Brazilian Air Force operations in response to migratory flows: the case of Welcome Operation

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Abstract. This study analyses the Brazilian Air Force (BAF) performance in a migratory crisis operation based on a disaster response process model. Based on a case study, we compare the performance of the BAF during "Operação Acolhida" (Welcome Operation), the Brazilian response to the Venezuelan migratory flow crisis, with a reference process model. The research focused on one stakeholder's role (the BAF) during two years of the studied humanitarian operation, which is still in progress and involves other main actors. This study contributes to the academic literature by validating and suggesting improvements to the disaster response process model proposed by Fontainha et al. [1]. In addition, the paper addresses one military stakeholder's role in a migratory movement operation which aims to fill literature gaps about migratory movements to Brazil and the armed forces' efforts in humanitarian operations.

Keywords: Brazilian Air Force, humanitarian operations, process modelling

1 Introduction

Climate-related and human-made disasters have increasingly impacted communities worldwide [2]. In particular, the migratory crisis is expanding year after year [3], reaching 272 million immigrants by 2019 [4]. Migrants choose to leave their country not because of direct threats, persecution, or risk of death but mainly because they are looking for a better life through work, education, or family reunion [5].

Humanitarian operations (HO) designed to respond to disasters include contracting, purchasing, storing, and transporting supplies, human resources, and equipment [6]. In HO, structuring processes correctly minimises the response time and makes the response operation more efficient and effective [7]. Several important studies on process models for disaster response are identified in the literature, as the analysis, management, and modelling of processes bring benefits - e.g., transparency and enhancement of cooperation and communication - for HO [1].

Disasters demand a response that exceeds civilians' capacity, requiring a risk and disaster management network composed of various actors with different structures, capabilities, resources, and responsibilities. Once the nature of the tasks makes it difficult for a single organisation to perform all the work [8, 9], the number of

stakeholders involved grows, and military organisations become the first and primary respondents supporting civil defence in major disaster response efforts [1].

In response to the massive flow of Venezuelans entering the country, the Brazilian government has triggered the Armed Force (AF) "Operação Acolhida" (Welcome Operation). Venezuela has been exposed to a migratory crisis due to recent years of political and economic instability, leading to Venezuelans' emigration to other countries [10]. More than 5 million Venezuelans have emigrated to other Latin American countries such as Colombia, Peru, Chile, Ecuador, and Brazil [11]. In November 2020, Brazil counted more than 265 thousand Venezuelan refugees and migrants in its territory [12]. Then, since March 2018, the Brazilian Air Force (BAF) has been working together with the Brazilian Army (BA), the Brazilian Navy (BN), and NGOs in Welcome Operation to welcome, identify, shelter, screen, immunise and internalise Venezuelan migrants. To achieve orderly borders, controlled migrant flows, and conditions for internalising migrants, the BAF has contributed by providing support in infrastructure, transport, food, health, and administrative actions [13].

Given the importance of HO in disasters and considering the relevance of armed forces collaboration, this work aims to answer the following question: How does the BAF's performance in response to the Welcome Operation corroborate the literature?

Thus, this study aims to analyse the performance of the Brazilian Air Force in a migratory crisis operation on the Brazilian border through a disaster response process model. Based on a case study methodology [14], BAF's support in Welcome Operation was analysed. The analysis compares the processes carried out by the BAF with the disaster response processes presented by Fontainha et al. [1] after an extensive analysis of academic literature on disaster response process models.

Given the importance of process modelling in HO and considering new cases that can enhance reference process models, our research contributes to the academic literature as we validate and suggest improvements to the disaster response process model proposed by Fontainha et al. [1]. Also, it reduces literature gaps about the Venezuelan migratory flow in Brazil and the armed forces' support for HO.

After this introductory section, Section 2 presents the research methodology. Section 3 brings the case, and Section 4 presents the conclusions and future studies avenues.

2 Methods

This work adopted the case study methodology [14], consisting of six phases: plan, project, preparation, collection, data analysis, and sharing. As planning stage, we defined research focus on the BAF role in the "Welcome Operation" due to its uniqueness [15], as it is the most significant joint HO conducted in Brazil [16].

The project phase defines the research question posed in the introductory section and a research protocol to increase reliability during data collection and analysis.

