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The value of secondary use of data generated by non-governmental organisations for disaster risk management research: evidence from the Caribbean

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Abstract

For hazard prone regions such as the Caribbean, Non-Governmental Organisations (NGOs) that engage in Disaster Risk Management (DRM) generate data can be used to inform DRM research which generates a deeper understanding of the nature of risk and appropriate responses. Increasingly, researchers are encouraged to develop research partnerships with other experts to expand the DRM knowledge base, understand stakeholder perspectives and achieve value for money from research funds. Research partnerships between these NGOs and academic researchers (NGO-Researcher partnerships) can be particularly useful in advancing this knowledge base as it taps into the DRM data generated by NGOs. Using a case study of DRM research in the Caribbean region, this paper seeks to demonstrate the value of NGO-Researcher partnerships based on secondary data generated by DRM NGOs. We used a mixed methods approach, combining a scoping review of peer-reviewed articles that utilise secondary data on hurricanes in the Caribbean region with semi-structured interviews with representatives of NGOs and academic institutions in the Caribbean region. Results of the scoping review indicate that the application of secondary analysis of NGO-generated data to existing DRM research is limited. Interviews identified a general willingness of NGOs to engage in NGO-Researcher partnerships, but also noted challenges, including limited NGO capacity to share data and the persistence of more extractive forms of NGO-Researcher partnerships. The findings emphasise the importance of creating or strengthening NGO-Researcher partnerships that are based on equitable distribution of costs and benefits of research partnerships. For example, the study highlights the importance of DRM research based on partnerships between academic researchers and smaller and local NGOs which can contribute towards generation of DRM knowledge and increasing DRM effectiveness. The paper further recommends a collaboratory model to DRM research that enables transnational and participatory research between diverse stakeholders from within the Caribbean region and globally.

Keywords

37 Disaster Risk Management; Research partnerships; Secondary data; Caribbean; NGOs

38

39 **1 Introduction**

40 Non-governmental organisations (NGOs) play an important role in addressing many development
41 challenges (Lewis & Kanji, 2009), including disaster risk management (DRM) which contributes to the
42 goals of the Sendai Framework (United Nations, 2015). NGOs working on DRM can potentially
43 contribute to initiatives that target populations that are particularly vulnerable to different disaster risks
44 (Kim & Jung, 2016; Sledge & Thomas, 2019). NGOs mobilise resources and generate, utilise, and
45 manage knowledge and capacity in support of DRM (Delisle et al., 2005). They also implement and
46 evaluate DRM solutions (Khan & Rahman, 2007; Walker et al., 2005). Data collected by NGOs as part
47 of these activities are a potentially valuable resource for research that informs disaster management.
48 However, the actual use of these existing data by researchers to advance understanding of DRM has
49 been limited to date. This paper uses a case study of DRM research in the Caribbean region to
50 understand the nature of partnerships between NGOs and research institutions—specifically those based
51 on the secondary data—and their contribution towards DRM research in the Caribbean and globally.
52 Partnerships are collaborations between organisations that are based on mutual trust and joint action
53 towards achievement of shared goals (Coston, 1998).

54 The greater research use of data generated by NGOs from DRM activities aligns with the calls for
55 greater synthesis, sharing and re-use of existing data for academic and policy research across disciplines
56 (Donnelly et al., 2018; Johnston, 2017). For example, data sharing underpins the Sustainable
57 Development Goal 17 on partnerships (Global Partnership for Sustainable Development Data, 2018;
58 United Nations, 2020). Disaster finance donors including government departments such as the UK’s
59 former Department for International Development (DFID) (now FCDO), USAID, the Danish
60 International Development Agency (DANIDA) and the Canadian International Development Agency
61 (CIDA), specifically encourage partnerships between government, NGOs and academic institutions to
62 support global disaster management efforts (Bradley, 2006, 2008; Koehn, 2012; Mawdsley, 2015). In
63 this study, these are referred to as NGO-Researcher partnerships, where ‘Researcher’ includes
64 international and national academic institutions and thinktanks.

65 NGO-Researcher partnerships can improve value for money and impact of development work more
66 broadly (e.g. Skovdal and Cornish, 2015; Stevens et al., 2013; Thornton et al., 2017) through the
67 ‘application of research and evidence in development policy and practice [which] can help save lives,
68 reduce poverty, and improve the quality of life’ (Court & Young, 2006, p. 85). An assessment of the
69 extent to which existing DRM research is based on secondary data collected or held by NGOs can
70 potentially enhance an understanding of how NGO-Researcher partnerships can be used to advance
71 DRM research. Data collected by NGOs have been identified as a ‘vital tool for disaster response’, due
72 to their role in enabling effective DRM responses (IFRC, 2017). Data are defined here as primary or
73 secondary information relating to the nature or impact of disasters on natural and socio-economic

74 systems. The analysis of these secondary data, defined as existing data which were originally collected
75 for another purpose to answer novel research questions, can add value to existing research and inform
76 policy by incorporating contextual information, increasing depth of understanding and introducing a
77 comparative dimension (Irwin & Winterton, 2011).

