Analysis of the Rio Doce Panel's Impact

2017 - 2022

Report prepared by Joao Leal and Florian Reinhard

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Content

Part I – Introduction

The Rio Doce Panel (RDP), a multidisciplinary Independent Scientific and Technical Advisory Panel (ISTAP) composed of a broad range of specialists, was established in July 2017 by the International Union for Conservation of Nature (IUCN) to provide scientific and technical advice to the institutions involved in the restoration process of the Rio Doce basin, with a long-term holistic view to the issue. The heterogeneity in the composition of the RDP was reflected in its broad scientific production, with themes as diverse as fishing and political governance addressed in its publications. From October 2018 to November 2022, the RDP published five Thematic Reports and five Issue Papers, with 33 recommendations for restoring the Rio Doce basin.

At project inception, IUCN developed a Monitoring, Evaluation and Learning (MEL) strategy around key questions, tools, and indicators to track, understand and learn from the influence and impact of the RDP products and recommendations on its target audiences and any unexpected outcomes. The MEL strategy also aimed at helping the RDP make sense of the evidence gathered to meet adaptive management and learning objectives.

As the RDP ended its operations in December 2022, this report will provide an overview of its impact on the reparation efforts and answer the question, **"What impact RDP had on how its audience undertook their core activities, and how lasting are these change likely to be?"**. It is important to point out that RDP had a lasting influence on several stakeholders involved in the reparation process, but that this report mainly focuses on Renova Foundation (RF) due to its central position in the reparation process and the constant back-and-forth in more than five years of institutional relationship with IUCN, which allowed a more nuanced level of analysis.

To answer the above question, four indicators will provide the basis for this analysis, with additional inputs extracted from the end-of-project evaluation and interviews made by the IUCN MEL officer. These indicators are:

i) **Citation Metrics** are valuable proxy indicators that allow a deeper comprehension of the academic impact the RDP had and have on its peers' scientific production. It shows which of the RDP's products were cited in other papers, when these citations occurred and if the RDP had more impact on the national or international level.

ii) **Download metrics** measure the monthly downloads for each Thematic Report (TR) since its publication. It provides insights about the RDP's outreach and the seasonality of the RDP's knowledge uptake. It allows inferences about how these documents were used and by whom.

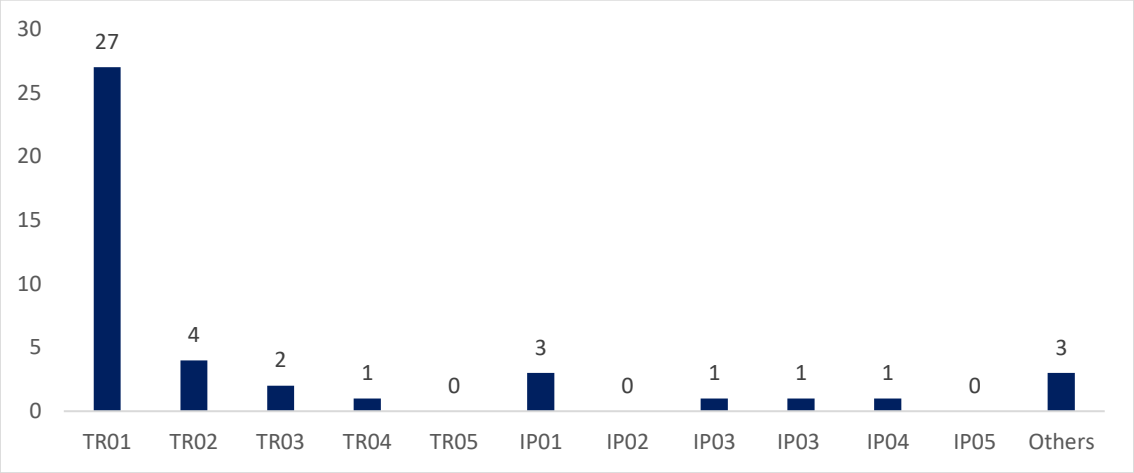
iii) Since the Renova Foundation (RF) was the RDP's donor and main stakeholder in the reparation process, **RF's feedback metrics** are a valuable quantitative and qualitative tool to understand how the Foundation understood the RDP's work, how it acted upon the RDP's 33 recommendations, and which documents resonated more with the Foundation.

iv) Finally, the **Impact Log** was used to track mentions of the RDP's influence and the repercussions of its recommendations. The purpose of this tool was to help capture instances of expected and unexpected behaviour changes among different audiences for which a correlation with the work of the RDP could be established. In this sense, it helped to understand how the RDP's work reverberated in Renova and different stakeholders.

I. Citation Metrics

IUCN Secretariat catalogued the citations of TRs and IPs in scientific articles, book chapters and postgraduate, master, and PhD theses using a wide net of alarms and searches through Google Scholar, specialised academic sites (such as Research Gate), and other research tools, such as Altmetric. It was possible to find 43 references to the RDP's work from 2018 to the beginning of 2023. Graph 1 shows that TR01 was the most cited Report, with 27 citations (61%), followed by TR02 and IP01. Neither TR05, which was only recently published, nor IP02 and IP05 have been cited so far. The column "Others" refers to academic mentions of the RDP, its function and work, but without citing any specific document.

Graph 1 – Citations per document

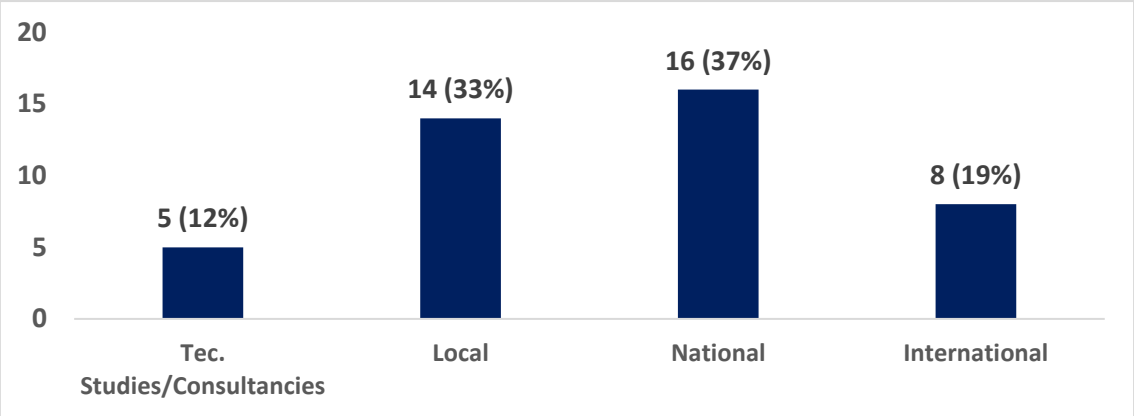


Different types of institutions that cited the RDP's academic work were identified. Graph 2 shows the number of citations made by universities and research institutes at local (from Minas Gerais or Espírito Santo), national (Brazilian institutions located outside these two states), international levels, or references made by trans-national consultancies (such as WRI).

