Making disaster displacement visible in Brazil

An analysis of the official national disaster information system

Erika Pires Ramos, Fernanda de Salles Cavedon-Capdeville, Luiza de Moura Pallone, Andrea Zamur
(RESAMA, South American Network for Environmental Migrations)

INTRODUCTION

Latin America and the Caribbean (LAC) is the second most disaster-prone region in the world and Brazil ranks high on the list of populations most affected by recurring climatic shocks, particularly droughts and floods[1]. The intense rainfall and landslides that devastated the *Serrana* region of Rio de Janeiro in January 2011 marked the beginning of substantial changes in Brazil's approach to disaster management, including new norms, policies and structures to guide and coordinate the civil defence at national, state and local levels. In terms of disaster data, the creation of an Integrated Disaster Information System (S2ID) represented a major step towards coordination and transparency, and improved accessibility of national disaster-related data. However, gaps connected to categorisation, terminology and methodology continue to challenge the achievement of reliable information regarding the impact of disasters on communities and, especifically, on population displacement.

Inspired by the challenge of obtaining figures of disaster displacement in Brazil, the South American Network for Environmental Migrations (RESAMA) conducted an assessment of the available disaster data related to the year of 2018, which served as a starting point to examine not only the Integrated Disaster Information System (S2ID), but also the existing norms and policies that guide data collection.

The study sheds light on the lack of visibility of people displaced by disasters, as the current Brazilian legal framework and governance related to disasters do not adopt the concept of displacement. Consequently, the national data collection system in place does not include a category that fully reflects the particularities of displacement situations, hindering the identification and monitoring of disaster displacement cases in the country. Other related gaps identified were the absence of disaggregated data, challenges associated with data collection in the context of slow-onset events, and the lack of sufficient post-disaster monitoring.

Hence, people displaced by disasters in Brazil remain invisible and underestimated within disaster risk reduction policies and laws. This paper presents a summary of the findings of RESAMA's study, in order to show how improved data collection and sharing of information related to disaster displacement would allow Brazil to overcome gaps that currently jeopardize the visibility of displaced persons, and to develop effective response strategies. Better mapping, understanding and management of durable solutions to disaster-induced internal displacement depend heavily on enhanced data collection and its availability to foster data-informed decision making.

[1] OCHA (2020). *Natural Disasters in Latin America and the Caribbean (2000-2019)*. Available at <https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/20191203-ocha-desastres_naturales.pdf>

METHODOLOGY

This research was based on the analysis of the "Informed Damage" Report of the Brazilian Integrated Disaster Information System (S2ID) between 01 January and 31 December 2018. This report compiles available quantitative data on predetermined categories of damage for all disaster events officially reported in Brazil during the specified period. It includes events registered as "natural disasters" and "technological disasters". However, only the ones related to "natural disasters" were analysed in the scope of this study. The dataset is publicly available and was extracted from the official information platform of the former Ministry of Integration (currently Ministry of Regional Development), under the National Secretariat of Civil Defense[2].

In order to understand the procedures and guidelines that shape this information system, various official sources have been consulted, such as the National Policy on Protection and Civil Defense and the Brazilian Classification and Codification of Disasters and Normative Instructions, which determine the reporting procedures of data that feed the Integrated Disaster Information System (S2ID).

STATE OF THE ART - NORMATIVE AND STRUCTURAL CONTEXT

Since 2012, all activities related to prevention, mitigation, preparation, response and recovery from disasters in Brazil are guided by the National Policy on Protection and Civil Defense (PNPDEC[3]), which was established by Federal Law no. 12,608/2012. This policy presents a systemic approach to disaster risk management, in which all actions should be interconnected, in accordance with the guidelines from the Sendai Framework. This policy should be followed by all members of the National System on Protection and Civil Defense (SINPDEC)[4] and integrated into sectoral policies, such as land-use planning, urban development, health, environment, climate change, hydrological resources management, geology, infrastructure, education, science and technology.