For data collection, we considered three sources (i.e., documents, interviews, and direct observation) to increase the reliability of this process's outcomes through triangulation [17]. The BAF documents consist of: (i) internal reports from Boa Vista Support Group (GAP-BV) [18], responsible for supplying food in some shelters; (ii)

internal reports from the BAF medical contingent that worked at the Army's field hospital [19]; (iii) internal report from the Field Logistics Support Group (GALC) [20], which acted in support of the GAP-BV cookhouse; and (iv) internal report provided by the Aerospace Command (COMAE) [21], responsible for coordinating the BAF's participation in the studied operation. We assured access to such documents due to one of the authors' official positions in the BAF (they are currently available under specific requests for nonmilitary personnel).

The interviews were semi-structured and were carried out both in-person in Roraima (North Brazil) and online with Welcome Operation military personnel. The interviewees worked in the following positions during the studied operation: (a) Head of Social Communication at the Humanitarian Logistics Task Force (HumLogTF); (b) cooker at GAP-BV; and (c) Chief of the Operations Division at COMAE. In addition, direct observations in field missions made a comprehensive view of GAP-BV structures, HumLogTF, and the shelters that welcomed the Venezuelans possible.

We used a pattern matching technique for the data analysis; we compared empirical data - taken from the reports and direct observation - with the interviews with the military members involved in the operation. Besides, the results were also compared with prognostic models from a theoretical framework of the disaster response process modelling [1]. The disaster response process model by Fontainha et al. [1] adopts the event-driven process chain (EPC) notation, one of the most used business process models worldwide, operationalised through the well-known Bizagi Modeler tool, which models processes based on BPMN notation. Fontainha et al. [1] define two macro processes levels, the generic level and the partial level, which lists the processes carried out by disaster stakeholders at each generic levels. Therefore, this modelling stands out for having several flow alternatives to be followed, making it applicable to all types of disasters [1].

Finally, the sharing stage consists of the publication of the present paper.

3 Case study

The Welcome Operation is a HO supported by governmental and international organizations, United Nations agencies, national and international NGOs (s), and philanthropic and religious entities. The operation is based on three pillars: (a) border order; (b) unassisted Venezuelans shelter; and (c) internalisation [22].

The border ordering pillar aims to organise the Venezuelan migratory flow at the Brazilian border with Venezuela in Pacaraima city (North Brazil). To this end, facilities were built for their reception and identification - Triage Post.

The unassisted Venezuelans sheltering pillar is based on social assistance, aiming to provide decent conditions for accommodation, with daily food, personal hygiene kits, education, and recreational activities [13]. The shelters are managed by the Brazilian Armed Forces and have an approximate capacity of six thousand people.

The third pillar is the internalisation of migrants, aiming to achieve a socioeconomic insertion of Venezuelans in the Brazilian territory, providing more opportunities and reducing the demand for public services in Boa Vista [13].

In this context, the BAF mission in Welcome Operation is to plan, coordinate and control actions that contribute to the operation’s success, increase the dignity of the

migrant population, and cooperate on humanitarian activities in Roraima. The BAF engages in three different areas: (a) food, (b) health, and (c) logistics transport. The BAF supported the operation by providing around 4500 meals (breakfast, lunch, and dinner) a day for six shelters from April 2018 to January 2019. After that, the BAF's food support consisted of onboard snacks for migrants and refugees during internalisation, distributing of more than 4,000 snacks in 2020 [18]. Concerning health activities, the BAF supports Welcome Operation by providing military personnel from other Brazilian locations to work at the Advanced Service Post in Pacaraima and attend the shelters. Regarding the logistics transport function, through the coordination of Aerospace Command, the BAF has a fundamental role in transporting supplies and personnel for the operation, which accounted for 3,800 flight hours through February 2020 [21]. Especially noteworthy is BAF's performance supporting the internalisation, transferring Venezuelans to various Brazilian states.

4 Results and discussions

This section presents the BAF process analysis in Welcome Operation, considering the disaster response processes proposed by Fontainha et al. [1]. Table 1 summarises these processes, detailing whether BAF carried them out during the operation or whether they were provided in BAF legislation. It also indicates which Welcome Operation pillar was involved (border ordering, unassisted Venezuelans shelter, or internalisation).

#1 Recognition of Disaster Occurrence. Da Costa et al. [23] noted that it is not up to BAF to recognise the occurrence of a disaster. In these situations, the initial response is the state, municipal government, or the Federal District responsibility. The BAF's involvement occurs as requested by the competent authority, cooperating with the National System of Civil Defence and Protection [24]. In the Welcome Operation, the Ministry of Defence directive requested the BAF's participation, followed by an order from the Brazilian Air Force Chief of Staff to the Aerospace Command.