The Federal University of Ouro Preto was the university that most often cited the RDP's documents (eight times), followed by USP, UNICAMP and UFPR (three times each). As Graph 2 points out, the work of the RDP has been most often cited at the local and

national levels than at the International level, albeit the lack of broader research data limits this analysis.

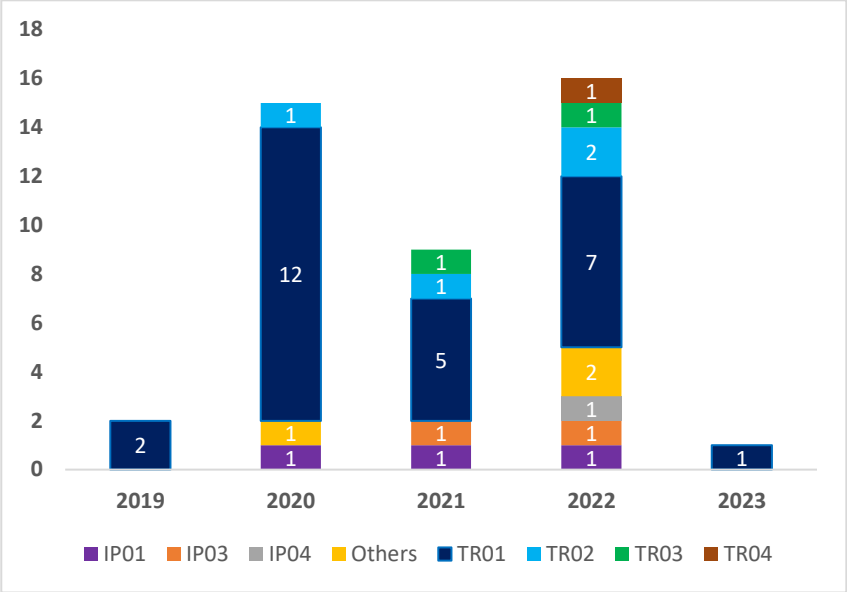
Graph 2 – RDP Citations by Type of Institutions



Among the international institutions, academics from Canada, UK, France, Germany, Portugal, Australia, and Serbia have cited RDP's work. International scholars cited TR01 to a lesser proportion than local academics. Empirically, researchers from Portugal and Germany did a deeper analysis of TR02, analysing the vulnerability and impacts climate change will have on the watershed than their peers in Brazil, which used the report more descriptively.

Two reasons might explain why TR01 was significantly more cited than the other Thematic Reports. First, because it was published in 2018, TR01 was more likely to be used as a source for scientific articles that went through peer-revision, a timely process. In fact, most citations of TR01 occurred in 2020, as shown in Graph 3. From 2022 onwards, citations of the RDP's work became more varied, which might indicate that the uptake of TR03, TR04 and TR05 by academia could increase in the coming years if we consider that these reports were only recently published. This fact that RDP’s documents were less cited by technical consultancies directly involved in producing knowledge for RF in the last two years than by universities outside of the directly affected areas, from states such as São Paulo, Rio de Janeiro, Rio Grande do Sul and Paraná seems to also confirm this hypothesis.

Graph 3 – RDP Citations per Year and Document



Secondly, an analysis of the context in which TR01 was mentioned revealed that most of the citations used the Thematic Report to characterise the disaster or its socio-environmental impacts. This introductory and descriptive character of TR01 meant that it could potentially inform papers in several areas of knowledge, such as mining, impact assessment, tourism, ecology, biodiversity, health, and others, which other TRs couldn't do due to the more narrowed focus of their content on a specific thematic. However, the growing interest in specific topics covered by these Thematic Reports might boost their citation numbers in the future. Possible examples include the growing trend of climate change studies in recent years and the ongoing renegotiation process, which affects the current reparation governance structure.

II. Download Metrics – Thematic Reports

Combined with the other indicators, the number of monthly downloads is a valuable metric that can capture the variation of interest in the RDP work over time. It also helps identify patterns in terms of outreach and uptake.

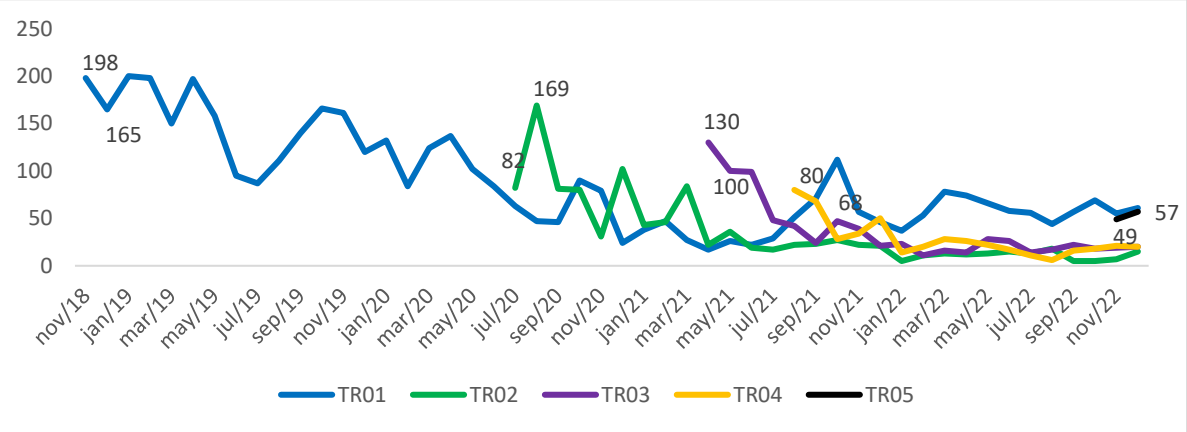
Table 1 shows the number of downloads for each Thematic Report since its publication in Portuguese and English. The first Thematic Report is the most downloaded publication by some margin, representing 66% of all downloads. In a language comparison, English versions top Portuguese for every paper, despite the 8% difference not being substantial. The sole exception is TR05. This can be explained by the fact that the Report was published only two months ago and that the Portuguese version typically has higher launching peaks than the English one.

