From restoration to responsive governance

Rio Doce after the Fundão Dam failure

C. Maroun, J. Renshaw, L.E. Sánchez, F.A.R. Barbosa, M.C.W. Brito, P. May, Y. Kakabadse

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The economic, environmental and social context of the Rio Doce watershed is dynamic and rapidly changing. The Rio Doce Panel has prepared this report with the best publicly available information at the time of its writing, and acknowledges that new studies and information are emerging that will shed further light on the restoration effort.

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Cover photo: The situation of fishers in the region whose activities have almost stopped since the collapse of the Fundão Dam (by Gustavo Baxter/NITRO).

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Contents

List of boxes, figures and table

List of acronyms

APP	Área de Preservação Permanente (Permanent Preservation Area)
BIOFIN	Biodiversity Finance Initiative
CBH-Doce	Comitê da Bacia Hidrográfica do Rio Doce (Rio Doce Watershed Committee)
CBP	Chesapeake Bay Programme
CDHU	Companhia de Desenvolvimento Habitacional e Urbano (Urban and Housing Development Company)
CFA	Conservation Finance Alliance (CFA)
CIF	Comitê Interfederativo (Inter-Federative Committee)
CNRH	Conselho Nacional de Recursos Hídricos (National Council for Water Resources)
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute for the Environment and Renewable Natural Resources)
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
NGO	Non-governmental organisation
PAP	Plano Plurianual (Multi-Annual Plan)
PCJ	Piracicaba-Capivari-Jundiaí River Watershed
PES	Payment for environmental services
PIRH	Plano Integrado de Recursos Hídricos (Integrated Water Resources Plan)
PMSB	Plano Municipal de Saneamento Básico (Municipal Basic Sanitation Plan)
PNGC	Plano Nacional de Gerenciamento Costeiro (National Coastal Management Plan)
PNRH	Política Nacional de Recursos Hídricos (National Water Resources Policy)
S2S	Source-to-sea
SHM	Sydney Harbour Manager
SINGREH	Sistema Nacional de Gerenciamento de Recursos Hídricos (National Water Resources Management System)
TTAC	Termo de Transação e Ajustamento de Conduta (Terms of Transaction and Conduct Adjustment)
TAC-GOV	Termo de Ajustamento de Conduta – Governança (Terms of Conduct Adjustment – Governance)
WFD	Water Framework Directive

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- Representatives of Rio Doce Watershed Committee;
- Representatives of the Technical Committee and Advisory Board of Renova Foundation;
- Representatives of Affected People Commissions in Minas Gerais and Espírito Santo;
- Representatives of the States of Minas Gerais and Espírito Santo;
- Representatives of socio-environmental non-governmental organisations working in the watershed; and
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Foreword

Good governance lies at the heart of a healthy modern society, and among its basic tenets are transparency, efficiency, effectiveness, and responsiveness. A well-functioning governance system ensures that the interests of the public are heard and protected; it creates stable processes and frameworks to follow; and it ultimately builds trust in the state. This is especially crucial in the face of disasters, allowing broken communities to rebuild, and helping to protect them from future similar catastrophes.

It is in this context that the Rio Doce Panel draws much-needed attention to the governance of Brazil's Rio Doce watershed. Through this report, the independent Panel analyses the institutional weaknesses exposed by the 2015 Fundão Dam collapse – and which continue to impede efforts to both restore 670 km of heavily polluted landscapes across two states, as well as compensation of the communities living along this stretch.

As part of the settlement between the authorities and the responsible companies, a complex governance system was established to lead the recovery work. This governance structure aimed to implement and supervise social, economic and environmental programmes in the watershed to restore livelihoods and mitigate the impacts of the dam collapse. Additionally, it endeavoured to enhance awareness and data generation in the area. Despite some progress, the region's citizens have yet to be effectively engaged, and rights-based approaches that could mitigate the conflict and mistrust that continues today have yet to be implemented.

This report highlights the need for building a long-term vision for the Rio Doce source-to-sea system that is shared by all stakeholders, especially local affected communities. The Panel outlines several recommendations on how restoration could be accompanied by a more responsive governance model, greater transparency, effective communication and well-targeted financial resources. Engaging citizens and institutions in planning policies and actions will benefit both people and biodiversity. A fair, participative, and trusted system of governance lies within reach – but only through strengthening the current institutions and retaining the knowledge gained in the past five years.

IUCN strongly encourages decision-makers to consider these governance recommendations, so that the future of the vital Rio Doce watershed can be secured.

Dr Bruno Oberle
Director General
IUCN, International Union for Conservation of Nature

Preface

The disaster that occurred in 2015 when the Fundão dam collapsed demanded an immediate response and a coordinated effort involving many stakeholders due to its magnitude and the complexity of the region. The affected territory covers a vast area, in two Brazilian states, with distinct social, economic and cultural characteristics, which had already been degraded by decades of extractive activities and unsustainable agricultural practices. Given the need to achieve tangible short-term results, the public authorities and the companies responsible for the disaster agreed on a transitional system comprising 42 reparation and compensation programmes. The initial agreement created the Renova Foundation and the Inter-Federative Committee to implement and supervise the restoration agenda. However, this governance system was ineffective for ensuring the active involvement of the affected people in the decision-making process. In 2018, a further agreement was signed, which was intended to promote greater dialogue and participation with the affected communities, but so far it has yet to be fully implemented.

This new Thematic Report is focused on the long-term governance system needed to ensure the continuity and effectiveness of the restoration programmes. It highlights the importance of establishing a shared vision for the future of the Rio Doce watershed. This should be developed through a participatory process, and should define and plan the necessary actions and identify the investments required to ensure the continuity of the activities. This process will require effective and transparent communications so that all stakeholders, including the specialists and the public, can better understand the critical and complex environmental, social and economic issues that affect the Rio Doce from source-to-sea.

The report also considers the legacy of the restoration efforts. It draws attention to the scale of the investments made to-date, which offers an opportunity to institute a model of good governance based on an effective participatory approach. It stresses the importance of establishing a repository or repositories for the information that has been generated and a communication programme to ensure the information will be accessible to all stakeholders and intelligible to the general public.

Finally, the report outlines measures to ensure the continuity of activities once the restoration programmes have been completed, and argues that continuity will depend on support to strengthen the permanent institutions that will eventually take over responsibility for the recovery of the Rio Doce watershed and the associated coastal and marine areas.

Rio Doce Panel

1 Executive summary

The Rio Doce watershed and its adjacent coastal and marine areas have been affected by centuries of extractive activities and unsustainable agricultural practices (May et al., 2019). When the Fundão tailings dam collapsed on 5 November 2015, a wave of mud swept down the river to the sea, causing 19 deaths, destroying villages, riparian vegetation, scraping off river sediments and disrupting the lives of thousands of people (Sánchez et al., 2018). The response to a disaster of this magnitude is an extraordinary challenge for which the public authorities and existing structures of governance were not prepared (Lavalle et al., 2019). It requires major long-term commitments and coordination on the part of state governments, local authorities, the Rio Doce Watershed Committee (*Comitê da Bacia Hidrográfica do Rio Doce*, or CBH-Doce), the judiciary, public prosecutors, private sector, universities and research institutions and, most of all, community organisations, along with Samarco and its shareholder companies.

In March 2016, a temporary governance structure for the restoration was set up under an out-of-court agreement between Samarco and its parent companies (Vale and BHP), and the federal and state government agencies responsible for environment, health, social welfare and economic development. This out-of-court agreement, called the Terms of Transaction and Conduct Adjustment (*Termo de Transação e Ajustamento de Conduta*, or TTAC) includes 42 programmes designed to compensate for the impacts of the disaster and restore the environmental and socio-economic conditions.[1] Since TTAC will remain in effect as long as necessary for the full recovery of the affected areas and communities, a timeframe or detailed procedures for the completion of these programmes was not defined.

The central institutions of the TTAC are the Inter-Federative Committee (*Comitê Interfederativo,*[2] or CIF) and the Renova Foundation, a private entity fully funded by Samarco and its parent companies, which was established to implement the 42 programmes. In the five years since the disaster, these institutions have been working on the restoration of the affected area, through the environmental programmes set out in the TTAC. The Renova Foundation has also paid indemnities to many of the affected people.

The current structure of governance has also generated a wealth of information, making the Rio Doce one of the most monitored rivers in Brazil. Moreover, the CIF-Renova arrangement has facilitated coordination between federal and state government agencies and technicians that historically had little interaction, including agencies responsible for health, environment and economic development. In spite of this, the CIF-Renova arrangement has not been able to effectively engage communities in a way that allows the development of the long-term, participatory relationships with the affected people and other key stakeholders. The ability to resolve problems in an efficient, equitable and democratic manner should merit as much importance as the delivery of outputs and outcomes. (Young, 2013).

In order to resolve this issue, another agreement was signed in June 2018, the TAC-GOV, which considers the implementation of a series of structures to facilitate stakeholder participation. TAC-GOV implementation is very incipient and the governance arrangement is still facing difficulties in achieving the restoration goals and objectives related to health and social-economic areas, not only because of the complexity of the task, but also because of the adversarial nature of the relations between the stakeholders and the difficulty of

1 For further information, please see: https://www.fundacaorenova.org/wp-content/uploads/2016/07/ttac-final-assinado-para-encaminhamento-e-uso-geral.pdf

2 Idem.

ensuring the effective participation of the people most directly affected by the disaster.

Furthermore, the process of restoration has to take into consideration the long-term governance of the Rio Doce watershed, since the programmes of the permanent institutions and the restoration are overlapping and complementary. The studies, data, information systems and especially the capacity developed under the restoration programmes, are at risk of being lost if they are not integrated into the permanent structures of governance that can guarantee their continuity. The long-term system of governance should take a source-to-sea (S2S) approach that encompasses not only the spatial dimension (terrestrial and/or coastal areas), but also key flows – water, biota, sediment, pollutants, materials and ecosystem services (Granit et al., 2017).

The 'baseline' from which the restoration of Rio Doce is being developed should be grounded on a scientific analysis of the situation in the region and developed through engagement with the affected communities and other key stakeholders.

In terms of communication, which goes beyond disseminating information, it should be a process to ensure that the affected people and other relevant parties are made fully aware of the various aspects of the critical issues they face, avoiding the trap of bringing mostly good news or offering a one-sided vision of the reality in the region.

A review of governance studies (Young, 2013; Nielsen, 2016; Campese et al., 2016; Flotemersch et al., 2016; FBDS, 2017; GIZ, 2019; Lavalle et al., 2020; Puga et al., 2020) identified three structural axes for establishing an efficient and responsive approach: (i) social participation and capacity for collaboration among different stakeholders; (ii) transparency and effective communication; and (iii) sufficient financial resources for the implementation of plans and programmes.

In line with the three structural axes described above, and taking in consideration the Panel's knowledge of the current situation in the Rio Doce watershed as well as the governance frameworks described in existing literature, the Panel concludes that:

i) a number of the TTAC programmes overlap with the programmes of permanent institutions that work in the region;
ii) CBH-Doce is a key institution that could play a greater role in restoring the source-to-sea system over time;
iii) there is a need to improve the disclosure of information and communications related to the actions and outcomes of restoration in order to guarantee social participation and monitoring of the restoration efforts to ensure long-term community empowerment;
iv) the TTAC was developed in response to the immediate crisis caused by the disaster, with insufficient time given to discussion or participation of the people most directly affected; and
v) a strategy for a transition to a post-Renova era has not yet been discussed with the stakeholders throughout the source-to-sea system.

Based on these conclusions, the Panel proposes four recommendations:

Recommendation 1 – Build a common vision for the Rio Doce source-to-sea system

There is a need to agree on **a common vision for the sustainable future of the Rio Doce source-to-sea system**. This should be built through a participatory process involving local communities and other stakeholders in the restoration process. An important step would be for the institutions involved in the restoration to work together to leverage greater stakeholder participation as envisaged in the TAC-GOV. Once that is achieved, it could offer an opportunity for Renova Foundation and CIF to engage more effectively with community organisations, NGOs, local governments, universities and other relevant stakeholders to discuss and agree on a long-term vision for the restoration of the region affected by the disaster and the wider source-to-sea system.