78 However, NGO-Researcher partnerships also need to be equitable. Equitable research partnerships are
79 characterised by co-creation of knowledge, co-generation of shared research agenda and co-decision
80 making, e.g. see Brun and Lund (2010). These partnerships recognise and address all partners' diverse
81 needs e.g. skills development, advocacy, training (Aniekwe et al., 2012), as opposed to favouring one
82 partner's needs. Partners in an equitable partnership are also aware of potential cultural differences
83 between them and strive to build trust between them (Harris & Lyon, 2013).

84 This paper explores the use of secondary data generated by NGOs in NGO-Researcher partnerships
85 using a case study DRM research in the Caribbean region. The Caribbean is one of the most hazard
86 prone regions of the world, with hurricanes and earthquakes being the primary disasters (Rao &
87 McNaughton, 2019). The threat posed by disasters to key development sectors such as tourism makes
88 disaster management a priority issue. (Seraphin, 2019). The region exhibits a strong commitment to
89 regional collaboration in DRM. DRM is reflected as a key policy issue at different levels of government
90 (Hollis, 2015; Kirton, 2013). However, gaps still exist at the regional and national levels in DRM, for
91 example in developing pre-disaster recovery plans (Hori et al., 2020). DRM research and partnerships
92 are proposed for addressing these policy gaps (Lacambra et al., 2015). Consequently, interest in
93 partnership- and research-based DRM has increased. NGOs working in the Caribbean have also
94 launched initiatives that leverage academic research capacity to advance DRM research (Few et al.,
95 2015). This suggests that NGO-Researcher partnerships for DRM research are taking root in the region.
96 This research combines data from a scoping study and interviews with representatives from NGOs and
97 research institutions to understand the extent of use of secondary data generated by NGOs in DRM
98 research in the region and how NGO-Researcher partnerships can be used to advance this type of
99 research.

100 This study finds that most published studies use secondary data generated within a specific context
101 rather than as an integral part of the analysis. The benefits of data sharing and the need for equitable
102 research partnerships are acknowledged by academic researchers and NGOs in the Caribbean, but there
103 are persistent barriers to the formation of these partnerships, especially relating to NGOs' willingness
104 to share data. The research argues that opportunities for using secondary data generated by NGOs in
105 support of DRM research in the Caribbean and globally include ensuring that NGOs, especially smaller
106 and local NGOs, have capacity to generate, analyse, store and share good quality data and participate
107 equitably in NGO-Researcher partnership. This would reduce the costs of disasters and DRM actions

108 by tapping into existing knowledge to further understand the nature of disasters, their impacts, and the
109 effectiveness of DRM initiatives.

110 **2 Methods**

111 This research focused on DRM linked to hurricanes in the Caribbean region which is the area straddling
112 the Caribbean Sea. Data on occurrence of disasters indicate that hurricanes are experienced by most
113 countries in the region while the other hazards tend to be localised and experienced by fewer countries
114 in the region (López-Marrero & Wisner, 2012). Consequently, fatalities and losses from hurricanes are
115 found to be cumulatively higher (as compared to other disasters) for the region (López-Marrero &
116 Wisner, 2012). Other disasters such as floods and landslides, even though equally or more severe and
117 frequent are likely to be localised within countries within the region. Some disasters such as storms and
118 flooding are also mostly reported after hurricanes (Rao & McNaughton, 2019). As a result of the links
119 between hurricanes and other hazards such as storms and flooding, assessments of hurricane impact and
120 disaster management approaches to hurricanes in the Caribbean cover these related hazards.

121 The research used data from a scoping review (Moher et al., 2009; Peters et al., 2015) which was
122 supplemented by data from interviews with NGOs and research institutions in the Caribbean to gain a
123 greater understanding of both the nature of NGO data use in DRM. For the scoping review, the research
124 considered papers that used data collected or provided through NGOs and were recorded in research
125 databases. Scoping studies enable a relatively rapid method of ‘mapping’ existing research and can be
126 used to identify research gaps and make recommendations for future research, particularly in cases
127 where the body of literature has not yet been reviewed (Arksey & O'Malley, 2005; Peters et al., 2015).
128 The systematic search focused on papers published (in English) between January 2010 and December
129 2018 in the online databases Scopus and Web of Science. The list of terms used in the search are
130 presented in Supplementary Material 1.

131 The interviews focused on partnerships between NGOs and research institutions in the Caribbean.
132 Interviews were conducted with individuals representing NGOs and academic institutions involved in
133 disaster management in the Caribbean region. Requests for interviews were sent to 15 organisations in
134 the Caribbean sub-region. Nine individuals representing NGOs, academic institutions and donor
135 agencies in the sub-region accepted the invitations and were interviewed (table 1). Interviews focused
136 on the application of secondary data for research and the nature of NGO-Researcher partnerships that
137 underpinned this research. Purposive sampling was used to identify NGOs and research institutions
138 working on DRM in the region. Interviews were semi-structured around current state of use of
139 secondary data to inform research and the nature of research partnerships underpinning them. Nine
140 interviews were conducted with representatives of 8 organisations (table 1) between October 2018 and
141 August 2019. The interviews were audio recorded and transcribed. Transcripts were analysed using

142 framework analysis. This is a form of thematic analysis and involves identifying, analysing, and
 143 reporting patterns (themes) within data, and the method is independent of theory and epistemology
 144 (Braun and Clarke, 2006).