Table 1 – Download Metrics for Portuguese and English

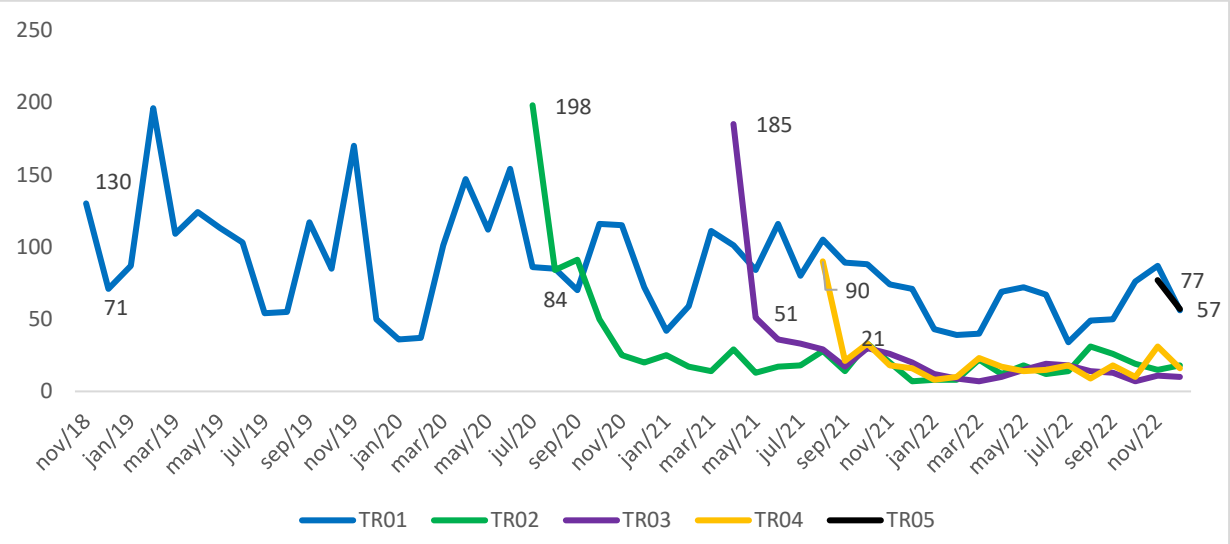
PUBLICATION	PT	ENG	MONTHS
TR01	4297	4409	50
TR02	906	1059	30
TR03	572	778	21
TR04	367	479	17
TR05	134	106	2
Total	6276	6831	50

Graphs 4 and 5 show the variation in the number of downloads through the RDP's lifespan for English and Portuguese versions of each document, respectively. The Graph also includes the numerical downloads of the first two months after the publication of each Thematic Report for reference.

Graph 4 – Monthly Download Metrics for Thematic Reports (English – 18-22)



Graph 5 – Monthly Download Metrics for Thematic Reports (Portuguese – 18-22)



Graphs 4 and 5 show interesting knowledge uptake patterns. First, it is possible to observe boom-and-bust patterns for every document download number, a trend more observable in Portuguese downloads. When cross-referencing this pattern with past dates of events that IUCN held, it is possible to observe an increase in the number of downloads in months with webinars or related events. For example, TR01's best months in 2022 were May and June, which preceded a webinar on June 20. Another recurrent pattern in the data is that number of downloads increased in October and November, the months that mark the anniversary of the Mariana disaster. Data in Table 2 points out a 36% average increase in TR01 downloads in English and 27% in Portuguese when comparing the average numbers for November and October with the yearly average.

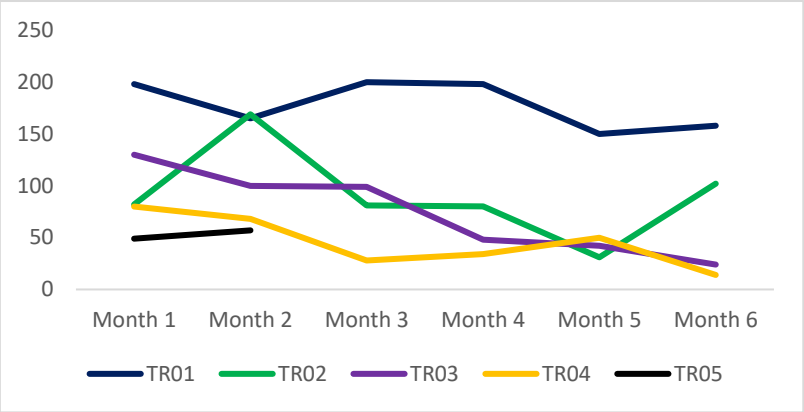
Table 2 – TR01's download increase by year – Average increase in downloads for October and November in comparison with average yearly downloads (without October and November)

Year	English	Portuguese
2019	12.3%	26.5%
2020	0.2%	28.3%
2021	125.9%	-5.6%
2022	6.2%	57.0%

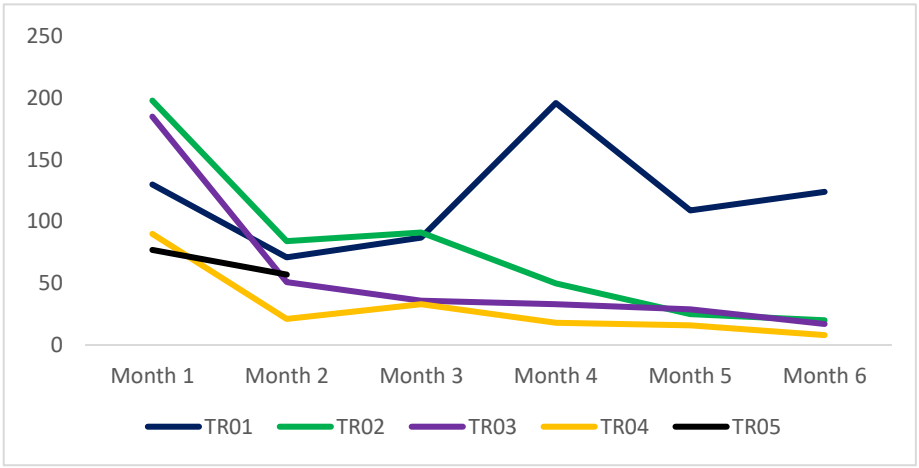
Another yearly observation is that the peak in downloads generally occurs prior to the peak of Google searches for “Mariana dam Disaster”, a proxy indicator for public interest using metrics from Google Trends. Data shows that the public normally googles more Mariana in the first and second week of November, on the disaster’s anniversary, while the RDP’s documents are most downloaded in October. One of the reasons that might explain this monthly variation is that specific groups, such as journalists, are looking for particular information ahead of the disaster’s anniversary to prepare their articles. This variance also implies that there is a year-round baseline audience for RDP’s publication, despite the natural monthly variations that occur because of observable events. Analysis of Google Trend’s data pinpointed that public interest in Mariana peaked in November 2015, the month of the disaster, and in January 2019, after the disaster of Brumadinho. Since November 2020, when Google searches had a minor peak around its fifth anniversary, interest in Mariana began to wane, affecting the number of Thematic Report’s downloads. In 2022, TR02, TR03, and TR04 reached a yearly average of fewer than 20 downloads per month for their English and Portuguese versions.