Normative Instruction no. 02 of 20 December 2016[5], contains the criteria and procedures to be followed by states and municipalities in order to declare a situation of emergency or a state of public calamity. This depends on the intensity of the disaster, which can be categorized in three levels:

[2]Sistema Integrado de Informações sobre Desastres. Available at: <https://s2id.mi.gov.br>

[3]Lei n. 12.608, de 10 de abril de 2012. Available at: <http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12608. htm>

[4]Brasil. Ministério da Integração Nacional. Secretaria Nacional de Proteção e Defesa Civil. Departamento de Prevenção e Preparação. Módulo de formação: noções básicas em proteção e defesa civil e em gestão de riscos: livro base / Ministério da Integração Nacional, Secretaria Nacional de Proteção e Defesa Civil, Departamento de Minimização de Desastres. - Brasília: Ministério da Integração Nacional, 2017. <http://integracao.gov.br/documents/3958478/0/I+-+Gestao+de+Risco+-+Livro+Base.pdf/7f00f4ac- 14ba-4813-b3d3-561a703d62a7>

[5]Instrução Normativa n. 02 de 20 de dezembro de 2016. <http://www.mi.gov.br/documents/3958478/0/Instrução+Normativa+N+02+-+VERSAO+PARA+PUBLICAÇÃO-21.12.16.pdf/dfee339a-4aa9-4d39-8220-a9a9c3434779> replaced previous Normative Instruction no. 01 of 24 August 2012.

Level 1: Disaster of low intensity	Those where there are only considerable human damage and the situation of normality can be reestablished with the resources mobilized on the local level or complemented with state and federal resources.	**Situation of Emergency**
Level 2: Disaster of medium intensity	Those where loss and damage are bearable and surmountable by local governments, and the situation of normality can be reestablished with resources mobilized on the local level or complemented with state and federal resources. They are characterized by the occurrence of at least two types of damages, one of them being, mandatorily, human damage that entails public or private economic losses that affect the public administration's capacity to respond and manage the crisis.	
Level 3: Disaster of high intensity	Those where loss and damage are not bearable or surmountable by local governments and the reestablishment of the situation of normality depends on the mobilization and coordinated action of all the three spheres of the National System of Protection and Civil Defense (SINPDEC) and, in some cases, of international aid. They are characterized by the simultaneous occurrence of deaths, population isolation, interruption of essential services, interdiction or destruction of housing units, damage or destruction of public facilities providing essential services and public infrastructure works.	**State of Public Calamity**

Figure 1: Definition of disaster intensity levels for the purpose of determining Situation of Emergency and State of Public Calamity. All translations by authors.

At present, the official national source of information related to disasters in Brazil is the Integrated Disaster Information System (S2ID). The S2ID compiles official data and information about disasters reported by local authorities for the recognition of "Situations of Emergency" or "State of Public Calamity", which is part of the process of transfer of federal resources to states or municipalities affected by a disaster. The S2ID aims to improve and give transparency to disaster risk management in Brazil through the computerization of processes and availability of systematized information. It is important to highlight that the data collected refer only to the moment of the emergency without following the evolution of this data.

This S2ID was developed in a partnership between the National Secretary of Civil Defense (SEDEC) and the University Centre for Studies and Research on Disasters from the Federal University of Santa Catarina (CEPED/UFSC). The use of the system became mandatory through Ordinance GM/MI n. 526/2012.

According to the above-mentioned 2016 Normative Instruction[6], in the occurrence of a disaster, the municipal or state authority must gather all the initial information about the disaster in the Disaster Information Form (FIDE)[7], which is then sent to the federal government for recognition via the S2ID. This form is divided into 9 major sections: 1- Identification; 2- Typification (according to the Brazilian Classification and Codification of Disasters - COBRADE); 3- Date of the occurrence; 4- Affected area/ Type of occupation; 5- Causes and effects of the disaster (description of the event and its characteristics); 6- Human, material or environmental damage; 7- Public and private economic losses; 8- Informing institution; 9- Informed institutions.