145

146 Table 1: List of interviewees

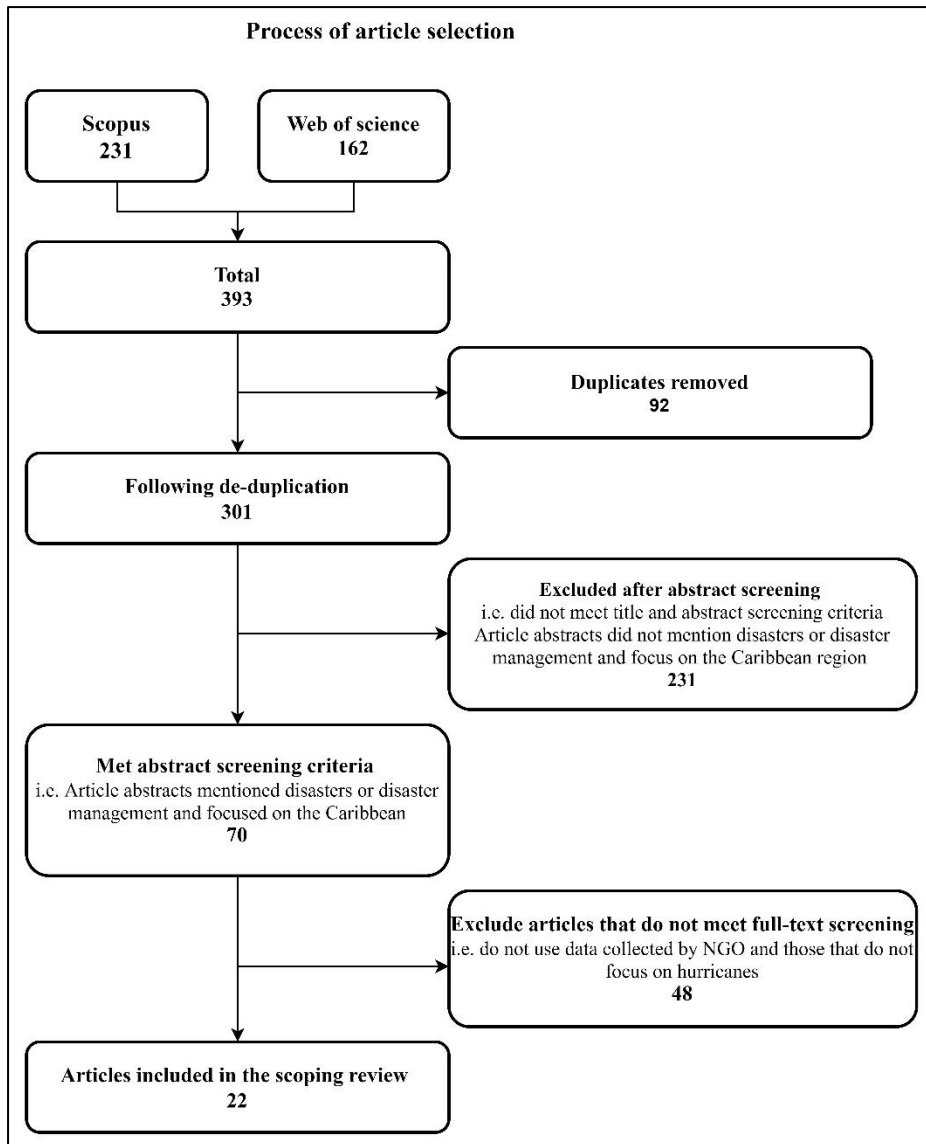
ID	Name of organisation	Type of organisation	Size of organisation	Operation level
NGO1	The Caribbean Natural Resources Institute (CANARI)	Environmental	Large	Regional
NGO2	The International Federation of Red Cross and Red Crescent Societies (IFRC)	Humanitarian	Large	Regional
NGO3	Jamaica Environment Trust (JET)	Environmental	Small/medium	National
NGO4	Caribbean Coastal Area Management Foundation (C-CAM)	Environmental	Large	Regional
NGO5	The Nature Conservancy (TNC)	Environmental	Large	Regional
NGO6	The International Federation of Red Cross and Red Crescent Societies (IFRC)	Humanitarian	Large	Regional
DA1	Anonymous ^a	Donor agency	Large	International
URI	University of West Indies	Academic	Large	Regional
UR2	University of West Indies	Academic	Large	Regional