However, interest in the RDP publications might vary according to many factors, such as communication and institutional strategies, timing, relevance, interest in the theme or even RF's interest in the publication. Graphs 6 and 7 compare download metrics during the first six months after publication of the Thematic Reports and show that peak downloads generally occurred during the first two months for all reports except for the Portuguese version of TR01.

Graph 6 – Comparison of Thematic Report downloads during its first semester – English



Graph 7 – Comparison of Thematic Report downloads during its first semester – Portuguese



III. RF's feedback

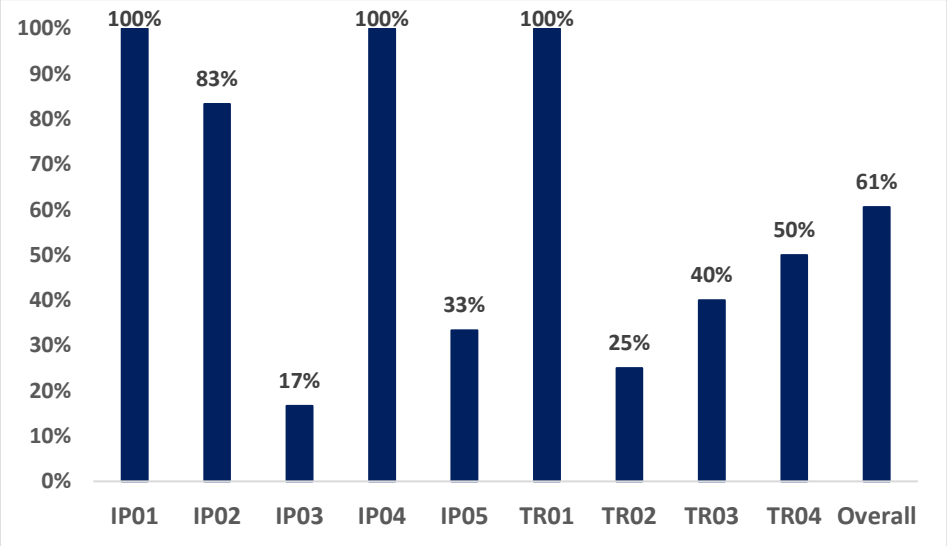
Since the first Thematic Report, IUCN and the RF established a feedback system in which the RF explained how each RDP's recommendations would be implemented. To promote comparisons between various documents, a weighted score called "Acceptance Rate" was assigned for each category (Table 3).

Table 3– Renova's Feedback Categories

Category A1 (1 point)	The recommendation reinforces the current practices of Renova Foundation that will be continued, supported by the recommendation.
Category A2 (1 point)	The recommendation addresses a gap, and Renova Foundation will work to implement what is under its competence.
Category B (0.5 points)	Renova Foundation partially agrees with the recommendation. In consequence, only some aspects of it will be implemented;
Category C (0 points)	This recommendation will not be implemented by Renova Foundation.

Thanks to this methodology, it was possible to observe that acceptance rates varied deeply between the different products issued by the RDP. Graph 8 shows that the first Thematic Report 1 and Issues Papers 1, 2, and 4 had a much higher acceptance rate than average. On the other hand, IP03 had the lowest score mark for all papers (17%), as the RF responded that it would partially adopt only one recommendation and not act upon the other two.

Graph 8 – Renova's Acceptance Rate per Rio Doce RDP's document

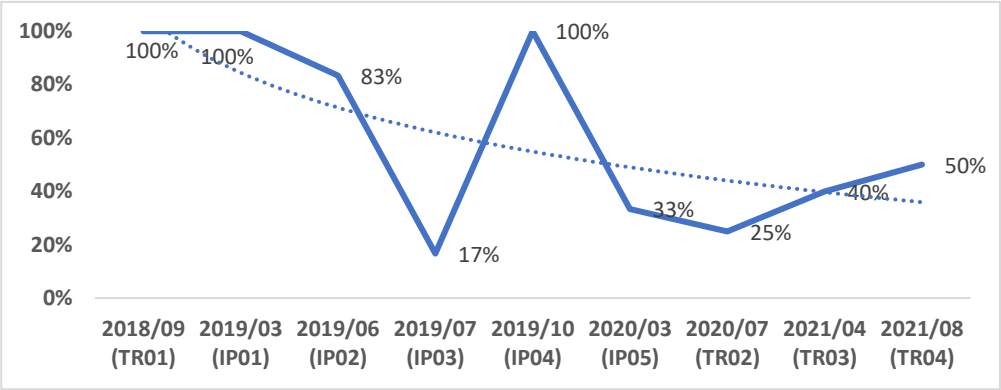


Albeit graph 8 allows cross-document comparisons, it does not provide insight into why documents' acceptance rates by RF varied so much. For that, this section of the report will analyse RF's feedback through two different lenses: chronological and thematic. These analyses are complemented by qualitative and quantitative findings from the end-of-project evaluation, whose extensive uses of interviews provide insights into the relationship between RF and the RDP and surveys conducted by the MEL officer throughout 2022.