#2 Assessment of the current situation. Few processes are carried out for the assessment of the current situation (# 2), since five of the ten processes are not in BAF´s legislative scope [23]. Regarding the five processes in BAF's scope, only the partial process "deploying disaster management centre" (2.1) was not carried out in Welcome Operation. The partial process of "deploying emergency team" (2.2) occurred through health professionals participation called to compose the field hospital set up to assist Venezuelans and provide medical assistance for shelters. The partial process "deploying exploratory team" (2.3) took place through reconnaissance missions to the locations where the first two phases of the operation were carried out. In these missions, the process of "assessing local infrastructure" (2.5) was also conducted. Finally, "deploying emergency plans" (2.10) was partially verified by engaging the military in the operation's first and second pillars.

#3 Search and rescue. In the medical area, the Aeronautical Health Directorate (the organisation responsible for coordinating health activities in BAF) summons health-related military personnel from all over Brazil to work in the Advanced Service Post in Pacaraima during the ordering of the border and in service to Boa Vista´s shelters to carry out "perform screening for medical care" (3.2) and "performing medical care" (3.3) [25]. This fact reinforces Airpower's strong points of mobility and readiness [26]. Although all three processes are included in BAF legislation, "performing search and rescue" (3.1) was not mentioned in the reports or the interviews because it was not needed, given the characteristics of the disaster, as confirmed by interviewee C.

#4 (R)establishing infrastructure during the response. The GALC organisation (which provides logistical support for deployed operations involving the Air and Aeronautical Units during interagency, humanitarian and joint operations) [13] supported the cookhouse and the hosting of the GAP-BV to increase its service capabilities. This finding confirms the realisation of the process of "deploying temporary infrastructure for service to the response" (4.5) through the assembly and installation of tents that served as pantries, storage for stock, and accommodations. Furthermore, GALC, together with the supply subdivision, were responsible for managing the "logistical material and mobilised equipment" (4.2) of the cookhouse to increase the cookhouse's supply capacity for the GAP-BV [20]. All these named processes took place in favour of providing food for Venezuelans in the sheltering phase. These facts reinforce Airpower's strong points concerning mobility and readiness [17]. "Requesting infrastructure restoration" (4.1) is a task for the Civil Defence. "Clearing main roads and restoring access routes" (4.3) is beyond the BAF´s scope; the Army usually accomplishes this task [23].

#5 Resource request for the response. Most of the partial processes #5 are outside the BAF's scope [23]. However, the "receiving donations/funds" (5.10) process was partially carried out. According to interviewee A, the BAF received and transported donations from other states to Boa Vista and distributed these donations to migrants.

#6 Resource transport during the response. According to interviewees A and C, the BAF has a fundamental role due to the geographical location of Boa Vista and its difficulties being accessed by other modes, with air being the principal means used by HumLogFT. This fact reinforces Airpower's strong points concerning range and penetration [26]. Except for the partial process "scheduling transport" (6.3), interviewee C confirmed that, through the use of aerial means, the COMAE together with Air Squadrons performed all other processes, which included the processes "selecting the transport route" (6.2), "preparing shipping documents of resources" (6.4) and "tracking and locating resources in transit" (6.7), which, according to Da Costa et al. [23], did not have legal support in the BAF but did occur at Welcome Operation.

The partial process "scheduling transport" (6.3) does not occur in Welcome Operation since COMAE only receives Ministry of Defence demands. From that order, it is defined which air squadrons will carry out the transportation, according to their availability and needs, as all air transport aviation units can be employed in this

operation. Transportation is necessary for all phases of Welcome Operation, whether to transport materials, stakeholders, or even the beneficiaries; thus, their partial processes are present in the three pillars.

#7 Service to the population. Despite the field hospital set up by the Army, BAF personnel work in medical care with the affected population. This fact confirms the accomplishment of the processes of "receiving resources" (7.2) and "delivering products to the affected population" (7.7), which take place through the drugs received and later distributed to Venezuelans, both in border ordering and in sheltering [19].

Other partial processes such as "deploying inventory policy" (7.3), "identifying and marking resources" (7.4), "storing products required for the response" (7.5), and "allocating resources according to the requests" (7.6), are not identified in BAF legislation [23]. Finally, "accommodating the affected population" (7.1) process is not included in BAF legislation; however, according to interviewee C, the Army and NGOs participated in this process during Welcome Operation.