147 ^a Preferred to remain anonymous

148 **3 Results**

149 **3.1 Characteristics of published studies**

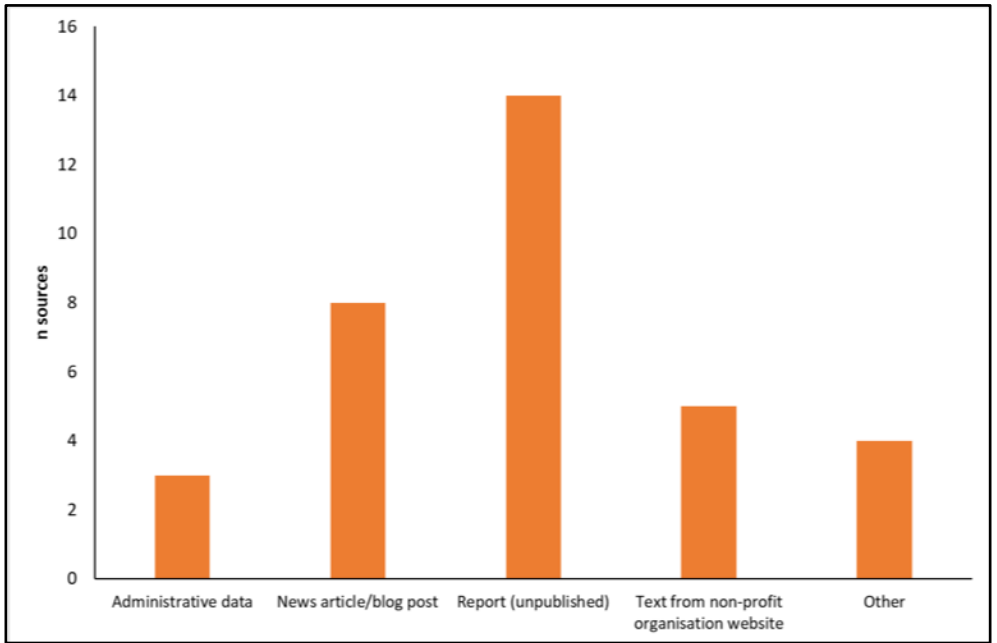
150 A total of 393 articles were generated through searches in Web of Science and Scopus. The screening
 151 process (see Figure 1) generated 22 articles which focused on disaster management for hurricanes in
 152 the Caribbean. For geographical location, 55% of the studies (n=12) focused on North America, with
 153 45% (n=10) studies in Central America & the Caribbean. One study focused on more than one region.
 154 The USA and Haiti were the most frequent focus countries in the studies, with 50% (n=11) of studies
 155 focusing on the USA, and 23% (n=05) concentrating on Haiti.



156

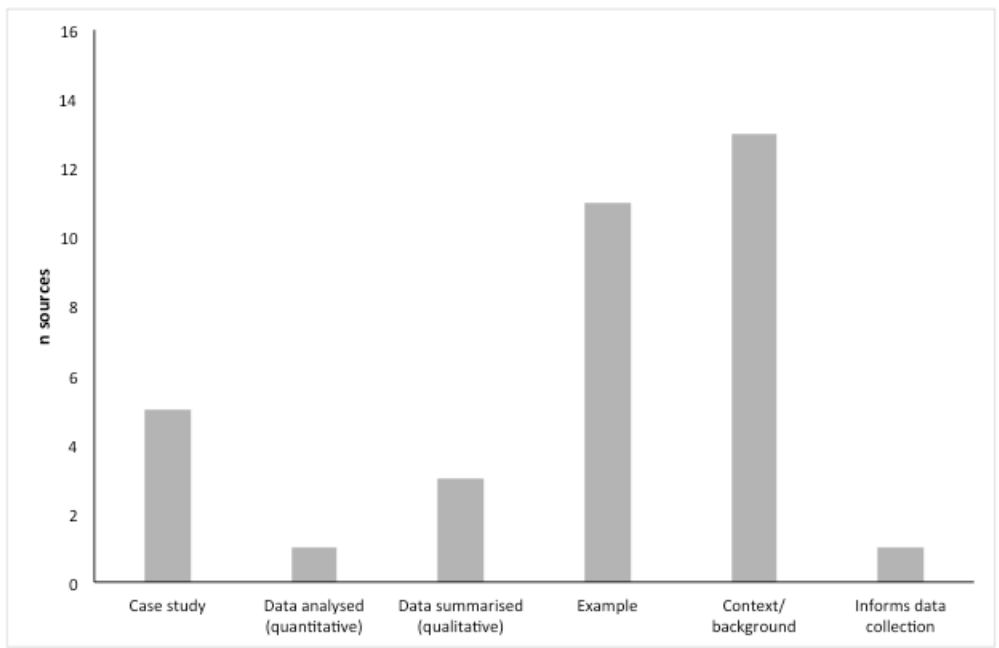
157 Figure 1: Flow diagram of the process of article selection. Adapted from Moher et al. (2009).

158 Over 86% of studies (n=19) addressed more than one type of disaster event, and the remaining three
 159 studies discussed hurricanes only. The other types of event included flooding, drought, storm,
 160 earthquake, tsunami, volcano, fire, landslide, and ‘disasters’. Of the 22 included studies, 77% (n=17)
 161 addressed the management of ‘disaster’ events in general, and these were categorised under the term
 162 ‘disasters’. Secondary data collected by the International Federation of Red Cross and Red Crescent
 163 Societies and/or Red Cross National Societies were used in 45% (n=10) of studies. Eight studies (36%)
 164 used data from more than one NGO.