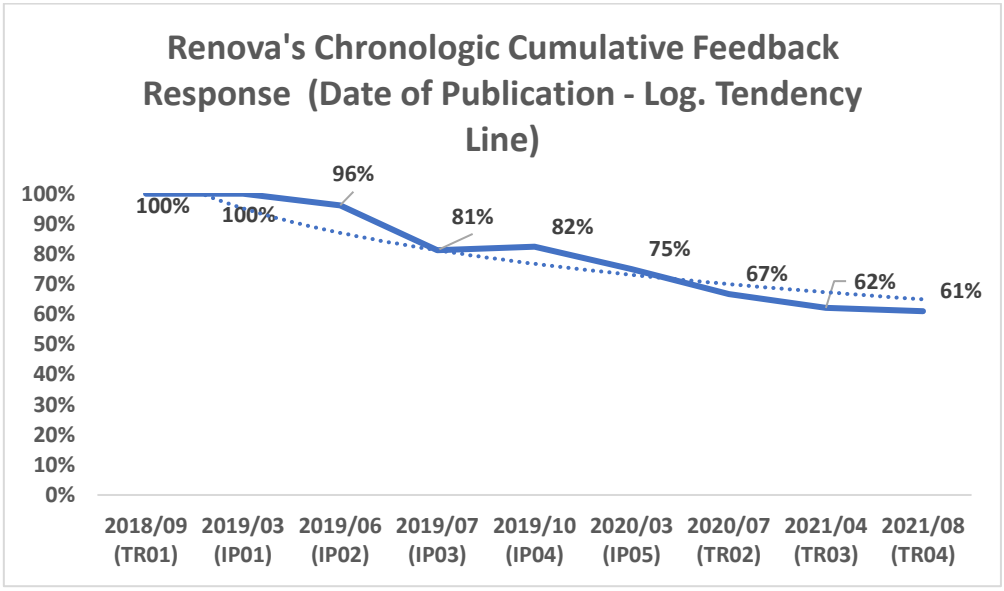
a. Chronological

A chronological analysis allows a deeper insight into the RDP's and RF's relationship. Graphs 9 and 10 illustrate RF's feedback throughout the RDP's lifespan. The graphs show a clear tendency of a diminishing acceptance of the RDP's work by RF from its first thematic report in November 2019 until its second-to-last document, TR04, in August 2021. Acceptance rate dropped from an average high of 96% for the recommendations issued in TR01, IP01, and IP02 to only 35% for those provided in TR02, TR03 and TR04.

Graph 9 – Renova's Acceptance Rate per document in Chronological Order (with Logarithmic Tendency Line)



Graph 10 – Renova's Cumulative Acceptance Rate per document in Chronological Order (with Logarithmic Tendency Line)



One possible explanation for this trend is that the institutional changes within RF affected its level of interest in different topics over time. Many staff members and interviewees

mentioned that RF's programs became increasingly subject to judicial action, focusing solely on the TTAC, with few institutional activities beyond the binding document.

One example illustrating the hypothesis that RF's attitude towards specific topics changed over time is the acceptance of climate-change-related recommendations. During the end-of-project evaluation, RDP members pointed out that RF was not interested in the thematic report focusing on climate change, as the RF's perception was that the theme was not highly relevant to the reparation process. This was confirmed by the fact that three out of the four recommendations related to climate change issued in TR02 (July 2020) received a "C" score from RP, meaning that these recommendations will not be implemented.

This, however, contrasts with how RF responded to TR01R04, which was issued in 2018. At that time, RF feedback suggested that they would take action for their programs directly impacted by climate change.

"Review regional climate change models and propose improvements in mitigation programs to address risks to the achievement of outcomes." (TR01R04)

"The Renova Foundation understands that not all programs will be impacted by climate change. Programs whose objectives and/or results may be impacted are beginning to determine which actions they will take to mitigate the impacts." (Renova's Feedback for TR01)

Another hypothesis for the declining acceptance rate of the RDP's recommendation by RF is the slow pace of TRs production. In a dynamic reparation process context, the time it took the RDP to analyse, write, review, and submit its TRs for peer revision before it got eventually published was perceived as an explicit limitation, with the RF feeling that there was sometimes a time lag between when it most needed the information and when it was made available by the RDP.

At the beginning of 2021, RF contacted the RDP and suggested that it adjusts its recommendation-based *modus operandi* towards a more hands-on approach for creating a joint framework for impact assessment in coastal and marine environments. RDP members agreed to this request and collaborated with RF's technicians and staff members to develop an impact assessment framework over eight workshops at the beginning of 2022. This allowed the RF staff to have early access to the RDP's ideas and recommendations, which meant they could work on it before TR05's actual publication. This resulted in the quick adoption of the framework by RF and the *Fundação Brasileira de Desenvolvimento Sustentável,* a consultancy hired by the RF.

The publication of TR05 in late November was followed by the end of the RDP in December 2022, which means that the RDP did not receive any official feedback from RF on this thematic report. Nevertheless, most RF staff members considered the series of workshops as innovative and helpful for RF's work[1]. When asked if "the workshop

[1]For more detail, see Rio Dolce Panel, Monitoring, Evaluation and Learning Report 2022 [add link].

format was more relevant for their work than the previous RDP recommendations", 94% of respondents claimed this statement to be accurate, suggesting that RF staff well received the change of methodology.

b. Thematic

Early in the project, IUCN decided to group the RDP recommendations into six groups to facilitate communication efforts and help MEL officers keep track of their implementation. Table 4 describes how the 33 recommendations (excluding TR05's) were split between six different groups and their definitions.

The use of the RDP recommendations was monitored with the help of N-Vivo, a software that stores documents (academic papers, articles, meeting minutes, etc.) and allows for organising and analysing large amounts of qualitative data. IUCN MEL officers clustered the recommendations into the six above-mentioned groups, and kept track, with over 1100 documents, of what was happening and what was being implemented in the Rio Doce reparation context. Thanks to this work, it was possible to find several instances of stakeholders that acted upon the recommendation of the panel. The N-Vivo work and its results are presented in-depth in another paper, called "Using secondary data to assess knowledge uptake and influence of the Rio Doce Panel: Findings and key lessons learned from using the N-Vivo software."

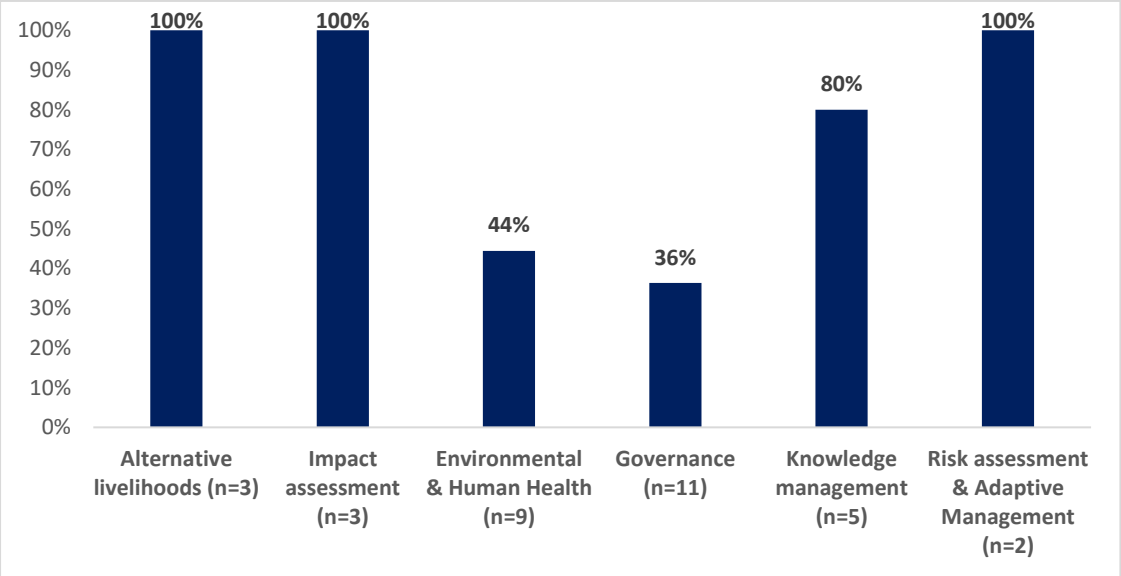
Table 4 – Recommendation Groups and Descriptions