#8 Demobilisation of the operations. The reversal of the means employed by the BAF to assemble provisional infrastructure occurred in early 2019 when the contracting of an outsourced company was engaged in supplying the food in the shelters previously supported by the BAF. Thus, the process of "demobilising provisional infrastructure" (8.2) was confirmed for dismantling the assembled tents and retraction of the materials used. In addition, the equipment used to increase the production capacity of the GAP-BV cookhouse was also collected [18]. It is noteworthy that although the BAF´s food support to the shelters ended, there was still food support in place with onboard snacks during internalisation, air transport, as well as support from its health professionals, according to interviewee C. Finally, although "demobilising unused resources in the response" (8.3) is not included in BAF legislation [23], interviewee B confirms that this process was accomplished.

#9 Response support operations. In operation with the active participation of several sectors and entities, "establishing communication with stakeholders" (9.1) occurs during all operation phases and is fundamental to its success. The three interviewees confirmed this process since it was necessary to communicate with federal, state, municipal, and even international organisations (such as UNHCR).

In "assessing the disaster response performance" (9.4) and "creating asset and inventory report" (9.10), the collected data show that the BAF conducted those processes during the operation. The subsistence team produced a daily report during the sheltering phase, including the number of lunch boxes produced, the consumed food quantity, the menu served, and the identified obstacles, for example. Another example is the medical team's daily visits during ordering the border and sheltering. It is also important to comment on the hours flown by BAF aircraft during all the response phases. In addition, regarding the "operating operational and support systems" (9.2) process, the SPA-C² and Hercules systems used for planning, execution and control of operational activities were used for operational reports [27].

#New processes. Processes that are not embraced in the literature were observed in the case, such as “holding meetings at the end of the day”, identified in the three pillars of the Welcome Operation. We suggest their insertion in the literature. Two other processes - “plan to replenish the inputs” and “plan contingent replacement”- were validated by all interviewees. These processes were needed mainly during the first two operation pillars: border ordering and shelter, since after very long periods, those involved in the response will experience physical wear and tear emotional distress, which can compromise their performance in the Operation.

Furthermore, "Evaluate the logistical transport to be employed", that is, to analyse the possibilities that exist to transport the material and personnel necessary to the affected place, is essential and differs from the macro process “resource transport during the response” (# 6) since this evaluation occurs in the response's planning phase, as part of the assessment of the current situation (# 2). The identification of these processes in a major mission can contribute to the improvement of the Fontainha et al. [1] model.

Finally, it was possible to see that all macro processes of the generic level also appeared in the case, except for recognition of disaster occurrence (#1) (to decree a state of emergency or public calamity), which is up to the state, federal district, or municipality [24]. However, several partial-level processes are outside the scope of BAF norms and legislation, with only 27 considered in BAF legislation [23]. Among these 27 processes, only two were not carried out. This was because they were not needed due to the disaster's characteristics or because the Navy or Army were already carrying them out. There are still three processes that are not in the BAF’s scope but were accomplished, according to Fig. 1.

We identified some improvements points in the BAF performance during Welcome Operation. The “lack of aircraft to attend exclusively to Welcome Operation” is a limitation due to the low number of aircraft available. This fact reinforces Airpower’s weak infrastructure dependency points and limited stay [26]. However, the literature considers the use of Airpower as an advantage of military participation in HO, including military capabilities (such as mobility, readiness, range, and penetration) used to evacuate injured people, transport supplies and people, or aerial reconnaissance [26].

5 Conclusion and recommendation

This paper analyses the BAF’s performance in the Welcome Operation. We contribute to the academic literature by validating and suggesting improvements to the disaster response process model proposed by Fontainha et al. [1]. As a result, four processes not listed in the literature were identified (“evaluating the logistical transport to be employed”, “holding meetings at the end of the day”, “plan to replenish the inputs”, and “planning contingent replacement”). These processes are not specific to the military and can be carried out by different organisations other than the military (e.g., NGOs), thus increasing tehir applicability. This finding reiterates the need to analyse different disaster response operations from various stakeholders' perspectives, aligned with Da Costa et al.’s [23] recommendations, making it possible

to identify other processes from those already presented in the literature, thus improving the existing literature reference model.