[6]Instrução Normativa n. 02 de 20 dezembro de 2016. <http://www.mi.gov.br/documents/3958478/0/Instrução+Normativa+N+02+-+VERSAO+PARA+PUBLICAÇÃO-21.12.16.pdf/dfee339a-4aa9-4d39-8220-a9a9c3434779>

[7]Sistema Nacional de Proteção e Defesa Civil (SINPDEC). Formulário de Informações do Desastre (FIDE). Available at: <http://www.mi.gov.br/documents/3958478/0/Anexo+I+-FIDE.pdf/0c83461a-025e-4517-8513-f15c061b0ccf>

The concepts and terminology officially adopted by the Brazilian government are a very important point of concern, as they determine which categories will gain visibility and become measurable through the post-disaster data collection process. The current legal framework and governance related to disasters do not adopt the concept of "displaced" individuals or "disaster displacement". These situations fall within the general category of "human damage". Section 6.1 - "Human damage" of the Disaster Information Form (FIDE), provides seven different categories for the specification of the number of people affected, which will later be reflected in the database of the Integrated Disaster Information System (S2ID):

Translated term	Original term	Definition
Dead	Mortos	deceased people
Injured	Feridos	injured people that may need hospitalization or not
Sick	Enfermos	people that contracted diseases
Dislodged	Desalojados	people whose houses have been damaged or destroyed, but do not necessarily need temporary shelter
Unsheltered	Desabrigados	people whose houses have been damaged or destroyed, or are located in areas of imminent risk of destruction, and that need temporary shelter
Missing	Desaparecido	people that have not been localized or whose location is unknown, in the circumstances of a disaster
Other affected	Outros afetados	people that have been victimized in a way that differs from the ones previously mentioned. In this case, the system requires a description.

Figure 2: Definition of categories under section 6.1 "Human Damage" of the Disaster Information Form (FIDE). All translations by authors.

The categories of "dislodged" and "unsheltered" refer to people whose houses have been impacted by the disasters, requiring them to leave their homes. The Civil Defense Planning Manual clarifies that 'not all people who have been "dislodged" from their homes in disaster circumstances require temporary shelters [...]. It is normal that, in these circumstances, a large number of "dislodged" families stay in the homes of friends and relatives, reducing the demand for temporary shelters. In general, the greater the number of "dislodged" and the lower the number of "unsheltered" people, the less vulnerable is the community'[8]. In the same logic, 'a high number of "unsheltered" people is a preponderant criterion to assess the severity of a disaster and to define the demand for [public shelter] facilities and the human, institutional and material resources needed to assist the affected population'[9].

The concept of disaster displacement, "the situation where people are forced to leave their homes or places of habitual residence as a result of a disaster or in order to avoid the impact of an immediate and foreseeable natural hazard", as adopted by the Platform on Disaster Displacement[10], is not adopted by the

[8]Ministério da Integração Nacional, Secretaria de Defesa Civil (1999). Manual de Planejamento em Defesa Civil. Volume I. Available at: <https://www.mdr.gov.br/protecao-e-defesa-civil/publicacoes>

[9]Ibid.

[10]Platform on Disaster Displacement (PDD). Key Definitions. <https://disasterdisplacement.org/the-platform/key- definitions>

current Brazilian legal framework and governance related to disasters. Consequently, the national data collection system in place does not include a category that fully reflects the particularities of displacement situations, hindering the identification and monitoring of disaster displacement cases in the country.

Although these two categories may, in some cases, overlap with situations of displacement, their definitions are not equivalent to the full extent and complexity of a situation of disaster displacement. They are directly linked to the affected person's housing, either because the house was affected or because there was a need to leave the house permanently or temporarily due to evacuation, destruction or serious damage. It indicates the emergency character of these concepts, which focus on the loss or damage related to housing and the need for emergency shelter in the aftermath of the disaster. They do not consider the whole displacement cycle and its implications in the long term. Furthermore, if someone is displaced as a consequence of a disaster, but housing is not affected (in a drought or dry season event, for example), they are generally not accounted for as "dislodged" or "unsheltered" and, therefore, would not be reported as a displaced person. This issue is evidenced by the fact that most affected people in contexts of droughts and prolonged droughts are reported under 'other affected', which suggests a potential challenge in classifying the impact of slow-onset disasters in the categories of human damage provided by the S2ID. In conclusion, these categories and their concepts are not adapted to the identification and information of people displaced by disasters, having consequences in the data quality and in the possibility of monitoring the evolution of disaster displacement in the country.