165 Figure 2: Type of data collected by NGOs used in the included articles (n=22). 10 studies used more than one
 166 source of data e.g. reports and website information.

167 The type of data were categorised into five categories: administrative data; news article/blog post; report
 168 (unpublished); text from NGO website; and other (Figure 2). Unpublished reports produced by NGOs
 169 provided a source of data in 64% (n=14) studies. The second most frequent type of data used were news
 170 articles/blog posts, followed by text from NGO websites, 'other' and administrative data. The category
 171 of administrative data included NGO-led statistics and databases. The 'other' types of data included
 172 books, interviews, and an online training course.



173 Figure 3: How secondary data collected by NGOs were used in the articles (n=22)

174 How the secondary data were used was categorised into six groups: case study; context/background;
175 data analysed (quantitative); data summarised (qualitative); example; and informs data collection
176 (Figure 3). Most frequently, NGO data were used as context/background information (38%; n=13) or
177 examples (32%; n=11) in the academic papers included. Five studies used NGO data to inform case
178 studies, and three studies summarised NGO data (qualitative). Only one study applied quantitative
179 analysis of NGO data, and one study used NGO data to inform data collection.

180 **3.2 Challenges of using NGO data in DRM research**

181 Generally, both NGOs and academic researchers interviewed noted the importance of secondary DRM
182 data to their work. Interviewees identified secondary data as important to their work, with UR2 and
183 NGO3 indicating that most of the data used in their research was derived from secondary sources. NGOs
184 and university researchers indicated that secondary data were used to inform further research. UR2
185 noted that these data were *'important in terms of knowing what has been done and preventing yourself*
186 *from repeating work'*. This reflected the findings from the scoping review where secondary analyses
187 were mostly used to inform context and provide examples of what had already been done by other
188 organisations. As indicated by NGO3, secondary data analysis is also useful in understanding the basis
189 for DRM decision making by different actors, for example in understanding the evidence used in
190 government decision making. Three overarching themes were identified: (i) (un)willingness to share
191 data and (lack of) awareness of existing data; (ii) quality and compatibility of secondary data; (iii)
192 importance of partnerships for enhancing secondary data-based DRM research. The first two themes
193 relate to challenges of using this secondary data generated by NGOs to inform DRM research while the
194 third one relates to the role that NGO-Researcher partnerships could play in enhancing this research.
195 These themes are discussed in the following sub-sections.

196 **3.2.1 (Un)willingness to share data and (lack of) awareness of existing data**

197 Qualitative data were mostly generated and shared by NGOs represented by the interviewees. Most
198 interviewees indicated that they generated and used qualitative data even though they needed both
199 qualitative and quantitative data for DRM research. NGOs' willingness to share data was discussed by
200 many of the respondents. Most NGO respondents believed they were responsive to sharing their own
201 data with peer organisations and academic institutions. NGO1 (CANARI) described an example of data
202 sharing between different organisations involved in a regional network: *'all of that data gets put*
203 *together...so we do share information'*. Interviews also indicated that NGOs were willing to share their
204 data so that they could expand the impact of their work amongst their civil society peers. For example,
205 NGO1 noted: *'We tend to share lessons from piloting then [synthesise them as] best practices [and]*
206 *guidelines...We are promoting and advocating that civil society has a role and does good work'*. UR1
207 (University of West Indies) also indicated that data sharing was seen as an extension of data's usefulness

208 and prevented research from being 'extractive' by noting that 'it is important to share that data back
209 with the NGOs so they can use it for their own purposes'.

210 However, (un)willingness by NGOs and government actors in the Caribbean was pointed out as a barrier
211 to extended use of secondary data in analyses. NGO1 (CANARI) commented: 'We spend a lot of time
212 collecting and pulling together a lot of information. It's quite frustrating' adding that 'one of the main
213 things, culturally, a barrier in the Caribbean is that people do not share data', attributing this to the
214 perception that 'knowledge is power kind of thing...[It's the attitude that] because we collected it, that
215 gives us power'. NGO3 (JET) mentioned governments' unwillingness to share DRM data: 'We ask for
216 the data but we don't always get it'. This suggested that data was considered to generate leverage over
217 DRM knowledge. This sentiment was also echoed by NGO2 (IFRC) who noted that '[data] is not
218 always seen as something people should have access to...it's taken, controlled. It's locked [away] and
219 that's a big problem'. For example, UR1 and UR2 (both from the University of West Indies)
220 highlighted how some data had been commodified, mostly by government, with academic users having
221 to pay for it. URI noted that: 'There's certain data you have to pay for. Not that it's exorbitant...but it's
222 a barrier'.

223 Potential users' unawareness of the existence of secondary data and availability of data in shareable
224 formats also presented barriers to data access and use. NGO1 noted that their data were publicly
225 available on 'a platform linked to [their]...website...[which] allow[ed] discussion forums, blogging,
226 posting [and] posting of [new] data', adding that 'I don't think we do a great job of getting things out
227 there and generating enough visibility and awareness...(the data) exist[s] to be used'. NGO4 (C-CAM)
228 indicated that they were 'updating...[their] website and uploading some of...[their] reports' which
229 suggested that some of the reports were kept offline. NGO2 and URI indicated how non-digitised data
230 had been lost when disaster hit NGO and government offices respectively.