Groups & Number of Recommendations	Description	Recommendations
Environmental and Human Health (9 Recommendations)	Recommendations related to qualifying and improving local ecosystems fall into three different lines of action: i) Continuous effort to monitor the environmental health and the quality of ecosystems; ii) Lake Juparanã-related recommendations; iii) Recommendations focusing on Nature-based solutions;	TR02R03 TR03R02, TR03R05 IP02R02 IP03R01, IP03R02, IP03R03 IP05R01, IP05R03
Governance (11)	An overarching category with recommendations that promote governance models between stakeholders involved in the planning and implementation chains. This involves creating common capacities (e.g., sanitary systems), promoting citizen engagement, creating common frameworks between different stakeholders (e.g., Rio Doce Climate Action Plan), establishing public policies, and planning future actions.	TR01R05 TR02R01, TR02R02, TR02R04 TR03R01, TR03R03, TR03R04 TR04R01, TR04R02, TR04R04 IP02R01

Environmental and Social Impact Assessment (3)	Recommendations that produce a socioenvironmental assessment that promote a diagnosis of a degraded area.	TR01R01, TR01R02 IP04R01
Knowledge Management and Communication (5)	Recommendations related to creating, sharing, and communicating data packages in a systematised manner to relevant stakeholders.	TR01R06, TR01R07 TR0403 IP02R03 IP05R02
Alternative Livelihoods and Socioeconomic Development (3)	Recommendations related to economic development in rural areas, debt availability, and mobilising stakeholders to increase entrepreneurship activity.	IP01R01, IP01R02, IP01R03
Risk Assessment and Adaptative Management (2)	Identify and map potential threats to local resilience.	TR01R03, TR01R04

Based on the groups described above, Graph 11 presents the acceptance rate of each cluster.

Graph 11 – Acceptance Rate by Group



Graph 11 shows that RF accepted well recommendations related to alternative livelihoods, impact assessment, and risk assessment. Most of these recommendations were presented in the RDP's first thematic report and issue paper. Out of eight, six fell under category A1, suggesting that RF understood them as a reinforcement of their current practices rather than as a gap to address. Interviews conducted during the end-of-project evaluation indicated that these early recommendations played a critical role in the creation of the Impact Curatorship, as RF perceived the necessity of assessing the

information available through a more systematised process instead of its previous *ad-hoc modus operandi*.

As a catch-all group that advised a closer collaboration with other stakeholders on various themes, the governance group has the most recommendations and the lowest acceptance by RF. Albeit the RDP's suggestions in this group varied from creating a climate action plan to preparing for a phasing-out transition of RF's responsibilities, RF's feedback responses revolve around one common issue: its institutional position within the reparation efforts.

While the RDP saw in RF a well-placed actor capable of championing and implementing its vision on the ground, RF often mentioned a lack of technical capabilities or not being within its TTAC-defined role to support the changes proposed by the RDP. In response to the RDP's recommendation to build a common governance vision for the source-to-sea framework, RF responded:

> *"[…] the Foundation is not qualified to coordinate the measures described in the recommendation [coordinate the common vision], so the committee itself and the other stakeholders in the governance system must devise strategies to expand and strengthen the operations."*

Similarly, to RDP's recommendation on preparing for a post-RF reparation process, the RF responded that:

> *"The Renova Foundation recognises and values long-term planning for the Rio Doce Basin and, since its activities began, has clearly understood its finite nature as an institution. […] In any case, the Renova Foundation does not participate in the renegotiation process, where the TTAC signatory institutions are negotiating the future of reparation and compensation programmes."*

Recommendations addressing Environmental & Human Health issues also trailed in RF's acceptance. The RF only embraced IP02R02 (including fishermen in a monitoring network) and TR02R03 (adopting Nature-based solutions), while the remaining recommendations fell under B and C categories, including three recommendations from Juparanã. Most of the rejected or only partially accepted recommendations involved expanding existing programs (i.e., PMQQS, introducing NbS into the sanitation system and improving biodiversity monitoring data).

One of the findings of the end-of-project evaluation was that RF became increasingly bound to TTAC after its programs started to be judicialised and reluctant to promote actions beyond its legal obligations. RF's low acceptance rate of recommendations related to Governance and Environmental & Human Health confirms this position as most of them suggest that RF takes a more active coordination role among the stakeholders involved in the restoration process or adds new components to its existing programs.

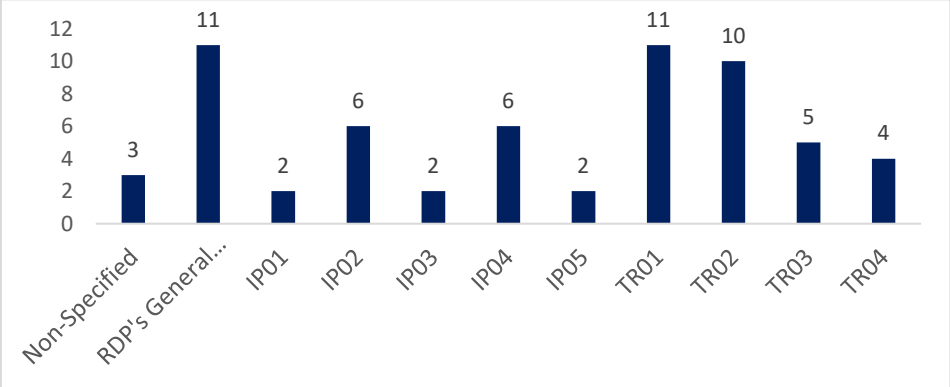
Another finding from the end-of-project evaluation and supported by further interviews and IUCN Secretariat testimonies was that RF's acceptance rate started to drop once RDP started to work on themes that differed from RF preferred ones. Issue Paper 03, focusing on the Juparanã Lake was, for example, seen as contentious, and the RDP experienced some institutional push-back with its publication. A former RF staff member claimed that this Issue Paper marked a negative milestone for the RF and RDP's relationship.