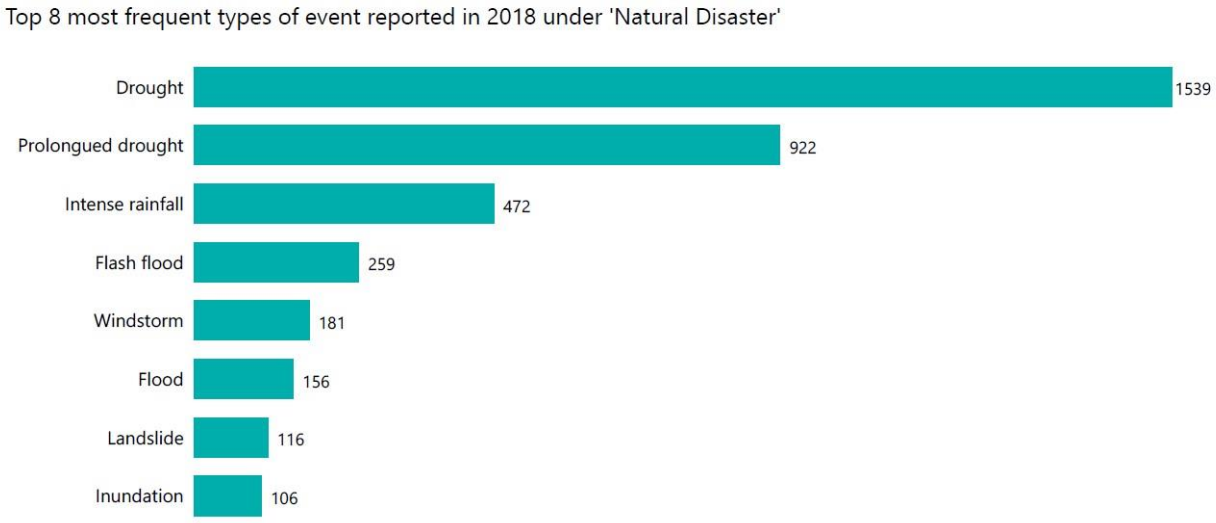
It is also important to highlight that, before the implementation of the Disaster Information Form (FIDE) in 2012, the reporting of information related to disasters was done through 3 different documents, not necessarily interdependent: the Preliminary Disaster Notification (NOPRED), the Damage Assessment Form (AVADAN)[11] and a municipality's Decree. The "Human Damage" section of NOPRED and AVADAN included a breakdown by age group and, apart from the 7 categories maintained by its successor, it also included a category dedicated to displaced persons (*Deslocados*), indicating that the distinction between "Dislodged" (*Desalojados*), "Unsheltered" (*Desabrigados*) and "Displaced" (*Deslocados*) have previously been acknowledged and addressed through categorization in Brazil.[12] With the creation of FIDE, however, the "Displaced" category was removed, as well as the age groups for data disaggregation.

BRIEF OVERVIEW OF 2018

In the period between 01 January and 31 December 2018, a total of 4,116 events were officially reported under the category of 'natural disaster' in the Integrated Disaster Information System (S2ID). A large majority of the events reported, precisely 2,461 (59.7%), were droughts and prolonged droughts.

[11] Formulário de Avaliação de Danos (AVADAN). Available at: <http://www.petropolis.rj.gov.br/dfc/index.php/avaliacao-de-danos.html>

[12] In the Brazilian Atlas of Natural Disasters that compiled and analysed disaster data and information between 1991 and 2012 based on information from NOPRED and AVADAN, there are data on displaced persons related to forest fires. UFSC/CEPED (2013). Atlas Brasileiro de Desastres Naturais: 1991 a 2012. 2. ed. Available at: <https://s2id.mi.gov.br/paginas/atlas/>