Recommendation 2 – Prepare for the transition to the post-Renova era

As the Renova Foundation is not responsible for the long-term development of the region, the foundation, State Governments and the CIF should agree on the **process and arrangements needed to achieve the eventual transition to a post-Renova era**. This should be part of the renegotiation of the TTAC and include the following steps: (i) definition of the priority programmes to ensure their continuity; (ii) engage with stakeholders to ensure continuity during the transition and post-Renova era; (iii) undertake a study of the long-term alternatives to ensure adequate financial resources are available once Renova has completed the restoration programmes and activities envisaged in the TTAC and its renegotiations; and (iv) carry out a process to engage communities in the monitoring of the outcomes of the restoration.

Recommendation 3 – Create a repository of data, information and documents

The Renova Foundation, with support from the CIF, should identify and develop one or more mechanisms to maintain and update the data, information and documents generated by TTAC's programmes and all the related studies. **This repository should include simplified documents, videos and podcasts, to inform the general public about the data and studies developed in Renova's programmes and other studies related to the restoration**.

Recommendation 4 – Further engage the Rio Doce Watershed Committee in the restoration efforts

Renova Foundation and CIF are encouraged **to support the Rio Doce Watershed Committee (CBH-Doce) to play a stronger role in the restoration process**. Since CBH-Doce is the multi-stakeholder organisation charged with promoting and improving water governance in the Rio Doce watershed, its effective participation in the restoration process will help ensure the sustainability of the long-term programmes.

As a starting point, the following short-term measures can be implemented:

i) Engage with CBH-Doce to align the Integrated Water Resources Plan for the Rio Doce watershed with the restoration efforts. The plan is currently under review and expected to be completed in 2021.
ii) Support the resumption of the CBH-Doce water quality bulletins to provide clear and accessible information that can be easily understood by the population at large.
iii) Support the integration of coastal area management into the activities of CBH-Doce to incorporate the source-to-sea system in plans for the region's development.

1 Introduction

Throughout history, people have settled near rivers, leading to significant impacts on the surrounding watersheds, lakes and coastal areas, and affecting ecosystems and the essential services. As those impacts accumulate over time, the restoration of hydrographic regions and the build-up of governance structures emerged as important challenges in different regions of the world. With extreme weather events intensifying due to climate change and consequently affecting how water resources and other ecosystem services are managed (Puga et al., 2020), the need for these efforts is greater than ever.

The Rio Doce watershed and its adjacent coastal and marine areas have been affected by centuries of extractive activities and unsustainable agricultural practices (May et al., 2019), beginning with gold mining in the 17th and 18th centuries and more recently large-scale iron ore mining in the upper watershed. Currently, low-productivity cattle raising and dairy farming can be found alongside industrial forestry (for the pulp and paper and the steel-making industries) and agro-industries (including most recently the production of sugar and ethanol). Degraded lands, impoverished and eroded soils and poor water quality are key features of the area.

When the Fundão tailings dam collapsed on 5 November 2015, a wave of mud swept down the river to the sea, causing 19 deaths, destroying villages, riparian vegetation and scraping off river sediments, disrupting the lives of thousands of people (Sánchez et al., 2018). The response to a disaster of this magnitude, with widespread environmental, social and economic consequences, is an extraordinarily challenging undertaking for which the public authorities and existing structures of governance were not prepared (Lavalle et al., 2019). They faced the complex task of restoring the ecosystems and livelihoods that had been affected by the collapse of the Fundão Dam in an already degraded region that has little experience of participatory governance, and with the need to deliver tangible results as quickly as possible. In such a situation, sound governance is essential for providing sustainable and resilient outcomes to mitigate the impacts of the dam failure and even more importantly, to guarantee the long-term effectiveness of the restoration programmes.

As a result of the efforts of several government agencies and other relevant stakeholders, a complex arrangement to coordinate the restoration of Rio Doce was put in place,[3] with the signature of TTAC and creation of the Inter-Federative Committee (Comitê Interfederativo, or CIF) and Renova Foundation. Later, in mid-2018, the TAC-GOV was signed to promote the participation of the people affected by the disaster in the governance system.[4] Five years after the disaster, these institutions have been able to achieve some restoration of the affected areas, through the environmental programmes set out in the TTAC. Many of the people affected by the disaster have also received indemnity payments.

The current structure of governance has also generated a wealth of information, making the Rio Doce one of the most monitored rivers in Brazil. Moreover, the CIF-Renova arrangement has facilitated

3 The term 'restoration', used systematically since the first Rio Doce Panel Thematic Report, refers to the restoration of the biophysical conditions and lifestyles of those affected. Widely used internationally, it was preferable than the use of 'repair' as defined by the Terms of Transaction and Conduct Adjustment (*Termo de Transação e Ajustamento de Conduta*, or TTAC).

4 TTAC is an out-of-court settlement reached between Samarco and its parent companies – Vale and BHP – and the Federal and State governments on 2 March 2016. It defines the establishment of the Inter-Federative Committee and Renova Foundation. Terms of Conduct Adjustment–Governance, or TAC-GOV, was agreed and signed on 25 June 2018 (see section 3).

Aerial image from October 2017 of the area affected by the collapse of the Fundão Dam in Mariana, Minas Gerais.
Photo: Vinícius Mendonça/Ibama

coordination between federal and state government agencies and technicians that historically had little interaction, including agencies responsible for health, environment and economic development. In spite of this, the CIF-Renova arrangement has not been able to effectively engage communities in a way that allows the development of the long-term, participatory relationships with the affected people and other key stakeholders. The ability to resolve problems in an efficient, equitable and democratic manner should merit as much importance as the delivery of outputs and outcomes. (Young, 2013).

The system is still facing difficulties in achieving its goals and objectives, not only because of the complexity of the specific tasks, but also because of the adversarial nature of relations between stakeholders involved and the difficulty of ensuring effective participation of the people most directly affected by the disaster.

Given the high complexity of decision-making in the several structures of authority that are part of the CIF-Renova system, the restoration process is not able to guarantee the investments needed for the long-term management of the region. Taking into account the importance of maximising the benefits of large investments committed for restoration of the areas affected by the disaster, the current decision-making arrangement could lead to missed windows of opportunity. Thus, there is a need to set in motion processes that will ensure the continual improvement of social, economic and environmental conditions in the watershed and in the coastal and marine areas affected by the disaster.

While this report recognises that the restoration programme cannot be held responsible for the resolution of all the pre-existing systemic issues, it can offer models and methodologies, and encourage more effective governance and inter-institutional collaboration. In turn, this will lead to more effective, efficient, resilient, and sustainable management of the region over the long-term.

To achieve the intended outcomes of the ongoing restoration efforts and ensure that those outcomes are sustainable and resilient (Sánchez et al., 2018), the Panel considers it essential that the governance of the restoration process be conversant with the existing long-term governance of the watershed and the coastal zone.[5] In terms of expenditures, recent information indicates that BRL 12.81 billion has been spent as of March 2021 in restoration and compensation.[6] It is therefore timely to take advantage of the investments in the restoration efforts, as a push factor to strengthen governance of the Rio Doce watershed and its adjacent coastal and marine areas.

The challenge is of paramount importance, which goes well beyond repairing the damages caused by the rupture of the dam. It requires major commitments and coordination on the part of state governments, especially the local authorities, CBH-Doce, the judiciary, public prosecutors, private sector, universities and research institutions, and most of all, the community organisations, which need to define what communities want for their region to build a common vision for the future.

The report is organised into six sections. Section 2 introduces definitions of governance, both practical and theoretical, and discusses the concepts and possible approaches for consideration, as well as the characteristics of good governance illustrated by success stories. An overview of existing governance structures and major stakeholders in the Rio Doce, including permanent authorities and organisations (long-term institutions), is presented in section 3. Additionally, the context of the report is provided

5 For the purpose of this report, governance of restoration (or restoration governance) refers to the temporary Renova-CIF system, as well as other temporary institutions involved in the restoration efforts; governance of the watershed (or long-term governance) refers to the existing governance related to the perennial institutions, such as federal, state and municipal governments, watershed committees, the Judiciary, public prosecutors and others.

6 For further information, please see: https://www.fundacaorenova.org/en/the-foundation/

Plant nursery workers extracting seeds to plant seedlings to replant the native vegetation through a partnership with Instituto Terra, who signed an agreement to replant trees and recover springs along the Rio Doce.
Photo: Gustavo Baxter/NITRO

by describing the governance structure created for the restoration process. Section 4 presents an assessment of the five most important issues related to long-term governance that can be enhanced by the restoration efforts in the Rio Doce. In this section, actions to achieve responsive long-term governance for the impacted region are also proposed. It includes a discussion of concerns related to transitional arrangements. Finally, section 5 poses conclusions and recommendations, including initiatives that could be undertaken by the stakeholders in the restoration and long-term governance of the affected region.

2 Setting the framework – Concepts and approaches

2.1 What is governance?

The term 'governance' has been used in many ways by different authors in a wide variety of contexts (Bevir, 2012). Over time, governance has been analysed and implemented at different scales using diverse approaches that have evolved since the concept was first used.

Elinor Ostrom, who was awarded the Nobel Prize in 2009 for her analysis of economic governance, views governance as an evolutionary polycentric process, in which complex and myriad historical, cultural, social, economic and political factors may be at play. From this perspective, the balance of power between the different actors is achieved through polycentrism, representing the interaction between different centres of authority, which self-regulate themselves by engaging citizens authorised to act or prevented from operating the resources of common property. The polycentric structure operates based on the diversity of actors, levels, sectors and functions (Ostrom, 1990).[7]

In the context of this paper, the definition for natural resources governance presented in the Natural Resources Governance Framework Assessment Guide (Campese et al., 2016) can be aligned with the polycentrism described by Ostrom. The guide considers that governing natural resources for justice and equality will lead to the enhancement of quality of life as a whole, stating that:

> "governance can be understood as the norms, institutions, and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens – including women, men, youth, indigenous peoples and local communities – secure access to, participate in, and are impacted by the management of natural resources" (Campese et al., 2016, p. 1).

Moving from theory to praxis with water as a focal point, given that water quality and availability are major issues for human well-being, water governance approaches and scales are widely applied globally (Kirschke et al., 2017). Managing water resources is intrinsically related to territorial and natural resources management, and is a long-term and unceasing process (Flotemersch et al., 2016). This process requires the input and interaction of governments, agencies and organisations at international, national, regional and local levels, including the private sector, charitable enterprises and dedicated individuals. In recognition, countries agreed to adopt integrated approaches to water resources management (IWRM) at the 1992 Earth Summit in Rio de Janeiro (UNEP, 2018), which has been implemented in an array of hydrographic regions throughout the world.

In recent years, to strike the connection between the social system and the ecological system, the water governance concept linked to IWRM evolved into a more comprehensive approach seeking to integrate different natural resources in a systemic perspective that is now termed as 'ecosystem governance'. As defined by IUCN, ecosystem governance is an inclusive approach that better connects the social system with the ecological system to improve conservation of biodiversity and ecosystem health for human well-being (Vasseur et al., 2017). The difference between natural resources governance (water governance included) and ecosystem governance is the integrated perspective associated with the latter.

7 The commons are the cultural and natural resources accessible to all members of a society, including assets such as air, water and a habitable earth.

Considering that watersheds are the landscape units already defined by IWRM, governments have been progressively implementing policies that take into account the scale of the watershed for the long-term water sustainable management. Although considering the watershed as the management unit for water governance is recognised as a significant improvement, policies are often limited to protecting water quality or conserving water for human consumption, disregarding the connectivity and ecological flows needed to maintain biodiversity and social systems.