231 Online availability of data was a factor of NGOs' data analysis and storage capacity. The transformation
232 of raw data into products that could be shared in a suitable form for re-use requires the investment of
233 time and technical expertise, which are sometimes not available within NGOs. Donor requirements for
234 open data were pushing NGOs to explore options for quicker data digitisation, analysis, and storage.
235 NGO2 and URI noted that while they collected a substantial amount of data, some NGOs were limited
236 by their capacity to store and analyse data.. For example, NGO3 highlighted how availability of data in
237 online repositories was dependent on financial resource capacity. These capacity gaps prevented NGOs
238 from responding to requests for secondary data, which according to NGO6 were important especially
239 in disaster response when data was required in real time. However, NGO2 indicated that while it was
240 easier to use digital tools during data collection to enable quicker data digitisation, this risked alienating
241 the communities who were considered partners in the DRM process.

242 Inter-institutional/personal trust and pre-existing partnerships played a key role in determining whether
243 requests for data sharing would be successful or not. UR1 indicated that *'the main challenge is that if*
244 *you don't know people in the organisations who trust you then you're less likely to get data'*. NGO3
245 also noted a *'mistrust between agencies'*, further adding: *'we don't trust them either, they don't trust us*
246 *because they think we're going to get these files and manipulate them in some way or present something*
247 *to the public that may be inaccurate'*. Academics were thought to withhold their data for its publication
248 value. NGO5 (TNC) detailed: *'There's universities that have their datasets but it's sometimes hard to*
249 *get those from the universities'* and explained that *'it's usually because it's somebody's research and*
250 *they want to publish it'* whereas NGO workers *'are not compensated by how much we publish'*. UR1
251 identified another reason for the general averseness to the sharing of data: *'People keep certain data*
252 *close. Vital data'*, further adding that *'if you don't know people in the organisations that trust you then*
253 *you're less likely to get the data'*. NGO3 highlighted an instance when governments preferentially
254 responded to requests for data from some organisations while *'withholding of information*
255 *from...certain types of organisations'*.

256 Beyond willingness to share, ethical guidelines and donor regulations prevented NGOs from making
257 raw data openly accessible. Speaking about a recent project with a UN agency, NGO1 noted an example
258 of partnerships which involved the transfer of data's Intellectual Property rights to the donors, with
259 requirements that data would only be made open access and sharable *'until it...[had] been approved*
260 *[by the donor]'*. NGO1 and NGO4 indicated that in the absence of explicit consent from the research
261 participants, raw data could not be shared with third parties. Instead, most publicly available data for
262 secondary analysis were in the form of processed findings e.g. *'case studies and reports, written*
263 *material, [and] communication material'* (NGO1) as opposed to raw data.

264 However, NGOs indicated that they applied limited to no ethical guidelines during primary data
265 collection, meaning that some data lacked consent from the communities about sharing of raw data.
266 NGO1 noted: *'[We] don't necessarily get detailed consent [from the participants relating to the sharing*
267 *of data]'*. NGO3 also indicated the absence of formal institutional policy on ethics of data collection
268 but noted that they used *'release...or waiver form[s]'* but that this was only applied to individual cases
269 and depending on whether *'donor[s] required lots of paperwork and pre-project planning'*. The
270 tendency to overlook these ethical elements of data collection was linked to the urgency to initialise
271 funded projects. UR1 stated that *'in a lot of the projects we've worked on, there's often an urgent*
272 *deadline...so it's a trade-off between maintaining the scientific integrity of the data you collect and also*
273 *achieving your objectives'*. NGO2 indicated that they were developing ethical guideline policies to
274 apply to ongoing data collection practices while DA1 indicated that they had already established ethical
275 guidelines for their data collection procedures.

276 3.2.2 Quality and compatibility of secondary data

277 The perceived quality of data determined DRM researchers' willingness to use the data. NGO3
278 mentioned the low quality of *some* government data, citing its structure, depth, and lack of quality
279 control. UR2 identified larger (and international) NGOs as likely to have better quality data adding that
280 the choice to use NGO data (or not) therefore depended on whether users trusted the sources and
281 methodologies used to generate the data. UR2 also pointed out the absence of metadata on ownership
282 of data: *'To be honest I don't know who collects the data'*. According to DA1 (International donor),
283 data validation for quality control required information of data sources. However, as indicated by
284 NGO5, some institutions were likely to be excluded from acknowledgement for generation of primary
285 data, especially when the data was collected through a partnership. When working with universities,
286 NGO5 noted that *'The universities want to take a lot of the credit. So we are battling that. We want to
287 get acknowledged for the work that we're doing so we're always trying to get credit for what we have
288 done'*.

