy makers and scientists.

Despite this favourable context, it is clear that in Brazil scientific research results still need to be better disseminated at least concerning these two issues to raise awareness among the population. The scientific community points at this need when it is socially exposed any time they publish a document with their views on topics which belong to the political debate. An example of this may be found in the redesign of the Brazilian Forest Code. Although in Brazil scientific journalism is confined to some media only, it is still to be exploited more, both when it targets at non-expert public in general and at specific policy-making process.

*Translated by Sabrina Brusemini*

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- <sup>29</sup> Topics including health, risks mitigation, urban, agricultural and social development, environmental education, food safety.
- <sup>30</sup> Ministries of Cities, Transport, Health, Mining and Energy, Development, Industry and Foreign Commerce.

## Authors

Teresa da Silva Rosa - Professor, Postgraduate Program of Political Sociology - Master Degree, University Vila Velha/UVV – ES (Brazil), Center for Urban and Socio-Environmental Studies (NEUS/UVV). E-mail: [tsrosaprof@yahoo.com.br](mailto:tsrosaprof@yahoo.com.br).

Maria José Teixeira Carneiro - Professor, Postgraduate Program of Social Sciences in Development, Agriculture and Society / CPDA, Federal Rural University of Rio de Janeiro / UFRRJ, coordinator at the CINAIS (Science, Nature, Information and Knowledge) research group, UFFRJ. E-mail: [mjtcarneiro@gmail.com](mailto:mjtcarneiro@gmail.com)

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