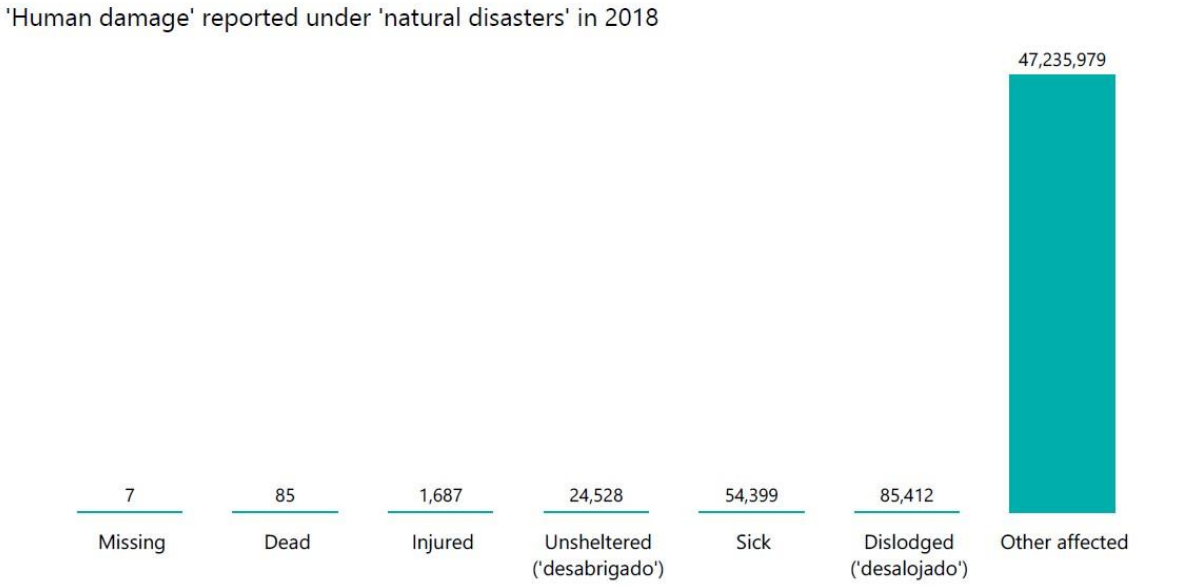
Data source: Sistema Integrado de Informacoes sobre Desastres (S2ID). *Relatorio Danos Informados* relating to the period from 01.01.2018 to 31.12.2018. Latest download on 14 February 2020. Data visualization developed by the authors.

Figure 3: Top 8 most frequent types of event reported in 2018 under "Natural Disaster". All translations by authors.

In terms of "Human Damage", the categories of 'unsheltered' and 'dislodged' accounted for 24,528 and 85,412 people respectively, while the number of people reported as "Other affected" reached 47,235,979, as shown in the chart below.

In 2,553 events (62%), the figures for "Human Damage" were only reported under "Other affected", leaving all the other 6 categories blank. Out of these, 2,213 were events of droughts and prolonged droughts, which can be an indicator of the failure of the available categories in reflecting the types of human impact caused by slow-onset events.

Another interesting pattern observed was that in 648 events, the number reported under "Other affected" equalled the total population of the municipality affected. This indicates a potential lack of resources and capacity of local authorities to perform a detailed assessment of human damage in the post-disaster context.



Data source: Sistema Integrado de Informacoes sobre Desastres (S2ID). *Relatorio Danos Informados* relating to the period from 01.01.2018 to 31.12.2018. Latest download on 14 February 2020. Data visualization developed by the authors.

Figure 4: "Human Damage" reported under "natural disasters" in 2018. All translations by authors.

GAPS AND OPPORTUNITIES FOR IMPROVEMENT

A more detailed consultation of the Integrated Disaster Information System (S2ID) allowed us to identify certain gaps and weaknesses that must be mentioned in order to demonstrate the limits and possible flaws in the database.