289 Quality of data was also influenced by the spatial and temporal compatibility of secondary data.
290 According to UR2, spatial incompatibility emerged when dealing with national level data which was
291 mostly available from government agencies and international NGOs. UR2 further added that secondary
292 data on DRM at the community level was scarce or unavailable. The spatial incompatibility of
293 secondary data led to researchers focusing on community level DRM often having to generate primary
294 data. One of the reasons cited by UR2 for the absence of community level secondary data was the lack
295 of digitisation of existing community level datasets and a lack of awareness about existing community
296 level secondary datasets. Additionally, UR2 indicated that researchers collecting community level
297 primary data rarely shared this data with the communities, which reduced the likelihood of researchers
298 accessing secondary data through communities. NGO3 and UR1 highlighted temporal incompatibility
299 of data as a limitation, which emerged when data were either too old or released too late to be useful.

300 3.2.3 Importance of partnerships for enhancing secondary data-based DRM research

301 Overall, greater collaboration in research was perceived by interviewees as a reflection of their ethos
302 and a contribution to their institutional goals. NGO1 noted that they were striving to *'be a knowledge
303 broker...[by ensuring] that information...[is] easily and freely available'*. NGO2 explained that they
304 believed that *'the data collected has to feed back into the broader national and international system.
305 It's not for us to use, it's to share'*. NGO3 and URI noted that collaboration between actors in use of
306 secondary data analysis was necessary, with URI highlighting the need for *'greater participation or
307 collaboration between the state and NGOs'*.

308 When asked about ways to overcome the challenges in use of secondary DRM data to inform DRM
309 research, suggestions included: *'[Data] portals and clearing houses to consolidate information'*

310 (NGO1); and a *'national level programme where data, in all forms, are collected and that there is a*
311 *process for managing the data to ensure that it is of a certain quality or in the formats that you want it*
312 *to be in'* (UR1). UR2 recommended the development of a *'data hub'* that would enable the storage of
313 data *'in a place that is easily accessible to the public or a researcher'*.

314 **4 Discussion**

315 One of the key goals of research partnerships is knowledge co-creation (Young & Freytag, 2020).
316 Existing work has already raised a number of challenges for equitable and effective NGO-Researcher
317 partnerships, e.g. power dynamics between NGOs and academic institutions (Buchy & Ahmed, 2007),
318 ethics concerns relating to the re-use of data (McDermott et al., 2019) and the ability of these initiatives
319 to achieve shared and locally relevant objectives (Sellers, 2017). However, Sellers (2017) explored
320 NGO-Researcher partnerships from the vantage point of primary data collection. Here we consider such
321 partnerships in relation to the use of secondary data. Although the re-use of data more generally has
322 been extensively discussed in existing research (Bishop, 2007; Hammersley, 2010), we investigate the
323 potential use of secondary data specifically held or generated by NGOs to support disaster management.

324 Our results from the scoping review and key informant interviews indicate that while academic
325 researchers use secondary data held or produced by NGOs and perceive these data as potentially useful
326 for informing DRM, evidence of the use of such data in academic literature is limited to informing
327 contexts as opposed to explanatory research. NGOs and academic institutions also encounter various
328 challenges in storing and analysing secondary data. The following sections will explore why this is so
329 and discuss how NGO-Researcher partnerships can be used to advance the use of secondary data
330 generated by NGOs to inform DRM research.

331 **4.1 Nature of NGO-Researcher partnerships based on secondary data**

332 The findings demonstrate the presence of hierarchies of secondary data in DRM research based on the
333 type of data (qualitative or quantitative) and perceptions of the quality of data. The NGOs from which
334 secondary data were obtained in the scoping review articles included a range of different organisations,
335 ranging from international to national. The relatively higher frequency of studies using data collected
336 by the IFRC and its national societies indicates their unique role in generation of data, but also the
337 ability of these NGO platforms (e.g. the IFRC's Vulnerability and Capacity Assessment repository) to
338 be reached by different research institutions. Data collected by other well-known international NGOs,
339 including Oxfam and Habitat for Humanity, were also used in multiple studies. Quality of data is
340 determined by the methodological rigor, ethical guidelines followed during data collection, data's
341 spatial and temporal compatibility and the data analysis and storage tools used. NGO capacity to meet
342 these data quality standards depends on the size of the organisation (Sledge and Thomas, 2019).

343 Secondary data that are perceived as questionable e.g. lacking sound methodological rigour or stored in
344 non-online formats, are avoided by researchers. This favours the use of secondary data from larger and
345 international NGOs such as IFRC, which are likely to have established ethical guidelines for primary
346 data collection and be better resourced to support data analysis and storage.

347 The presence of data hierarchies suggests that researchers are likely to develop research partnerships
348 with NGOs that they perceive as having higher credibility and quality. These NGOs are usually likely
349 to be larger international NGOs, which means that smaller and local NGOs are less likely to be part of
350 NGO-Researcher partnerships. In the backdrop of a shifting approach to international development that
351 is driven by the desire for research-informed development (Gooding et al., 2018), this bias creates a
352 negative feedback which affects smaller NGOs who experience higher competition for funding
353 resources and are likely to exhibit capacity gaps (Sewordor et al., 2018). For example, NGOs that have
354 fewer research outputs are less likely to acquire funding from certain types of donors and are also likely
355 to have research capacity gaps. These data hierarchies correspond to knowledge hierarchies that exist
356 within international development. Knowledge by NGOs and researchers perceived as local e.g.
357 community level or knowledge from the Global South is less likely to be considered credible and
358 therefore treated as lesser evidence (Newman et al., 2019). These hierarchies are created and sustained
359 by power inequalities between researchers and institutions engaged in collaborative research (Landau,
360 2012; Zingerli, 2010).