2.2 The institutional framework of water governance in Brazil

In Brazil, the governance of water is regulated by the National Policy of Water Resources (*Política Nacional de Recursos Hídricos*, or PNRH) established in 1997. The policy instituted the watershed as the management scale, and promoted a process of decentralisation based on the principles of integrated management of water resources aiming at a multi-sector, multi-scale and participatory system of management (Puga et al., 2020). The PNRH created conditions to identify conflicts over the use of water through water resources plans for river watersheds, and to arbitrate conflicts in the administrative sphere.[8] The instruments established by PNRH for water resources management (Government of Brazil, 1997), which feed the associated water governance, are:

i) Integrated water resources plans;
ii) Framework for water quality and usage types for water bodies;
iii) Granting of rights to the use of water resources;
iv) Charges for water use; and
v) A system of information on water resources.

Moreover, the watershed governance established by PNRH provides the legal framework for an equitable participation in the decision-making process shared by government, water users and civil society. In the Rio Doce, CBH-Doce is the focal point of a network governance system (see Figure 1), which includes 11 watershed committees of the affluent and tributary rivers that are part of the watershed. Decisions are taken by the representatives of the above-mentioned three sectors.[9]

Management of the coastal zone is present in Brazilian legislation since 1988 through Law No. 7.661 of May 16, 1988,[10] which established the National Coastal Management Plan (*Plano Nacional de Gerenciamento Costeiro*, or PNGC). The coastal zone encompasses lagoons and estuaries, the territorial limits of the coastal municipalities, and may include inland limits up to 50 km from the coast. The Rio Doce estuary is part of such zone, jointly managed by the federal, state and local governments.

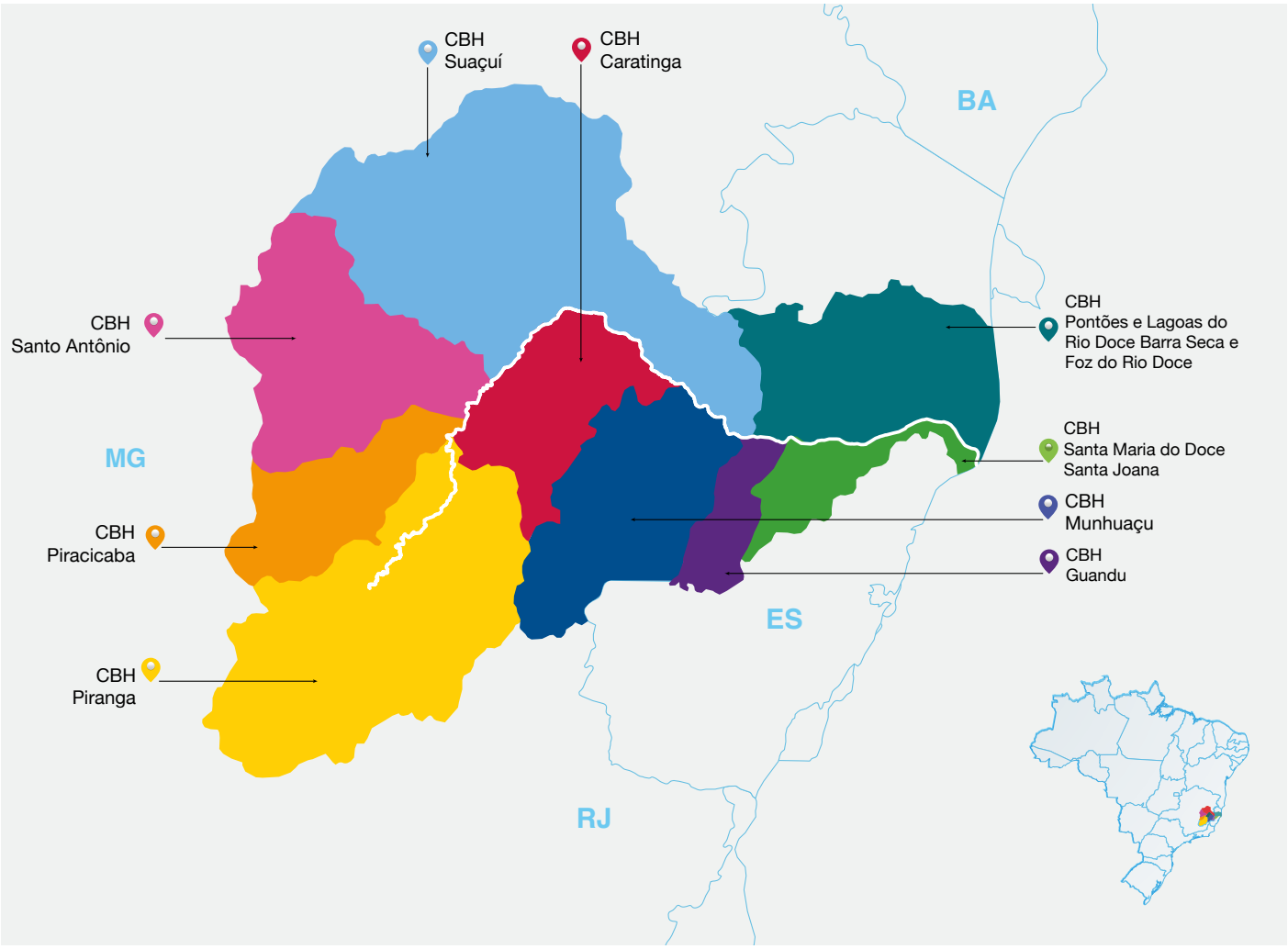
2.3 Territorial governance through the source-to-sea system

The strengths and shortcomings of coastal management in Brazil have been reviewed by Klumb-Oliveira and Souto (2015). Their study finds that there is a lack of environmental data and insufficient consideration of the maritime domain. It is relevant to note that both planning and governance systems – watershed and coastal zone – overlap in the coastal region, although there is limited, if any, interaction between the agencies responsible for their governance.

Both water governance and ecosystem governance are often structured around individual segments, such as the watershed, making them less suited as tools for integrating a system that encompasses freshwater resources and coastal and marine areas (Mathews et al., 2019). The segmentation of policies, procedures and regulations are often directed toward maximising local benefits and are blind to the broader landscape perspective.

8 For more information, please visit the Brazilian National Water Agency website: https://www.ana.gov.br/eng/
9 The Rio Doce watershed covers an area of 86,715 km^2, of which 86% is located in the State of Minas Gerais and 14% in the State of Espírito Santo. There are 225 municipalities in the watershed – 200 in Minas Gerais and 25 in Espírito Santo (Consórcio Ecoplan/Lume, 2010).
10 For more information, please see: http://www.planalto.gov.br/ccivil_03/leis/l7661.htm

Figure 1
CBH-Doce and the 11 watershed committees that are part of the CBH-Doce network



Source: Prepared by Rio Doce Panel based on information from MMA/ANA/2011.

The governance scale that could overcome such limitations is the proposed source-to-sea system (S2S) (Granit et al., 2017), whose framework was already defined and explored in Rio Doce Panel's Thematic Report No. 3 (Brito et al., 2021). The S2S system encompasses not only the spatial dimension (terrestrial and/or coastal areas), but also key flows, such as water, biota, sediment, pollutants and materials, and ecosystem services (see Figure 2).

As applied to the area affected by the Fundão Dam failure, the S2S system covers the totality of the Rio Doce and the terrestrial and oceanic areas influenced by the flow of sediments – and, as a consequence, the area potentially affected by the tailings, which is the scale of the governance covered by the recommendations of this report.

Improvements in governance must focus on interactions between practitioners with context-specific knowledge and analysts (Young, 2013), who can provide a broader picture, with a focus on bottom-up participatory structures that can empower the participation of local communities in the S2S system of governance over the long-term.

While this report takes a S2S perspective and examines the existing participatory governance structure of the Rio Doce watershed (CBH-Doce and its network of catchment and tributary rivers committees), it will also assess the opportunities for building on the region's existing long-term structures of governance. Likewise, temporal (long-term) and spatial scalability will be taken into consideration, with flexibility and adaptability (Campese et al., 2016).

2.4 Key characteristics of good governance: some case studies

Various efforts have been made to discuss, evaluate, learn and disseminate examples of good governance. A recent study on successful restorations of hydrographic regions (FBDS, 2017) aimed to find examples of successful approaches that could be also applied to the challenges for governance in the Rio Doce context. The study confirmed that different governance models could be equally effective, using diverse strategies that vary from centralised to polycentric models, or specific natural resources (such as water) to ecosystem focus and geographic scope (such as watershed and S2S). The common thread to all successful models, also acknowledged by Nielsen (2016), was the presence of key elements, including communication, trust, commitment, understanding and clear expected outcomes.

Connecting FBDS (2017) and Nielsen (2016) with other studies of ecosystem or natural resources governance (Young, 2003; Campese et al.; Flotemerch et al., 2016; GIZ, 2019; Lavalle et al., 2020; Puga et al., 2020), three structural axes for establishing a virtuous cycle of governance stand out:

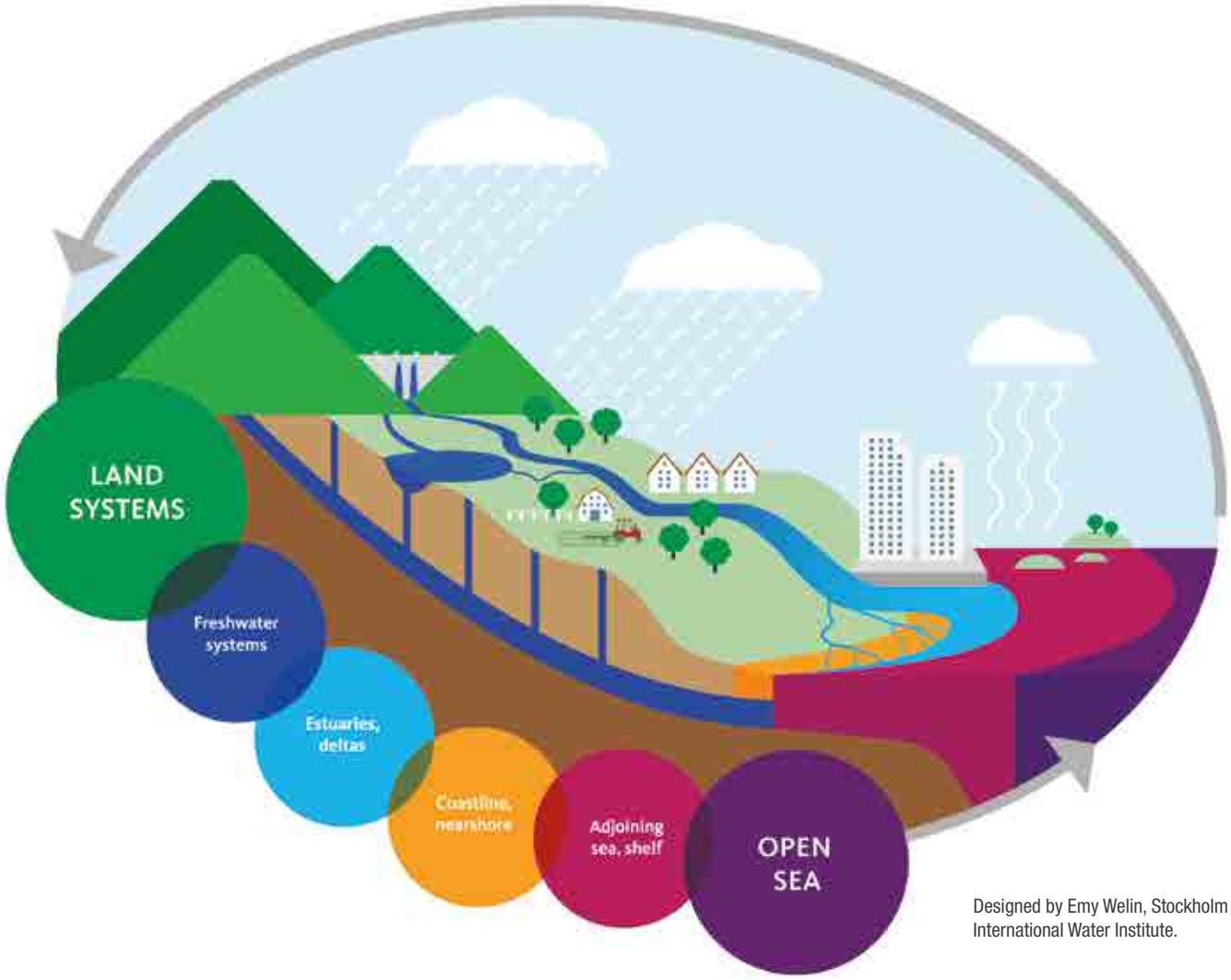
i) **social participation and capacity for collaboration** among different stakeholders;
ii) **transparency and effective communication**; and
iii) **sufficient financial resources** for the implementation of plans and programmes.