IV. Impact Log

The Impact Log began to be used by the RDP and IUCN secretariat staff members in October 2018 as a tool to capture instances of how the RDP's work influenced other organisations or individuals, such as reparation process stakeholders, civic society, or academia.

Until February 2023, when the last registry was recorded, the Impact Log had 58 entries. Of these 58 entries, 49 directly relate to one of the thematic reports or issue papers developed by the RDP. It is noteworthy to point out that the type of influence captured varied deeply from the use of TR02's Climate Change findings in the Brumadinho reparation context to the creation of an Impact Curatorship within the RF Foundation.

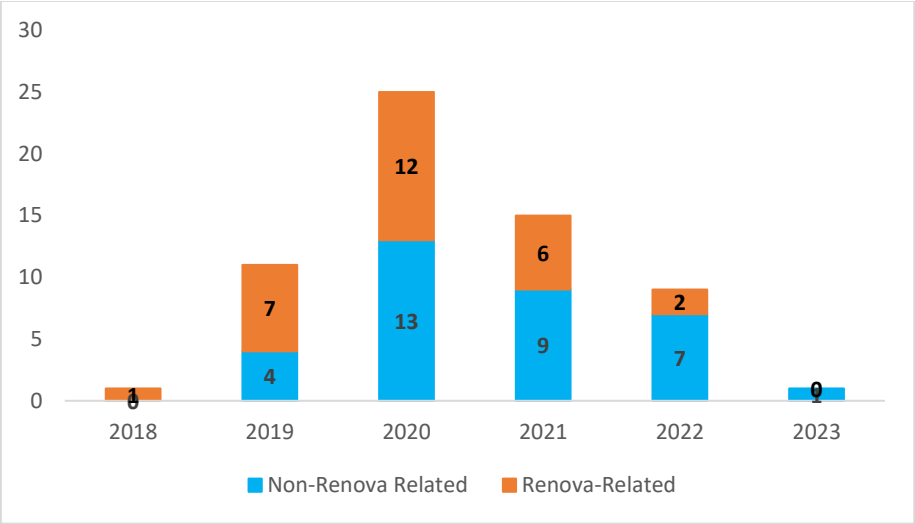
Graph 12 – Quantitative Analysis - Number of Impact Log registries per document



Graph 12 shows the number of instances of influence registered for each document and points out that TR01 and TR02 were the documents with the most entries. TR03 and TR04 had the lowest numbers but were launched in 2021 only, which might explain this difference.

For the Issue Papers, IP02 and IP04 had the highest number of instances of influence recorded, even though IP02 did not have any academic citations.

Graph 13 – Recorded Influence Log Entries Overtime (and Renova-related entries)



Graph 13 shows that both RF and other stakeholders were influenced by the RDP, with a peak of instances recorded in 2020. A closer look at the instances registered allows to understand better the kind of influence the RDP had on RF. This includes, but is not limited to:

Impact Curatorship – TR01 showed that RF needed to produce a more systematic assessment of all the information made by academia and technical organisations in the reparation context. This led to the creation of the Impact Curatorship, a department within the RF that focuses on transversal subjects and tries to promote integration within the many reparation programs.

Impact Assessment – IP04's and TR05's take on impact assessment was necessary for the RF's construction of an assessment framework on marine and coastal biodiversity. The links that the RDP established with RF staff members and with Fundação Brasileira de Desenvolvimento Sustentável (FBDS), a consultancy hired by RF for a similar role, made the framework to be a collaborative work and more applicable within the reparation context.

Human and Environmental Health – The One Health approach proposed by the RDP in IP05 led to RF embracing a methodology called Integrated Management for Health and Environment (GAISMA). This adoption of this approach was met with controversy by the victims, which preferred an analysis focused on human health, and the judicialisation made RF drop the methodology.

Fishing - From early 2020, the organisation of workshops by RF aimed at providing feedback and communicating the results of the overall assessment of freshwater biodiversity and fish toxicity to affected communities and government authorities. An RF member also mentions that IP02 reinforced the Foundation's practices under Program 14, which focuses on affected people's physical and mental health.

Graph 14 also illustrates the impact that TR02, TR03, and TR04 had on other stakeholders than RF. A closer look at the instances recorded in the log showed that

TR02 primarily influenced representatives from Vale and members of the Minas Gerais public spheres. Vale officials used the document as a source for Brumadinho's disaster reparation efforts, while the Minas Gerais' state government officials used the document to create climate action plans.

The source-to-sea Thematic Report (TR03) had a strong impact on the Minas Gerais state government's technical members. Government executives, for example, reported using the document as a source for different approaches for the watershed amidst the renegotiation context. They also said using TR04's insights on the reparation process governance. TR03's innovative transpositions of a concept unfamiliar to the Brazilian context also resonated with universities. Other examples of how the work of the RDP influenced different audiences include:

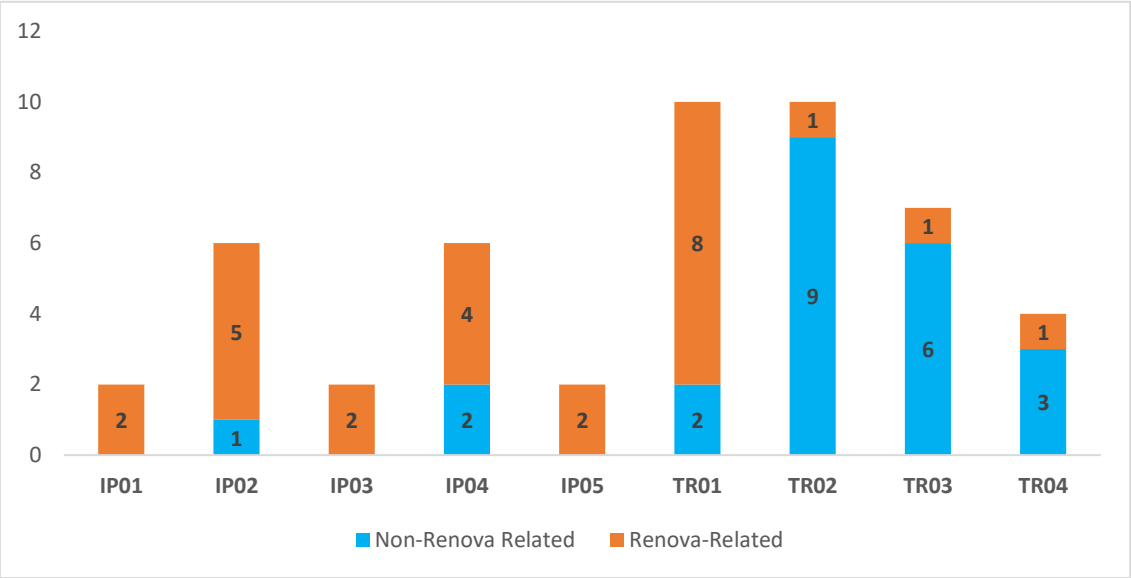
Fishing - The use of IP02 by the public prosecutor in July 2019 to justify the fishing ban. As of December 2022, fishing in the Rio Doce basin remains illegal.