Official categories and concepts adopted by the National System on Protection and Civil Defense

- Absence of categories that fully reflect situations of displacement in the context of disasters in the disaster risk reduction legal framework, official documents and glossary, particularly in the framework of human damage reporting in the Disaster Information Form (FIDE).
- The two official existing categories that are closest in meaning to a situation of displacement focus on the loss and damage related to housing and the need for emergency shelter in the aftermath of the disaster, without considering the complexity and particularities of the displacement process that may be initiated with the disaster.
- The presence of a category of "Displaced" (*Deslocados*) in the former Preliminary Disaster Notification (NOPRED) and Damage Assessment Form (AVADAN), indicates that Brazil has previously acknowledged the nuances in definition between "Displaced", "Dislodged" and "Unsheltered". The removal of the "Displaced" category from the current Disaster Information Form (FIDE) in 2012 has contributed to the challenge of identifying, measuring and understanding situations of disaster displacement. This is understood as a setback in terms of ensuring the protection of people displaced, particularly in the context of slow-onset events.
- In general, the definitions of official categories are not very clear and result in difficulties in finding an exact translation and establishing a parameter of comparison with other categorizations, concepts and databases outside the Brazilian context.

Data collection procedure

- As previously discussed, the only official channel to report information about the disaster events and their damages, as well as to obtain the transfer of federal funds for recovery is the Integrated Disaster Information System (S2ID) The information is collected and reported by local civil defense authorities (of the affected municipality or state, in case the event affected several municipalities of the same state) through the Disaster Information Form (FIDE). Although the reporting procedure is standardised across the country, our analysis indicates that there are significant differences in the quality and detail of the information reported.
- There may be a disparity between the number of events reported in the S2ID and the real number of individual events. For instance, if an event impacts more than one municipality, it is highly possible that local authorities from different municipalities report the same event in the S2ID, as it is the official channel for obtaining federal funds. Consequently, the system includes all reports of disaster events reported by local authorities, remaining unclear how many of those reports refer to the same individual event.
- The lack of standardised guidelines and protocols for collecting disaster data and of some form of centralised verification and quality control of the data collected compromises the reliability of available data in Brazil.
- As information on disasters is collected and reported at the time of its occurrence (emergency), there is no monitoring of the evolution of the situation and a specific system and/or procedure for updating the reported data. Consequently, there is no follow-up on the situation of people initially reported as "dislodged" and "unsheltered", such as how many were able to return to their homes in the short-term and how many remain displaced. It is also impossible to identify issues related to the distance of displacement, such as if they remain in the same municipality, or whether the impacts of the event led to a displacement to another municipality or state. The lack of monitoring of the evolution of disaster information also prevents the identification of cases in which persons

considered missing at the time of the emergency were in fact displaced to other localities or if persons initially considered as "other affected" eventually were displaced in a second moment as a consequence of the disaster.

- Data on human damage is not disaggregated, which makes it impossible to carry out a more detailed analysis of vulnerable groups (persons with disabilities, migrants, indigenous peoples and other traditional populations, for example), age group, gender and socioeconomic situation of displaced persons. It is important to point out that the previous disaster information form (AVADAN and NOPRED, replaced by FIDE) had some disaggregated data, such as age range. An attempt to facilitate and simplify the disaster information procedure ended up limiting detailed data collection.

Official Disaster Information Database

- In the publicly available platform of the Integrated Disaster Information System (S2ID), the Informed Damage report containing quantitative data about events reported nationwide from 2013 until present are available for download. On the other hand, the section that allows for visualization of documents containing qualitative data related to each one of the events reported by local authorities is outdated. The available reports with qualitative data date back to events that occurred until February 2017. As a result, the documents and detailed descriptions about each event that occurred in 2018 were not available at the time of this research.
- Other gaps in the system are a consequence of the fragilities and problems identified in the categories and concepts adopted and in the data collection procedure, such as: incomplete or non-informed data, lack of more detailed and specific information on disaster displacement, lack of information about dislodged and unsheltered related to drought and prolonged drought, lack of disaggregated data and information about non-tangible loss and damage, the possibility of overestimation in the number of events, the lack of procedures for monitoring and evaluating the evolution of data on events, as the information reported relates only during the emergency.

Regarding the identified gaps, RESAMA made contributions with respect to the draft regulatory decree of the Law 12,608/2012 (*National Policy on Civil Defense*)[13] submitted for public consultation last year. Besides the adoption of the terms "displaced" and "displacement", RESAMA reinforced the need for better data collection protocols, providing measures to prevent and better respond to disaster displacement.