Similar conclusions were reached at the IUCN World Conservation Congress in 2016, which highlighted key points for the governance of ecosystems.[11] The Congress also emphasised the need for transparency in engaging and building trust with the actors to ensure that 'top-down' rules and regulations are informed and guided by 'bottom-up' input.

In most of the case studies of successful governance analysed (FBDS, 2017; SIWI, 2019; GIZ, 2019), the **mobilisation and engagement** of society was fundamental for the success of the governance model. In this regard, it is worth highlighting the history of social participation in the Piracicaba-Capivari-Jundiaí (PCJ) watersheds in São Paulo state,

11 For further information, please see: https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/ecosystem-governance

Figure 2
Segments comprising the source-to-sea system



Designed by Emy Welin, Stockholm International Water Institute.

Note: Arrows indicate the upstream-downstream linkages between the segments.

Source: Adapted by Rio Doce Panel based on Mathews et al. (2019, p. 8).

BOX 1

Case study: Social participation in the Piracicaba-Capivari-Jundiaí River (PCJ) Watersheds (Brazil)

Social movements started in the 1960s in Piracicaba (São Paulo State), mainly as a reaction to the massive fish mortality in the Piracicaba River caused by the increasing industrialisation in the region, demographic growth and large amounts of effluents discharged into rivers. Subsequently, dissatisfaction was aggravated by the implementation of the Cantareira water supply system in the 1970s, which reversed a considerable outflow of water resources available in the region.

The social mobilisations culminated in the formation of the *Consórcio PCJ* (PCJ Consortium). Established in 1989, the consortium is a non-governmental body that brought together governmental agencies, the private sector and civil society to engage in building policies and institutions that would improve the quality of the PCJ rivers and their water resources. PCJ Consortium is an independent body which is not linked to any public regulations. The foundation of the entity's work is to raise awareness among all sectors of society about all water-related resources in the region, including planning and promoting actions to recover water sources.

The consortium served as the main body and watershed agency before the creation of the current PCJ Watershed Committee, in accordance with Brazil's 1997 National Water Resources Policy. The consortium still exists with its own planning; for the 2019–2020 biennium, for example, its priority action was to increase the region's resilience in the face of extreme weather events due to climate change (Consórcio PCJ, 2019).

which was aimed at solving water pollution problems (Box 1). Set in the 1960s and 1970s, their mobilisation created a solid structure of participation of the various stakeholders. It served as a basis for the development of the State Policy of Water Resources of São Paulo, which preceded the National Policy of Water Resources.

The integration of the watershed committees with the PCJ Consortium also seems to be an example to be followed in the case of participatory governance in Brazil. Box 1 presents a summary of this case study of successful social participation in the watershed governance in Brazil.

The capacity for collaboration among different stakeholders is another key issue for the establishment of a responsive governance. Responsive governance is defined by the United Nations as:

> "Responsive public governance requires responding efficiently and effectively to people's real needs. This entails a resolve to anchor policies, strategies, programmes, activities and resources, taking into account people's expectations, with particular attention paid to local variations and ambitions" (UNDESA, 2015, p. 27).

According to Young (2013), there are different types of leadership for improving collaboration: i) cognitive leadership is the ability to come up with new ways of thinking about key issues; ii) entrepreneurial leadership is the ability to make deals achieving mutually acceptable agreements; and iii) structural leadership is the ability to attract influence of powerful actors in a constructive manner. Independently of the type of leadership applied, it is important that at least some stakeholders in the governance scenario have this capacity (Young, 2013). Where collaboration among different stakeholders is essential, it can be led by individuals who have the ability to influence key decision makers.

Nonetheless, there is a tendency among some observers to underestimate the influence of individuals (Young, 2013). One such example is the creation of the Sydney Harbour Manager (SHM), in Australia (Smith, 1998), where one person empowered by different governmental institutions achieved credibility among the different stakeholders in the region. The SHM set up networks of interest and coordinated the dialogue between different actors solving issues of lack of coordination and conflicts of interest. After three years, whereupon the main social conflicts in the bay had drastically decreased, the SHM project was ended by the state government. Currently, the governance of the region is carried out by different public bodies in a decentralised manner, but with wide participation of civil society (Smith, 1998).

Another example of encouraging leadership among project-affected people is provided by the Serra do Mar Project in the State of São Paulo (see Box 2). The aim of the project was to move people from high-risk, irregular settlements (favelas) situated inside the Serra do Mar State Park to permanent housing outside the park.

Transparency and effective communication have also proved to be essential for stakeholder engagement and the implementation of a responsive governance. The case of San Francisco Bay (FBDS, 2017), in the United States, stands out as an example of a totally decentralised governance model based mainly on efficient communication of the various institutions that operate in the bay area. In a governance networks model, the various institutions and stakeholders of the bay interact establishing a responsive governance for achieving good results for the region. Another compelling example is the communication and transparency achieved in the Chesapeake Bay, also in the United States. Unlike San Francisco Bay, the Chesapeake Bay has a centralised system of governance with a focal point in the Chesapeake Bay Programme (CBP), which is a governmental body that manages the waters of the bay and ensures a high level of participatory governance (FBDS, 2017). Box 3 explains more in detail the tools CBP uses to ensure transparency and communication.

BOX 2

Case study: Encouraging leadership while relocating people from high-risk settlements inside the Serra do Mar State Park, São Paulo (Brazil)

This project is financed by the Inter-American Development Bank and jointly managed by São Paulo State institutions: the *Companhia de Desenvolvimento Habitacional e Urbano* (Urban and Housing Development Company, or CDHU) and *Fundação Florestal* (Forestry Foundation), the state agency responsible for protected areas. The project has offered training courses for community representatives elected from each of the neighbourhoods to be resettled (Perivier et al. 2016).

The representatives offer a point of contact between the affected families and the project, explaining the details of the project and responding to the affected families' questions and concerns with the support of project staff. They work in parallel with the local offices, manned by CDHU social workers, that have been set up in each of the project-affected neighbourhoods. The Serra do Mar Project has also promoted a series of cultural, educational, environmental and income-generating programmes that have helped improve relations between the affected people and project staff (Coen, 2017). The project, which is still active, has resettled over 4,000 families and is in the process of urbanising the neighbourhoods where a further 2,000 families lived.

For further information, please visit the following websites: http://www.cdhu.sp.gov.br/programas-habitacionais/requalificacao-habitacional-e-urbana-e-inclusao-social/recuperacao-socioambiental-da-serra-do-mar; and https://publications.iadb.org/publications/english/document/Serra-do-Mar-and-Atlantic-Forest-Mosaics-System-Socio-Environmental-Recovery-Program-Brazil.pdf

BOX 3

Case study: Communication and transparency in the Chesapeake Bay (United States)

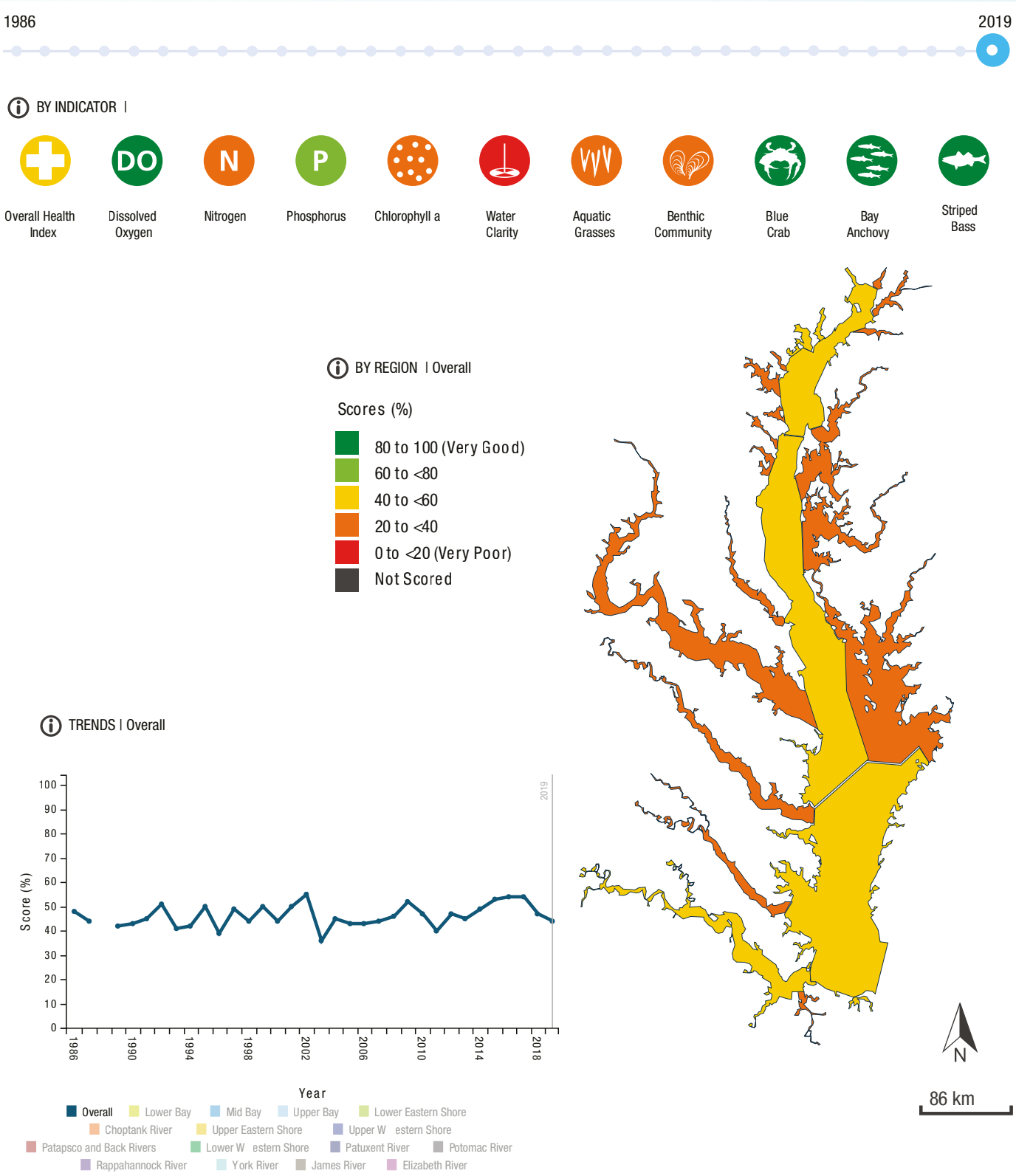
The Chesapeake Bay Programme (CBP) is responsible for management of the Chesapeake Bay and uses a series of tools to monitor its work, improve information sharing and decision making. These tools are:

– Chesapeake Progress: which monitors environmental quality, recovery and financing;
– Chesapeake Decisions: a platform to help adaptive management; and
– Chesapeake Data: data that influences decisions taken by CBP.

The websites of CBP and the US Environmental Protection Agency (EPA) offer a wealth of easily accessible information. CBP meets in open meetings and promotes public hearings to communicate with civil society as necessary. In addition, CBP recognises the importance of effective and transparent communication with society to ensure control and monitoring of its activities and educational programmes, which provide the basis for the long-term recovery and success of the bay, supporting the work of the Chesapeake Bay Foundation (the main Chesapeake Bay NGO) and other NGOs active in this cause.