Climate Change – The World Resource Institute (WRI) used IUCN's Restoration Opportunities Assessment Methodology (ROAM) and TR02 to promote a diagnostic of the basin and argue that the Rio Doce reparation context need to adopt more policies and increase investments capable of generation institutional and social resilience for adaptation to climate change.

The second Thematic Report also coincided with several watershed committees adopting climate change as a major threat to the upcoming sustainability. Examples include the Integrated Plan for Water Resources (PIRH) of the Rio Doce watershed and the Manhuaçu sub-basin.

Biodiversity - The invitation sent by the CIF Biodiversity Technical Chamber to the RDP members in December 2020 to participate in the revision of the biodiversity-related TTAC programs.

Graph 14 – Recorded Influence Log Entries by Documents



When looking at the specific influence that thematic report and issue paper had on RF, we can observe that out of the 28 influence entries recorded for RF, 55% relate to IPs, and 45% to TR, with 32% for TR01 only. This difference might be explained by the fact that Issue Papers were shorter, took less time to prepare and had more direct recommendations, which were not subject to peer review for publication. A closer look into Issue Paper's influence log entries also infers that RF took more active measures to implement IP's recommendations than those from Thematic Reports.

Overall, the Impact Log analysis provides a good panorama of the influence of RDP products on its target audiences over time. Instances of influence captured in the log suggest that IPs had a more significant impact on RF than TRs. Aside from the strained relationship and institutional changes within the RF, one possible explanation is the difference in production timing between TRs and IPs (IPs were produced before most of TR) and IP's recommendations were perceived as more straightforward to implement than TR's. On the other hand, instances of influences showed that RDP increased its effect on other stakeholders, such as government officials, universities, and civic society, with the publication of Thematic Reports. According to the end-of-project evaluation, the influence on these stakeholders could have even been stronger with additional institutional support from IUCN Brazil's office.

Part II – Conclusion

This report analysed data collected against four different indicators used throughout the RDP's lifespan to answer the following questions: "**What impact had the RDP on how its audience undertakes its core activities, and how lasting are these changes likely to be?"** Although the data from Citation Metrics, Download Numbers, RF's Acceptance Rate, and impact log did not converge into a single explanation, they helped portray a panorama of the RDP's impact on the reparation efforts. Data analysed for this report tends to show that the RDP had a high impact on RF's action until 2020. The high-level acceptance of RDP's early reports and recommendations, and some of the actions taken by RF, such as the creation of the Impact Curatorship, are signs of a good institutional relationship and of the RDP's influence.

It is most likely that some of the decisions taken by RF or other actors influenced by the work of the RDP, such as CBH's decision to update the Integrated Plan for Water Resources, will have long-lasting effects on the restoration of the Rio Doce basin. However, the impact of these decisions and the degree of their implementation should continue to be monitored and documented over time.

Although the exact milestone is uncertain, all the data analysed suggest that the RDP's influence on RF started to decrease in 2021, while its influence on other actors increased almost similarly. Three factors might explain this trend:

Timing – This hypothesis links the dwindling RDP's impact rates on RF to timing issues. Thematic Reports take longer from their inception until their publication than Issue Papers. This hypothesis argues that recommendations from Issue Papers were easily implementable for RF since the Issue Papers were shorter, took less time to be published and were more likely to present updated insights than the Thematic Reports.

In comparison, staff members interviewed during the end-of-project evaluation process suggested that the time it took from the Thematic Report inception phase until its publication affected its relevance as it created a time lag between when RF most needed the information and when it was available. RF and IUCN's change of *modus operandi* preceding TR05 and a follow-up interview with an RF staff member after TR05's publication also tend to corroborate this hypothesis.

Data from download metrics and academic citations indicate that TR01's download numbers were more affected by seasonality than the other reports, which infers its use by journalists in the month preceding the disaster anniversary. Similarly, Google analytic metrics pointed out that public interest in the Mariana disaster has been dwindling since November 2020 and that this trend has also affected the RDP's document downloads.

Citation metrics also show that TR01 had a more substantial outreach, as it is often mentioned by other papers to describe the disaster and the impact of the tailings. Another observable trend is the decrease of mentions made by consultancies over time and the increase of citations in papers linked with universities outside Minas Gerais and Espírito Santo, the more affected area. The fact that TR01 reached its citation peak two years after its launch and that 2022 was the peak year for the RDP's citation might also suggest

an increase in citations in the coming years when more papers using TR03 and TR04 as a source will be published. Similarly, increased interest in a particular theme, such as climate change, could lead to additional citations.

Overall, download number and citation metrics show two opposite trends. As time passes, public interest in the Mariana disaster wanes, and the RDP's download metrics are affected, leading to a decrease in RDP's outreach. This downward trend is, however, restricted to the general audience as the increasing number of citations in scientific papers suggests a broader use of the RDP's work by the academic world.

Institutional Change and Judicialization – 2019 was a year of institutional turmoil for RF's leadership. Based on a series of interviews, the end of project evaluation pointed out that RF became increasingly TTAC-oriented over the years because of the judicialisation of the reparation programs and had less programmatic autonomy to guide itself outside the binding legal document. This period of institutional turmoil culminated with the first president stepping down from his leadership position in November 2019 and being replaced by the current president of the RF Foundation. The COVID-19 pandemic soon followed, making contact between RF and IUCN more complex and possibly affecting staff turnaround in RF.

Themes – The last explanation is that themes chosen by the RDP started to differ from the ones preferred by RF. After the publication of IP03, which focused on the contentious issue of the Juparanã Lake, all the reports and papers (apart from Issue Paper 4) produced by the RDP had a low acceptance rate of their recommendations.

An interview with a former RF staff member suggested that IP03 was initially not well received or understood by the Foundation. Similarly, the RF was not keen to receive an entire thematic report focusing on climate change, which the Foundation believed would not affect all of its programs. While there was no evidence of the same issues occurring with TR03 and TR04, its rather innovative content that was thought outside the TTAC might have been perceived as contentious by RF.