We also highlight Airpower's strong mobility, readiness, range, and penetration in the BAF participation at Welcome Operation, mainly through transports logistics and personnel mobility to a distant point such as Roraima. Opportunities for improvement appear in infrastructure dependency and limited stay because of the low availability of aircraft. A higher number of aircraft can improve BAF performance for other disaster responses. Finally, as this work is limited to the BAF´s role during Welcome Operation, which is still in progress, we suggest a similar analysis at the end of the mission, not only about the BAF's role but also for the Brazilian Armed Forces.

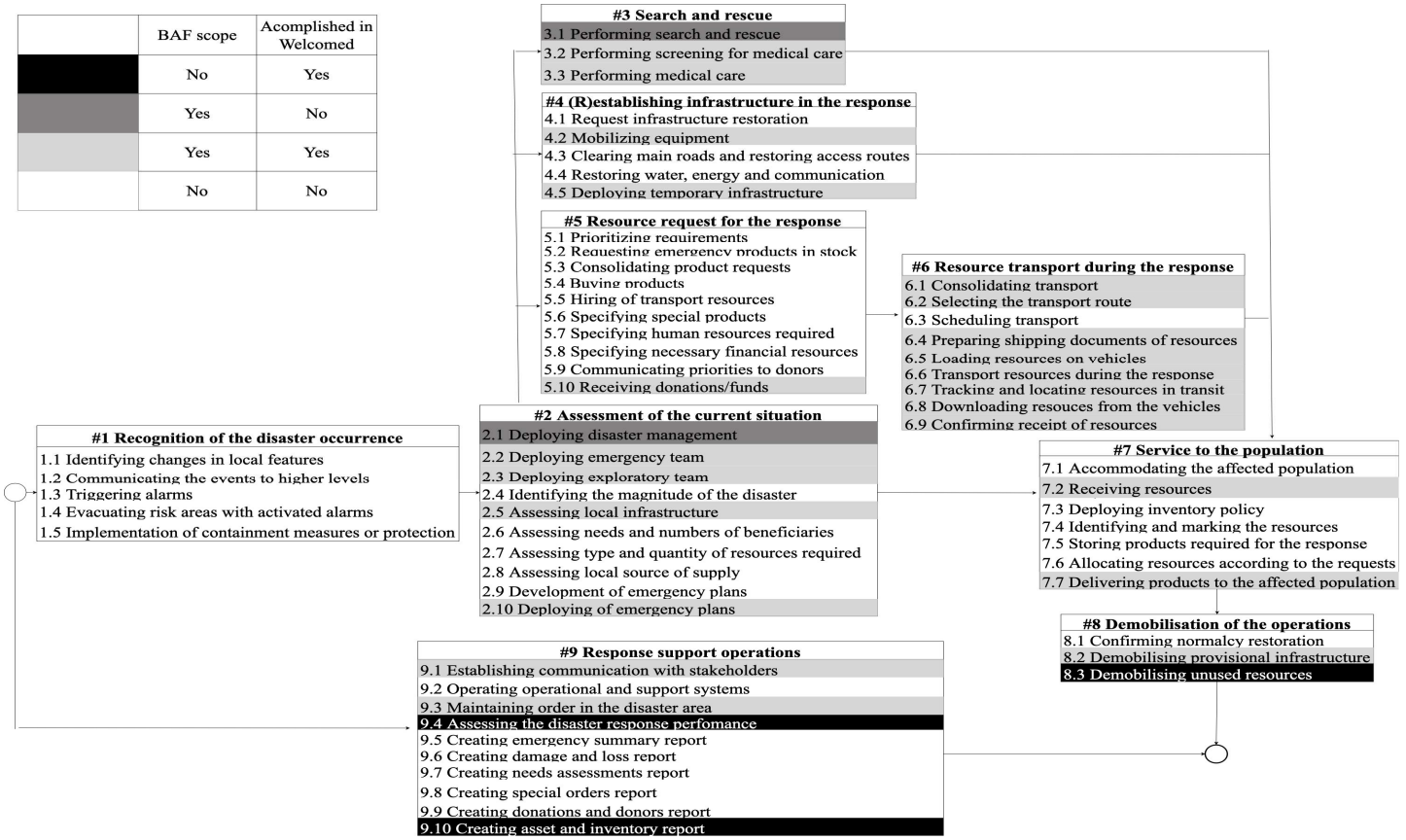

Fig. 1. Comparison of BAF response processes at Welcome Operation with the literature (adapted from Fontainha et al. [1])

Table 1. Partial level of response process in Welcome Operation.