It is noteworthy that CBP has created a methodology to produce 'Report Cards' based on 12 indicators of ecosystem health in each of the 20 sub-regions of the bay and inflowing rivers. This user-friendly information is regularly updated and reported to a large audience, making it easier for people to assess performance and achieve goals over time. The Report Cards are managed by the University of Maryland, which ensures independence in dissemination of the information. Figure 3 shows an example from the Chesapeake Report Cards website. Information is also distributed through printed newsletters and other means of communication (University of Maryland, 2020).

Figure 3 – Example of Chesapeake Bay Report Cards



Source: Image extracted from Chesapeake Bay and Watershed Report Card. Provided by the University of Maryland Center for Environmental Sciences Integration and Application Network (ian.umces.edu).

Note by the editors: The report card is a tool that measures the social, environmental and economic health of Chesapeake Bay, which include: Overall Health Index, dissolved oxygen, nitrogen, phosphorus, chlorophyll ***a***, water clarity, aquatic grasses, benthic community, blue crab and Bay anchovy.

Financial resources are of major importance in the conduct of good governance. Lack of resources is one of the main obstacles to achieving successful long-term outcomes and can drastically interfere in the responsiveness of any governance structure. In Brazil, the Federal Government has been a key institution for funding hydrographic regions' plans and programmes. In other cases, other regional institutions, such as the European Union through its Water Framework Directive (WFD),[12] have also ensured the availability of adequate resources.

Although Brazil and other countries charge for water use, this alone has not been sufficient to ensure the funding for long-term programmes and projects. Thus, financial alternatives must be pursued to complement governmental funding. In Latin America, a good source of information about funds is the Conservation Finance Alliance (CFA).[13] CFA defines conservation finance as "mechanisms and strategies that generate, manage, and deploy financial resources and align incentives to achieve nature conservation outcomes" (Meyers et al., 2020, p. 4). Another potential source is the United Nations Development Programme (UNDP) Biodiversity Finance Initiative (BIOFIN),[14] which aims to deliver a new methodological framework, facilitating the identification, development and implementation of optimal and evidence-based finance plans and implementation of finance solutions (Box 4).

In the context of disaster recoveries and shortcomings, two case studies are described by Gjerde and de Silva (2018): Sri Lanka's recovery after the tsunami of 2004; and Christchurch, New Zealand, which was devastated by a series of earthquakes in 2010 and 2011.

Although using different strategies, in both cases, global approaches to design and building have been privileged at the expense of locally developed patterns and processes. This seems to lie behind a number of subsequent problems. Gjerde and de Silva (2018) thus conclude that community participation in development processes is important even though these methods alone will not lead to good governance.

BOX 4

BIOFIN – Finance Solutions Map

One of the products of BIOFIN is the Finance Solutions Map, which is an interactive online 'catalogue' that lists the instruments, tools and strategies that are applicable to different countries in the field of biodiversity finance, including Brazil.

According to BIOFIN, financial flows have grown and are significantly wider than ever. The map lists 87 types of financial possibilities, such as: climate, carbon and forestry funds; taxes, fees and royalties in the forestry sector; taxes on fuel; payment for ecosystem services; and increasingly, official development assistance (ODA).

This tool can be used by the permanent institutions of Rio Doce to identify financial resources for programmes and project implementation, or to continue ongoing programmes once the restoration efforts set out in the TTAC have been completed.

For more information, please visit: https://www.biodiversityfinance.net/solution-search-country

12 For more information, please visit: https://ec.europa.eu/environment/water/water-framework/index_en.html
13 For more information, please visit: https://www.conservationfinancealliance.org/
14 For more information, please visit: https://www.biodiversityfinance.net/

BOX 5

Case study: Beneficiary participation in a post-disaster housing project (Colombia)

The earthquake that occurred on 25 January 1999 in Eje Cafetero in Colombia had a significant impact on the departments of Risaralda, Caldas, Antioquia and Valle. The Coffee Growers Organisation, which was already well established in the region, started collecting data on the needs and priorities of the coffee growers just days after the disaster, working through the existing structure of local and regional committees. They were conscious of the risks of becoming the passive recipients of aid from government and NGOs, and took a proactive role to develop their own plans, which were later administered through the federation of regional committees. The management of the funds provided by central government was carried out by growers themselves, developing their own scheme which was designed to respond to the needs of the members of the organisation, and included loans, subsidies, technical aid and information. This was implemented through contracts between the local organisations and the beneficiaries, which also involved a housing subsidy and an additional loan.

The reconstruction was overseen by engineers contracted through the organisation, to ensure the structures were earthquake-resistant and complied with environmental and regional planning standards. The approach offered many benefits: freedom to explore a range of different solutions; encouraged beneficiaries to utilise matching funds from other sources; take a direct part in the work such as learning construction skills; and supporting a process of self-determination that allowed beneficiaries to take responsibility for their own housing projects. The technical supervision and advice provided by the engineers created a relationship that allowed the beneficiaries, many of whom had only limited formal education, to develop appropriate, low-cost solutions to the restoration process (Davidson et al., 2007).

Social engagement is a big challenge when dealing with a post-disaster situation, given that the affected communities will have suffered disruption and will initially be concerned about resolving their immediate needs of shelter, water supply, food and other basic needs. However, to ensure that these are adequately addressed and benefits are equitably distributed, effective engagement is essential to mobilise the affected population. An inclusive discussion is required as well as a common agreement on the priorities and, above all, eligibility criteria that determines who will be entitled to benefits from the emergency and restoration programmes.

In the longer-term, effective engagement is a prerequisite for being able to move from an emergency response to providing opportunities that will allow the people affected by the disaster to re-establish their communities and livelihoods without creating ties of dependency on the government and other agencies responsible for disaster relief. In this process, it is essential to ensure that all sectors of society are involved, since the priorities and perceptions of women and men, young people and the elderly, may differ significantly – all of which may be missed by the more formal structures of political representation such as the local government.

The systematic review of academic literature also analysed the significance of stakeholders in post-natural disaster reconstruction projects (Shafique & Warren, 2016), where they are considered as any group that can affect, or be affected by, the achievement of the objectives of the organisation. The review finds that managers of emergency responses are now giving more significance to sustainable reconstruction, where

post-disaster reconstruction is being considered as an opportunity for the stakeholders to build back better. The conclusions emphasise the importance of clearly identifying and defining stakeholder groups and their interests. Furthermore, the success of post-disaster reconstruction projects is determined by stakeholder engagement. However, while researchers have emphasised the need to engage with stakeholders in reconstruction programmes, these approaches have not always been implemented on the ground.

In a comparative study of community participation in post-disaster housing projects, four case studies were examined (one each from Colombia (Box 5) and El Salvador, and two from Turkey), comparing the participation of the affected people (users/beneficiaries) in the reconstruction (Davidson et al., 2007). The study applies the "ladder of citizen participation" (Arnstein, 1969), where levels of participation range: from passive acceptance (manipulation by outside interests, over which the beneficiaries have no control); through the provision of information (where they are merely informed about what will happen); to consultation about needs and wants; to collaboration, in which there is participation; and to empowerment, where affected people eventually take over the key roles involved in decision making.

Engagement Discussion Group, Acaiaca, Minas Gerais
Photo: Marcelo Matsumoto/WRI Brasil

3 Governance of the Rio Doce after the Fundão Dam failure – Who are the stakeholders?

From the perspective of a long-term source-to-sea (S2S) system, the governance of the Rio Doce involves a myriad of stakeholders from diverse institutions with different perspectives and roles.

In an ideal situation, state institutions, including the legislative, executive and judiciary, would work together to engage in governance at all levels and create a favourable political, legal and economic environment. In parallel, the private sector (investors, producers, retailers, etc.) would generate opportunities for people and manage and mitigate impacts on the natural environment, going beyond compliance and supporting the State in its efforts to implement policy. Additionally, civil society, from diverse fields of action from the academia, religious groups, community organisations, media and non-profit organisations, among others,[15] would mobilise the participation of people as stakeholders and rights-holders, as well as drive business towards more ethical approaches by changing values and consumption patterns (GIZ, 2019). If all three sectors could work together toward a common vision for the region, this would allow the emergence of more responsive systems of governance to promote desirable outcomes for society as a whole.

While the restoration of the Rio Doce cannot be expected to resolve all the systemic limitations of typical Brazilian institutions, such as overlapping or competing systems of decision-making, problems of credibility and trust, excessive bureaucracy, political patronage, lack of technical expertise and limited social mobilisation, it could, through a proactive approach, encourage a more effective and efficient relationship between government agencies and civil society.

The stakeholder map presented in Figure 4 identifies some of the key stakeholders involved in the restoration governance of the Rio Doce after the Fundão Dam disaster.

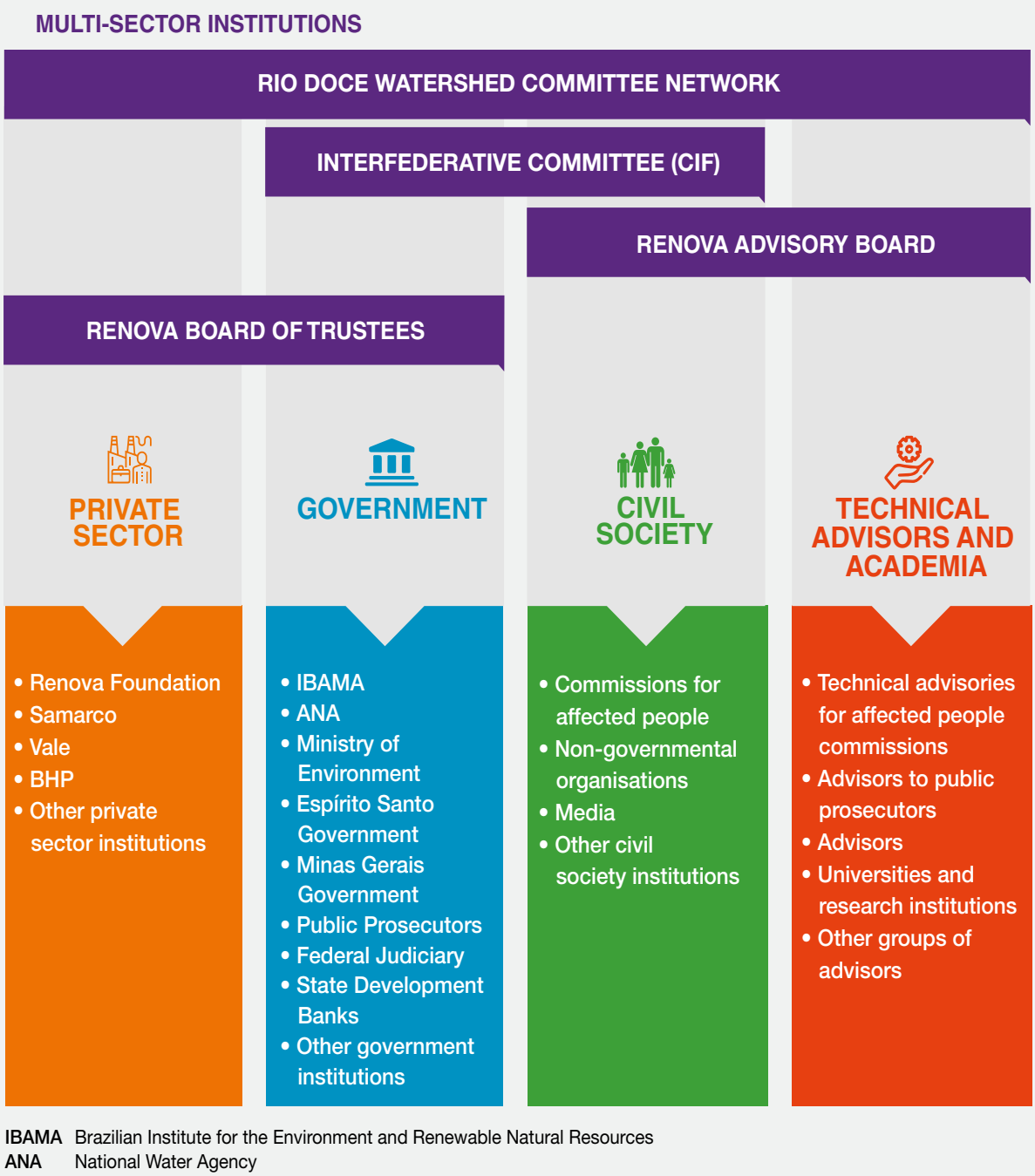
While each group of stakeholders has its own role and importance in the Rio Doce S2S governance system, CBH-Doce is the only institution that formally includes the three sectors (state, private sector and civil society) in its decision-making processes. In accordance with the PNRH, CBH-Doce has been structured in a way that allows it to be participatory and conceivably impartial in decisions related to the management of Rio Doce watershed's water resources. CBH-Doce would be able to apply a landscape approach to the governance of the watershed. State institutions as a whole, such as the judiciary and the state governments of Minas Gerais and Espírito Santo, could also play important roles in empowering the overall participatory governance of the region.