The draft text submitted for public consultation sets out guidelines to the development of a *National Plan for Protection and Civil Defense*, proposing indicators for measuring its implementation. In this regard, RESAMA proposed the inclusion of disaggregated data in the indicators related to affected people, including the number of displaced people and, within a prevention perspective, the number of people living in risk areas[14], considered as exposed to the risk of displacement. Other alternatives to integrate disaster displacement as an indicator were presented, such as the incorporation of displacement statistics in disaster risk assessments.

To overcome identified gaps and fragilities associated with data collection and sharing, governments, data

[13] RESAMA contributions were sent during the public consultation launched in June 2019 by National Secretary of Protection and Civil Defense of the Regional Development Ministry (SEDEC/MDR) according the official guidelines (by email to the Articulation and Management Department - DAG/SEDEC/MDR): <https://cidades.gov.br/component/content/article/293-secretaria-nacional-de-protecao-e-defesa-civil/11856-consulta-publica>. The result of this public consultation with the analysis of the received contributions and what will be endorsed into the final version of the Decree has not been released so far.
These contributions were also presented to researchers of the CEMADEN - National Center of Monitoring and Alerts of Natural Disasters: <https://www.cemaden.gov.br/inclusao-do-tema-deslocamentos-humanos-nos-dados-sobre-desastres-foi-discutido-no-cemaden/>.

[14] CEMADEN and IBGE launched in 2018 a database on population in areas at risk of floods, landslides and flash floods in Brazil combining the data of population census and monitored areas by CEMADEN. More information available at: <https://www.cemaden.gov.br/cemaden-e-ibge-lancam-base-de-dados-sobre-populacao-exposta-em-areas-de-risco-de-desastres/>

collectors and researchers must contribute not only to the harmonization of definitions, but also to the development of comprehensive and detailed methodologies and systems to enhance disaster data collection.

It is important to underline that among the targets and initiatives of the Risk Management Programme (2040) of the Brazilian Multi-Year Plan 2016-2019[15], there is a provision concerning the improvement of the Disaster Information and Monitoring System, the improvement of the criteria to declare a situation of emergency and state of public calamity, and joint action protocols for all federal entities.

FINAL CONSIDERATIONS

To allow a better understanding of disaster displacement in Brazil and provide accurate up-to-date and disaggregated data on the topic, the following recommendations are to be highlighted:

- The revision of legal frameworks concerning disasters to include provisions on displacement in existing laws and policies through appropriate terms and concepts, which are expected to be aligned with international guidelines.
- The reform of the methodology and structure of the data collection and dissemination system, considering especially the particularities related to slow onset events.
- The improvement of the data collection forms in order to incorporate categories that reflect appropriately situations of displacement.
- The establishment of protocols to coordinate and improve data collection and the investment on capacity building activities for data collectors, with focus on the revision of methodologies, criteria, terms and concepts.
- The strengthening of institutional capacities, in order to ensure the existence of qualified teams, as well as economic and structural resources.
- The inclusion of displacement figures in disaster databases and national indicators linked to the implementation of the Sendai Framework for Disaster Risk Reduction and related national strategies and plans.
- Turn displacement into a priority in disaster governance, bringing about imperative legal and institutional changes.

The above points are essential in the process of making disaster displacement visible in Brazil and stimulating the incorporation of provisions related to displacement in domestic disaster risk reduction strategies. The gaps identified throughout this research project indicate that the improvement of data collection and sharing of information related to displacement in the context of disasters would allow Brazil to develop effective prevention, planning and response strategies. The implementation of durable solutions to disaster displacement depend heavily on enhanced data collection and its availability to foster data-informed decision making.

[15] BRASIL (2016). Ministério do Planejamento, Orçamento e Gestão. PPA 2016-2019 - Relatório Anual de Avaliação Plano Plurianual Ano-base 2016. Available at: <http://www.planejamento.gov.br/secretarias/upload/arquivo/spi-1/ppa-2016-2019/rel_anual_de_avaliacao_ppa_2016_2019_volume_i.pdf>