Generic Process	N°	Partial Process	Reference	Pillar
#2 Assessment of the current situation	2.1	Deploying disaster management	Not prescribed	-
	2.2	Deploying emergency team	Interviewee C	1º e 2º
	2.3	Deploying exploratory team	Interviewee C	1º e 2º
	2.4	Identifying and magnitude of the disaster	Not prescribed	-
	2.5	Assessing local infrastructure	Air Force Command (2018c), Interviewee B and C	1º e 2º
	2.6	Assessing needs and numbers of beneficiaries	Out of scope	-
	2.7	Assessing type and quantity of resources required	Out of scope	-
	2.8	Assessing sources and locations of supply	Out of scope	-
	2.9	Development of emergency plans	Out of scope	-
	2.10	Deploying emergency plans	Interviewee C	1º e 2º
#3 Search and rescue	3.1	Performing search and rescue	Not prescribed	-
	3.2	Performing screening for medical care	Air Force Command (2018d)	1º e 2º
	3.3	Performing medical care	Air Force Command (2018d)	1º e 2º
#4 (R)establishing infrastructure in the response	4.1	Request infrastructure restoration	Out of scope	-
	4.2	Mobilising equipment	Air Force Command (2018c)	2º
	4.3	Clearing main roads and restoring access routes	Out of scope	-
	4.4	Restoring water, energy and communication	Out of scope	-
	4.5	Deploying temporary infrastructure	Air Force Command (2018c)	2º
#5 Resource request for the response	5.1	Prioritising requirements	Out of scope	-
	5.2	Requesting emergency products in stock	Out of scope	-
	5.3	Consolidating product requests	Out of scope	-
	5.4	Buying products	Out of scope	-
	5.5	Hiring of transport resources	Out of scope	-
	5.6	Specifying special products	Out of scope	-
	5.7	Specifying human resources required	Out of scope	-
	5.8	Specifying necessary financial resources	Out of scope	-
	5.9	Communicating priorities to donors	Out of scope	-

Generic Process	N°	Partial Process	Reference	Pillar
	5.10	Receiving donations/funds	Interviewee A	1º e 2º
#6 Resource transport during the response	6.1	Consolidating transport	Interviewee C	1º, 2º e 3º
	6.2	Selecting the transport route	Interviewee C	1º, 2º e 3º
	6.3	Scheduling transport	Out of scope	-
	6.4	Preparing shipping documents for resources	Interviewee C	1º, 2º e 3º
	6.5	Loading resources on vehicles	Interviewee C	1º, 2º e 3º
	6.6	Transporting resources during the response	Interviewee C	1º, 2º e 3º
	6.7	Tracking and locating resources in transit	Interviewee C	1º, 2º e 3º
	6.8	Downloading resources from the vehicles	Interviewee C	1º, 2º e 3º
	6.9	Confirming receipt of resources	Interviewee C	1º, 2º e 3º
#7 Service to the population	7.1	Accommodating the affected population	Out of scope	-
	7.2	Receiving resources	Air Force Command (2018d)	1º e 2º
	7.3	Deploying inventory policy	Out of scope	-
	7.4	Identifying and marking the resources	Out of scope	-
	7.5	Storing products required for the response	Out of scope	-
	7.6	Allocating resources according to requests	Out of scope	-
	7.7	Delivering products to the affected population	Air Force Command (2018d)	1º e 2º
#8 Demobilisation of the operations	8.1	Confirming normalcy restoration	Out of scope	-
	8.2	Demobilising provisional infrastructure	Air Force Command (2018c)	2º
	8.3	Demobilising unused resources	Interviewee B	2º
#9 Response support operations	9.1	Establishing communication with stakeholders	Interviewee A, B and C	1º, 2º e 3º
	9.2	Operating operational and support systems	Out of scope	-
	9.3	Maintaining the order in the disaster area	Interviewee B and C	1º, 2º e 3º
	9.4	Assessing the disaster response performance	Air Force Command (2018b)	1º, 2º e 3º
	9.5	Creating emergency summary report	Out of scope	-
	9.6	Creating damage and loss report	Out of scope	-
	9.7	Creating needs assessments report	Out of scope	-
	9.8	Creating special orders report	Out of scope	-
	9.9	Creating donations and donors report	Out of scope	-
	9.10	Creating asset and inventory report	Air Force Command (2018b)	1º e 2º

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