After the Fundão Dam failure, different institutions were involved in the restoration of the Rio Doce watershed (Figure 4), and a transitional governance system was inaugurated with the creation of Renova Foundation and the Inter-Federative Committee (CIF). Given the impact of the disaster, the investments that are required for the restoration, although temporary, are of such proportions that they offer a window for empowering the long-term organisation needed to achieve a more effective and responsive governance of the watershed and related coastal and marine areas. On the other hand, the restoration governance and its investments, if not well integrated with the long-term institutions, could have a negative impact on the region's overall governance long after the restoration has been completed.

A brief overview of CBH-Doce and its programmes is presented in the next sections as well as the ad hoc

15 Increasingly, these groups are forming coalitions to counteract State and private sector powers and allying with international advocacy and multilateral organisations to ensure their voices are heard.

Figure 4
The four groups of stakeholders involved in the restoration governance of Rio Doce after the Fundão Dam disaster



Source: Rio Doce Panel.

structures of the governance system created for the restoration efforts. A more detailed analysis of these structures and how they could be enhanced are also discussed.

3.1 The Rio Doce Watershed Committee (CBH-Doce)

As one of the first watershed committees to be established in Brazil, CBH-Doce is a consultative, normative and deliberative body. Its overall aim is to coordinate the activities of the stakeholders involved in the use and management of the Rio Doce watershed's resources in order to guarantee the provision and quality of those resources (CBH-Doce, n.d.).

Since the Rio Doce flows across two states, it is categorised as a federal river, and comes under the responsibility of the National Water Agency (*Agência Nacional de Águas*, or ANA) to support the process of planning the management of the Watershed, in accordance with the PNRH. This results in a complex hierarchy for management of the Watershed, involving ANA, the state agencies related to water resources, and the river Watershed committees and agencies.

At the time of this writing, CBH-Doce has 60 members, with 60 alternates: 20 from public agencies, 24 represent the water users; and 16 are from civil society. It coordinates with the National Council for Water Resources (*Conselho Nacional de Recursos Hídricos*, or CNRH), and is integrated into the National System of Water Resources Management (*Sistema Nacional de Gerenciamento de Recursos Hídricos*, or SINGREH)[16] (CBH-Doce, 2020).

The committee coordinates with the other Watershed committees of tributary rivers (Figure 5) and has established various working groups and technical boards (including a 'technical integration board') to support its activities. In 2010, CBH-Doce approved the Integrated Water Management Plan for the Rio Doce Watershed (*Plano Integrado de Recursos Hídricos*, or PIRH), which will start to be revised in 2021.

Table 1 shows some key programmes and projects currently conducted by the CBH-Doce (2020).

In July 2010, with the approval of the PIRH, CBH-Doce established a normative system for charging users for the water from Rio Doce and its tributaries. The funds generated are used to implement the committee's programmes and projects mentioned in Table 1, which are designed to improve conservation of the watershed's resources.

3.2 Ad hoc restoration agencies

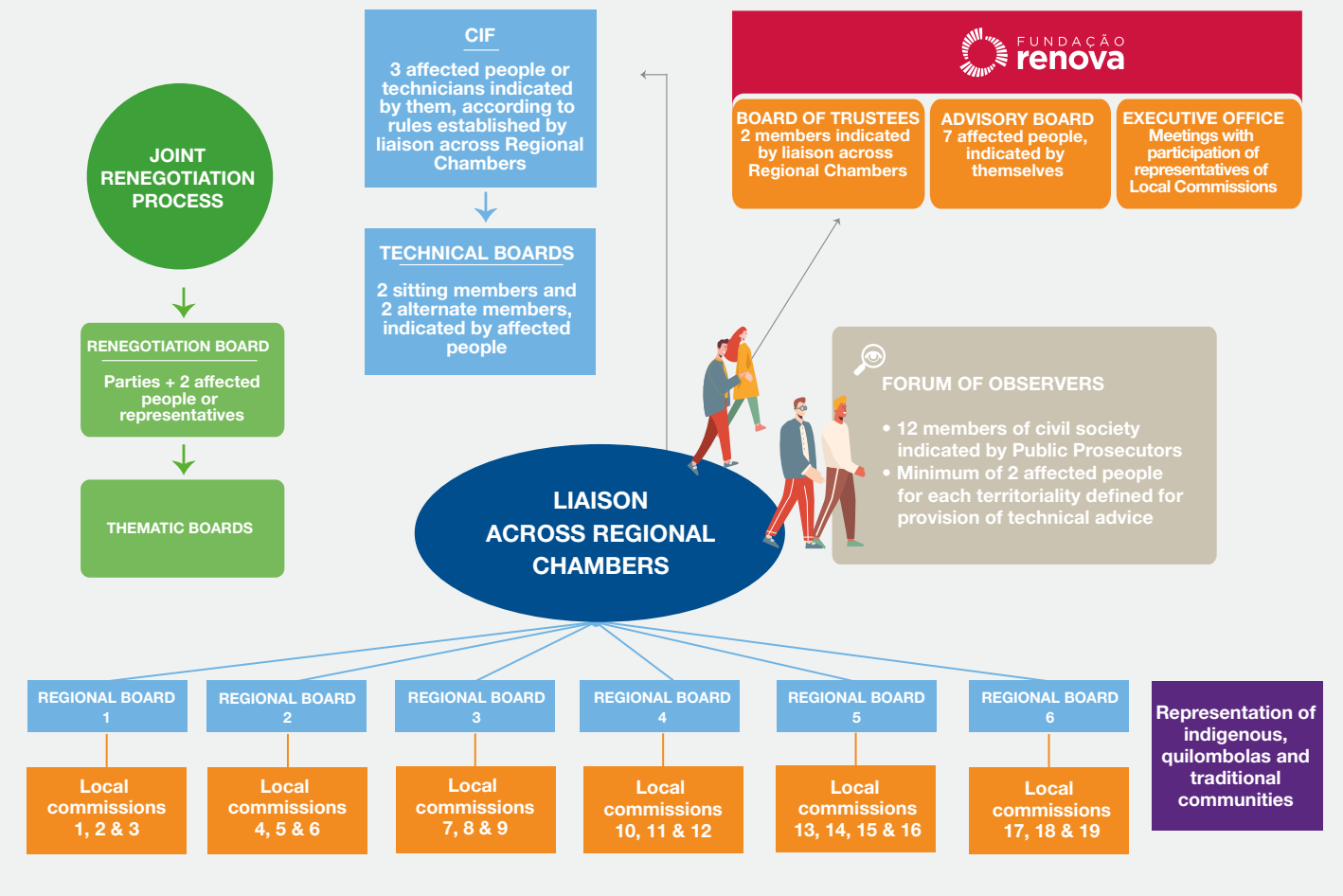
In March 2016, in the wake of the disaster caused by the rupture of the Fundão tailings dam, a governance structure for the restoration was set up under an out-of-court agreement between the mining companies responsible for the disaster (Samarco and its parent companies Vale and BHP) and key federal and state government agencies responsible for environmental and social issues. The legal framework is called the Terms of Transaction and Conduct Adjustment (*Termo de Transação e Ajustamento de Conduta,* or TTAC)[17] and involved a complex hierarchy of stakeholders (Lima et al., 2020).

The TTAC includes 42 programmes to mitigate the environmental and socio-economic impacts which were to be implemented without having to wait for judgments on the legal actions brought by the State Public Prosecutors and municipalities. The duration of the TTAC and its programmes is not set out in the agreement, since the programmes will be in effect as long as they are required. Although the TTAC offered the possibility of initiating the restoration activities

16 SINGREH is a set of legal and administrative mechanisms, designed to coordinate the integrated management of water resources of Brazil and to implement, in a participative way, according to the PNRH. SINGREH includes the National Council of Water Resources (CNRH); the National Water Agency (ANA); the state councils for water resources; the watershed committees (including CBH-Doce); and other federal, state and municipal institutions responsible for water resources management, and water agencies.

17 For further information, please see: https://www.samarco.com/en/plano-de-recuperacao-macro/

Figure 5
Participation of the affected people in the restoration governance as set out in the TAC-GOV



Source: Rio Doce Panel, adapted from MPMG (2020).

without having to wait for a final legal decision, it was drafted and agreed with little discussion or negotiation with the affected communities.

The explicit aim of the programmes is to restore the environment and socio-economic conditions to the way they were prior to the disaster of 5 November 2015, giving priority to rehousing the displaced people and restoring the livelihoods of the communities that lost their land or businesses. Within the framework agreement (2015), three transitional structures were created:

1) **Inter-Federative Committee (CIF).**[18] Its role is to define priorities for the implementation and execution of the 42 programmes, following, monitoring, validating and inspecting the results. CIF is coordinated by the Presidency of the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), and originally comprised: two representatives of the Ministry of the Environment; two other representatives of Federal Government; two representatives of the state of Minas Gerais; two representatives of the state of Espírito Santo; two representatives of the affected municipalities in Minas Gerais; one representative of the affected municipalities in Espírito Santo; and one representative of the CBH-Doce.

18 For more information, please see: https://transparencia.fundacaorenova.org/cif

Table 1
A selection of key programmes and projects currently conducted by CBH-Doce

PROGRAMME/PROJECT	BRIEF DESCRIPTION	SOURCE OF FUNDING
Rio Vivo	Investments for the recovery of springs, improvement of rural sanitation and reduction of sediments generation	Charges for water use
Reflorestar (Espírito Santo State)	Promotes environmental restoration and generates income opportunities for rural producers in the State of Espírito Santo (ES)	Participation in Reflorestar programme, ES government
Watershed Sanitation Programme	Development of projects for collection systems and treatment of domestic sewage.	Provided for in the Multi-Annual Application Plan (PAP)
Incentive Programme for the Rational Use of Water in Agriculture	Finances the installation of an 'irrigometer', an equipment that indicates parametres for irrigation.	Charge for water use
Water Producer Programme	Aims to recover strategic areas for improving the environmental quality of the Watershed through payment for environmental services for rural producers	Partners
Universalisation of Sanitation Programme	Investments in the development of the Municipal Basic Sanitation Plan (*Plano Municipal de Saneamento Básico,* or PMSB) in cities that do not have it and do not have the resources to implement it; the elaboration of projects for the optimisation of water supply systems and projects for adequate final destination of solid waste (landfills/sorting and composting units); and the preparation of studies on urban drainage alternatives for cities with more than 5,000 inhabitants.	Provided in the Multi-Annual Application Plan (*Plano de Aplicação Plurianual,* or PAP): approximately BRL 27 million from the Watershed Committees of Rio Doce
Permanent Protection Areas (APP) and Springs Recovery Programme	Promoting a survey of critical and priority areas for restoration or densification of riparian forests and hill tops, as well as to characterise and recover springs and degraded areas.	BRL 10 million from a partnership of the state of Espírito Santo, Instituto BioAtlântica (IBIO), The Nature Conservancy and Watershed Committees of CBH-Doce network
Social Communication Programme	Implementation of a specific plan to give visibility to the actions and contents foreseen in the PIRH of the Rio Doce Watershed, to facilitate contact between the various actors of the Water Resources Management System with society, and create a favourable environment for meeting the proposed goals.	Not specified

Source: Comitê da Bacia Hidrográfica do Rio Doce (Rio Doce Watershed Committee) (CBH-Doce, n.d.).

2) **CIF Technical Boards.**[19] The TTAC envisaged the possibility of providing technical support to the CIF. In July 2016, the CIF created 11 Technical Boards (*Câmaras Técnicas*, or CTs) with independent regulations, comprising representatives of the Federal, State and Municipal Governments. The CTs meet once a month to monitor and provide guidance to the progress and outcomes of the programmes; Renova Foundation staff is invited to participate. They cover:

- Waste management and environmental safety;[20]
- Forest restoration and water production;
- Conservation and biodiversity;
- Water security and water quality;
- Infrastructure reconstruction and recovery;
- Economy and innovation;
- Social organisation and emergency aid;
- Health;
- Education, culture, leisure and information;
- Communication, participation, dialogue and social control, and
- Indigenous and traditional peoples and communities.

3) **Renova Foundation** is responsible for implementing the 42 environmental and socio-economic programmes. It is a private, non-profit organisation, with approximately 600 employees (in 2020), created under the TTAC.

Renova has several decision-making instances involving multiple stakeholders and a rigorous system of internal and external controls. The foundation is governed by a Board of Trustees, responsible for the strategic management and approval of the projects, programmes, annual and multi-annual planning, budgeting and contracting. The TTAC states that it will have seven members, two from each of the companies (Samarco, Vale and BHP Billiton) and one from CIF. The Executive Office is responsible for proposing, developing and implementing the plans approved by the Board of Trustees. The Fiscal Council, also with seven members, is responsible for the financial supervision of the foundation's activities. An Advisory Board has been set up to provide technical opinions on issues and acts as a channel for the concerns of the people affected by the disaster. The TTAC states that it will have 17 members: five from the CBH-Doce; two from the Inter-Ministerial Commission for Marine Resources; five from educational and research institutions; one from the Federal Public Prosecutor's Office; one each from the State Public Prosecutors' offices; and two from the Foundation's Board of Trustees (clauses 211–220, TTAC).

In order to ensure greater participation of the affected people in the restoration efforts, the Terms of Conduct Adjustment–Governance (*Termo de Ajustamento de Conduta sobre a Governança*, or TAC-GOV), was agreed upon and signed on 25 June 2018 (MPF, n.d.). It is explicitly intended to prioritise the participation of the affected people. TAC-GOV introduces significant modifications to the institutional arrangements set out in the TTAC, including the direct involvement of the Federal and State Public Prosecutors' and Public Defence Offices in the CIF, and defines contracts with technical experts to advise the federal prosecutors as well as organise independent public hearings with the affected people (MPF, n.d.).[21]

The TAC-GOV also proposes several new structures and modifications to the existing arrangements, such as:

- **Nineteen local commissions** to represent the affected people supported by their technical advisors, to present comments and proposals related to the restoration;
- **Six Regional Boards**, with representatives nominated by the local commissions, including

19 For more information, please see: https://transparencia.fundacaorenova.org/cif/regimento-interno (in Portuguese).
20 For the complete document regarding the Technical Boards, please see: http://ibama.gov.br/phocadownload/cif/regimento-interno/cif-regimento-unico-2018.pdf (in Portuguese).
21 The Federal Prosecutors had already contracted specialists to support the Rio Doce Task Force. The findings appear to have had a significant input into the final version of the TAC-GOV (see Parecer No. 279/2018/SPPEA at http://www.mpf.mp.br/grandes-casos/caso-samarco/documentos/parecer-no-279-2018).

representation of indigenous, quilombolas[22] and traditional communities;

- **Forum of Observers**, which is an advisory body that will support the experts hired by the Federal prosecutors. It should include representatives from civil society, academia and affected people; and
- **Modification in the composition of CIF and the Technical Boards** incorporating four additional members: one from the Federal Public Defence Office, and three representatives of the affected people or advisors nominated by them.

TAC-GOV envisages the renegotiation of the original 42 programmes involving the Public Prosecutor's Office, mining companies, Federal Government, the State Governments of Minas Gerais and Espírito Santo, and the people that have been affected. The renegotiation should be based on the participation of the affected people, as well as the technical studies carried out by the independent experts contracted by the Public Prosecutor's Office and the studies carried out by the Renova Foundation.

Figure 5 shows the modifications set out in the TAC-GOV, including the central role of the six Regional Boards.

Although the TAC-GOV was signed in June 2018, its implementation is still incipient. Hiring of the technical advisors to assist the affected communities in the organisation of local commissions has yet to be concluded. The main obstacle is the failure to achieve agreement among the various actors involved, including the public prosecutors, public defenders, NGOs, the companies and the affected communities. Those local commissions that are functioning were established with support from the public prosecutors and municipalities soon after the disaster and before the TAC-GOV was signed. Under TAC-GOV, the local commissions should provide the basis for the regional commissions and boards. The lack of technical support makes it difficult for the affected people to organise themselves and define their priorities and positions.

On 19 December 2019, the public prosecutors filed a legal action in the 12th Federal Court against Samarco, Vale, BHP and Renova Foundation in response to the slow pace of the implementation of the 42 TTAC programmes. The legal action addresses priority or emergency areas essential to ensure implementation of the repair and indemnification programs. As of December 2020, 13 areas have been defined as priorities for deliberation by the judge, with information provided by Renova, CIF, public prosecutors and external consultancies (FEAM, n.d.; MPF, 2019):

1) Restoration of the river channel and banks;
2) Risks to public health and the environment;
3) Resettlement of the affected communities;
4) Infrastructure and development;
5) Restoration of Risoleta Neves Hydroelectric Plant (UHE) – Candonga;
6) Monitoring and supervision;
7) Census and compensation of people affected by the disaster;
8) Restoration of economic activities;
9) Drinking water supply;
10) Contracts to provide technical advice;
11) Support for municipal-level health services due to the Covid-19 pandemic:
12) Re-discussion of 2017 IEF Ordinance No. 4023 regarding prohibition of fishing in the Rio Doce watershed in Minas Gerais;[24] and
13) Restructuring of the Internal Organizational Management System of the Renova Foundation.

22 Quilombolas are descendants of African slaves whose ancestors during the period of slavery fled to remote places to live freely and in accordance with their cultural heritage.
23 For further information about the IEF (*Instituto Estadual de Florestas*) Ordinance (2017), please see: http://www.cbhdoce.org.br/wp-content/uploads/2017/09/Portaria-40_IEF_2017.pdf
24 The information about axes 11 and 12 was provided by Renova technical teams during meetings with the Rio Doce Panel held in 2020 while this report was being produced.

4 How can the restoration efforts contribute to the sustainable governance of the Rio Doce source-to-sea system?

In this section, the report focuses on the need to support the long-term governance of the region in a source-to-sea system, taking into account the conditions required for an integrated system of governance. The analysis is based on the structural axes described in section 3, and the Panel's knowledge of the current situation in the Rio Doce Watershed (developed on the basis of regular meetings with different stakeholders and review of publicly available documents). In particular, the Panel's first Thematic Report (Sánchez et al., 2018) addressed governance in the context of the challenges to delivering sustainable and resilient mitigation of the social and environmental impacts of the dam failure. Likewise, the Panel draws on the governance frameworks proposed in available literature (Puga et al., 2020; SIWI, 2019; FBDS, 2017; GIZ, 2019; Campese et al.; Lavalle et al., 2019; Young, 2013; Nielsen, 2016).

In practical terms, the current structure of restoration governance needs to support the long-term governance along the three structural axes mentioned in section 4: i) engagement, social participation and promoting synergies between stakeholders; ii) the role of transparency and effective communication in good governance; and iii) providing adequate financial resources for plans and programmes. But what happens next?

As the restoration programmes go forward, appropriate measures will have to be taken simultaneously to ensure that all the structures that have been set up, studies undertaken, data and results obtained and information systems established, especially the capacity developed, are preserved and eventually absorbed by the permanent governance structures. This will guarantee their sustainability (continuity) and a smooth, effective transfer of information, knowledge and responsibilities from the restoration processes to the region's existing long-term system of governance.

4.1 Strengthening stakeholder engagement and synergies between stakeholders

The participation of the people affected by the disaster is essential to ensure that the resources invested in the restoration programmes are used effectively and respond to their priorities. This is a prerequisite for achieving the overall aims of remediating, restoring or compensating the impacts caused by the rupture of the Fundão Dam. Moreover, participation is important for leading the sustained improvement in the environment, standards of living and livelihoods of people in the affected areas and in the Rio Doce watershed as a whole. Empowering the population of the region with a view to achieving long-term responsive governance calls for effective social organisation, engagement and stakeholder participation.

Before the TAC-GOV was signed, the direct participation of the affected people was limited to the public hearings (clause 61 of the TTAC) which, according to the public prosecutors of the State of Minas Gerais,[25] was insufficient. Public hearings require a certain level of social organisation to be effective. However, even if well conducted, public hearings do not necessarily ensure the effective participation of all sectors of the affected population. Once the TAC-GOV is fully implemented, the public hearings can be better organised. The affected

25 For further information, please see: http://www.mpf.mp.br/grandes-casos/caso-samarco/duvidas-sobre-o-tac-governanca

groups and sectors are expected to participate extensively and, when necessary, supported with technical assistance. In addition, the TAC-GOV foresees several mechanisms for the participation of the affected people throughout the entire decision-making process, which goes beyond public hearings. This could offer long-term benefits for the region if citizens are well organised and understand how to participate effectively in the decision-making processes needed to achieve a desired future. The long-term institutions of governance will be more effectively engaged and supported in the restoration process if they can count on the participation of all sectors of society.

With regard to CBH-Doce, there are several overlapping programmes and projects, that could be more closely integrated with the restoration efforts being put in place by Renova. These include the initiatives for improving sanitation, recovery of springs or payment for ecosystems services (PES), as well as support for outreach capabilities and empowerment of the actors to take on the long-term governance.

Figure 6 presents the ideal situation where synergies exist between all sectors, leading to responsive governance.

As it appears from the diagramme, responsive governance could contribute to re-engaging with communities, motivating and helping them organise to achieve a common vision and shared goals. Accordingly, it would facilitate compliance with current international standards for the kind of social and environmental impacts generated by infrastructure and urban redevelopment projects. The World Bank alludes to such results, stating that one of the objectives of its Environmental and Social Standard 5, Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS5) is:

> "To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure" (World Bank, 2017, p. 54).

For that purpose, the 'baseline' from which the restoration is developed has to be grounded on a rigorous, informed and, where appropriate, scientific analysis of the situation in the region and established through systematic engagement with the affected communities and other key stakeholders.

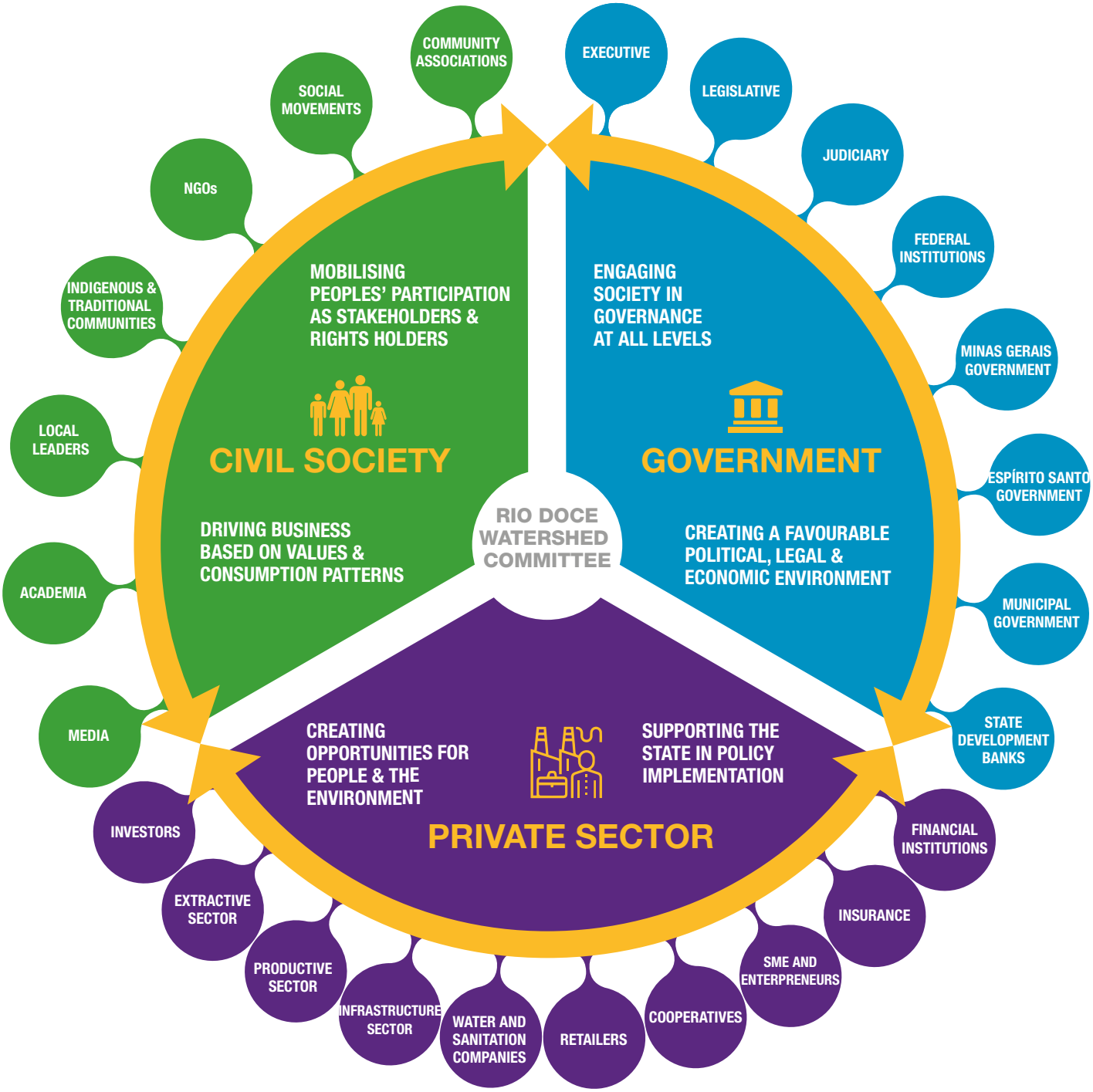
The CIF-Renova system is already engaging the TTAC programmes with permanent institutions, such as the CBH-Doce in some cases. One example, is the Sustainable Land Use programme. The Renova Foundation has constituted structures known as "regional management units" and "local monitoring units" that involve the participation of key actors from the Watershed: CBHs, IBAMA, the MG State Forest Institute (*Instituto Estadual de Florestas*), the Minas Gerais and Espírito Santo Agriculture and Environment Secretariats, agricultural development agencies in the States of Minas Gerais and Espírito Santo, the agricultural and forestry defence institute in Espírito Santo, city halls, and representatives of producers and rural workers. All the stakeholders participate in decision making in relation to the forest restoration programmes and the PES project.[26]

4.2 The role of transparency and effective communication in good governance

To be effective, a participatory process of the kind that is needed in the areas affected by the disaster must have clearly defined objectives and mutually-agreed rules. Otherwise, it runs the risk of leading to endless demands, typically for short-term solutions, without any substantive discussion of the long-term

26 The information about this governance arrangement was provided by Renova Sustainable Land Use team and other stakeholders during meetings with the Rio Doce Panel held in 2020 and 2021 while this report was being produced. More information about the creation of the regional management unit can be found at Renova's 2018 activities report (p. 175) at: https://www.fundacaorenova.org/wp-content/uploads/2019/01/renovaanual-1.pdf (in Portuguese only).

Figure 6
Schematic diagramme showing responsive governance through collaboration and stakeholder engagement



Source: Developed by Rio Doce Panel, based on GIZ (2019, p. 13).

vision or objectives of the people and communities affected. This requires maturity, sensitivity and acceptance of responsibilities by all sides.

Communication is an essential prerequisite for stakeholder participation. It goes beyond the provision of information and should be considered as a process to ensure that the affected people and other relevant parties are properly informed about the critical concerns they face, avoiding communications that only bring good news or a one-sided vision of the situation. This means presenting issues in a language that is easily understood, and recognising or accepting that there will be differences of opinion on complex technical issues.

Similarly, scientific discussions and decisions require the involvement of different disciplines and institutions as well as the inclusion of more contextualised, local and lay knowledge (EEA, 2002).

Improved communication is essential to strengthening the current structure for governance. It will facilitate engagement with stakeholders and could help resolve some long-running disputes. In its existing structure, Renova has 15 local offices (nine in Minas Gerais and six in Espírito Santo), which are described as information and service centres. With this structure available, there may be advantages in delegating greater authority to the local offices, for example by making them responsible for the coordination of most activities in the field and, once they are established, by encouraging day-to-day, local-level coordination with the committees and regional councils envisaged in the TAC-GOV.

4.3 Providing adequate financial resources for plans and programmes – What happens next?

The process of establishing an appropriate and effective system of governance takes time and requires a measure of mutual confidence. It must build on and be fully supported by the programmes of restoration that the Renova Foundation is responsible for implementing. Over the longer term, however, the investments and infrastructure created by these programmes will eventually have to be transferred to the corresponding agencies. It will, therefore, be important to initiate a transitional process that will allow the permanent institutions of government (or in some cases, civil society) to take over responsibility for managing the programmes, as appropriate.

This will require, first, an analysis of each of the programmes contemplated under the TTAC to agree on the protocols that will determine when each programme can be regarded as having been completed and can be signed off. The second step is to ensure that adequate financial and other resources are made available to the agencies that will take responsibility for the programmes or investments that will require long-term funding. This is essential to ensure the proper operation and maintenance of investments in infrastructure, and the continuity of other programmes covering areas such as water monitoring, data management, communications, the provision of technical assistance, support for small businesses and so on.

Renova is already transferring responsibility for the implementation of some programmes to permanent institutions, which is a good beginning of a formal process of transition.

Rural producers receive training in partnership between Renova Foundation and WWF. Governador Valadares and Periquito, Minais Gerais (2019).
Photo: Leonardo Vieira Morais/WWF-Brasil

One example of this transfer is the BRL 600 million programme for solid waste management and the collection and treatment of sewage (P31).[27] These funds are transferred to the municipalities, through a reserve that was created to finance specific projects, once they have received approval. This kind of initiative could offer a model for more permanent funding mechanisms involving different financial agencies.

Another example is the *Agenda Integrada* (Integrated Agenda) initiative, which will allocate approximately BRL 830 million for investments in education, infrastructure and health in the 39 municipalities most directly affected by the disaster. This initiative is managed by the Renova Foundation and the state governments of Minas Gerais and Espírito Santo, with the participation of the Forum of Mayors of Rio Doce. In this joint effort, the compensatory resources from the Renova Foundation are being applied to infrastructure projects designed to have a long-term positive impact in the Rio Doce watershed.

27 For more information: https://www.fundacaorenova.org/wp-content/uploads/2020/06/jornadabaixoriodoce23062020.pdf

5 Conclusions

Based on the analyses presented in this report, the Panel understands that there are a number of TTAC programmes that overlap with the programmes of the existing permanent institutions in the region such as CBH-Doce.

The TTAC was developed in response to the immediate crisis caused by the disaster, with insufficient time devoted to assessing on-going projects in the region or to organising and engaging with the affected people and ensuring their active participation. Although the TAC-GOV was signed in 2018 with the objective of creating a more participatory process for managing the restoration efforts, its implementation is still incipient and has been overshadowed by the legalisation of the decision-making process. Moreover, the TTAC does not include a strategy for the transition to a post-Renova era, when the permanent institutions will have to take on the responsibility for the continuation of different programmes and projects.

In the context of the source-to-sea system, CBH-Doce is a key institution in promoting water governance. It engages with a wide range of stakeholders and could play an important role in the restoration of the region. Greater involvement in the restoration process would offer an opportunity to enhance CBH-Doce's leadership and effectiveness in the governance of the region.

Finally, while there are some initiatives to collect, preserve and disclose the information related to the restoration process, these are sporadic cases. There is a need for a broader strategy to systematise, organise and improve the way data is generated, disclosed and communicated to the public. This is important to enhance stakeholders' participation and to ensure long-term community empowerment through the restoration efforts.

Recommendations

In light of these findings, and drawing on the recommendations of the previous thematic reports and issue papers,[28] the Rio Doce Panel proposes that the Renova Foundation, CIF and other key stakeholders support the long-term governance of the Rio Doce source-to-sea system by implementing the following recommendations:

28 Available at: https://www.iucn.org/rio-doce-panel/resources

Recommendation 1

Build a common vision for the Rio Doce source-to-sea system

There is a need to agree on a **common vision for the sustainable future of the Rio Doce source-to-sea system**. This should be built through a participatory process involving local communities and other stakeholders in the restoration process. An important step would be for the institutions involved in the restoration to work together to leverage greater stakeholder participation as envisaged in the TAC-GOV. Once achieved, it could offer an opportunity for Renova Foundation and CIF to engage more effectively with community organisations, NGOs, local governments, universities and other relevant stakeholders to discuss and agree on a long-term vision for the restoration of the region and the wider source-to-sea system affected by the disaster.

Recommendation 2

Prepare for the transition to the post-Renova era

Since the Renova Foundation is not responsible for the long-term development of the region, the foundation, State Governments and the CIF should agree on the **process and arrangements needed to achieve the eventual transition to a post-Renova era**. This should be part of the renegotiation of the TTAC and include the following steps: (i) definition of the priority programmes to ensure their continuity; (ii) engage with stakeholders to ensure continuity during the transition and post-Renova era; (iii) undertake a study of long-term alternatives to ensure adequate financial resources are available once Renova has completed the restoration programmes and activities envisaged in the TTAC and its renegotiations; and (iv) carry out a process to engage communities in the monitoring of the outcomes of the restoration.

Recommendation 3

Create a repository of data, information and documents

The Renova Foundation, with support from the CIF, should identify and develop one or more mechanisms to maintain and update the data, information and documents generated by TTAC programmes and all the related studies. **This repository should include simplified documents, videos and podcasts, to inform the general public about the data and studies developed by Renova's programmes as well as other studies related to restoration.**

Recommendation 4

Further engage the Rio Doce Watershed Committee in the restoration efforts

Further engage the Rio Doce Watershed Committee in the restoration efforts. Renova Foundation and CIF are encouraged to **support the Rio Doce Watershed Committee (CBH-Doce) to play a stronger role in the restoration process**. Since CBH-Doce is the multi-stakeholder organisation charged with promoting and improving water governance in the Rio Doce watershed, its effective participation in the restoration process will help ensure the sustainability of the long-term programmes.

As a starting point, the following short-term measures can be implemented:

- Engage with CBH-Doce to align the Integrated Water Resources Plan for the Rio Doce Watershed with the restoration efforts. The plan is currently under review and expected to be completed in 2021.
- Support the resumption of the CBH-Doce water quality bulletins to provide clear and accessible information that can be easily understood by the general public.
- Support the integration of coastal area management into the activities of CBH-Doce to incorporate the source-to-sea system in plans for the region's development.

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