361 Addressing the bias that generates these hierarchies is particularly important for the multi-stakeholder
362 landscape of DRM in the Caribbean (Cooper & Cooper, 2015). Knowledge management has been
363 highlighted as a critical tool for enabling the knowledge generated Research based on secondary data
364 can contribute towards knowledge management through re-using existing knowledge to advance DRM
365 in the region (McNaughton & Rao, 2017). Knowledge sharing makes disaster management more
366 effective through standardisation of knowledge for a regional approach to disaster management in the
367 Caribbean. This can further contribute towards reducing the costs of disasters by recognising and
368 leveraging existing knowledge on disasters to generate lessons and insights about future disasters and
369 DRM responses.

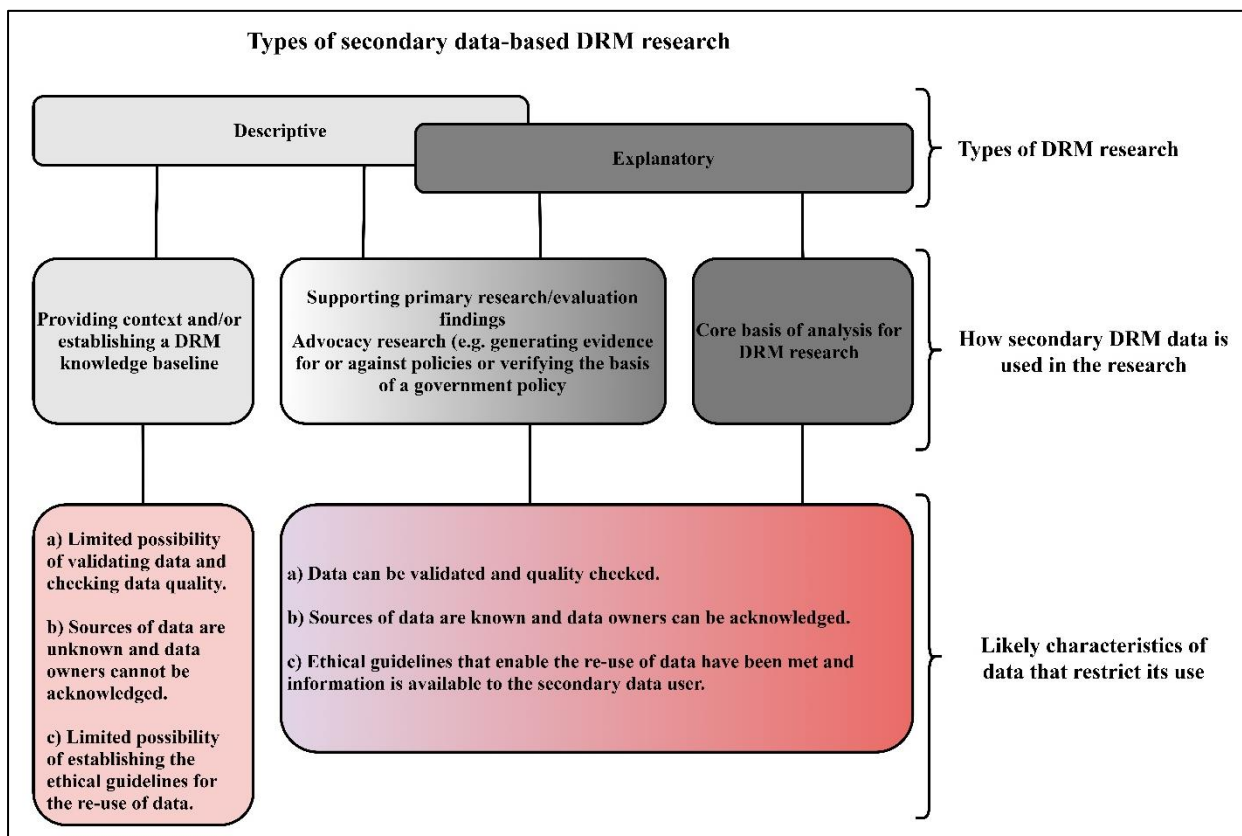
370 **4.2 Expanding the application of secondary data in DRM research**

371 The results from this study provide insights into the type of secondary data-based DRM research and
372 the level of analyses that is conducted in the Caribbean. Use of secondary data can range from being
373 descriptive to taking an explanatory approach (Figure 4). Descriptive DRM research involves the use
374 of secondary data to provide context or establish a knowledge baseline (Irwin & Winterton, 2011),
375 which requires little analytical rigour. Facts can be presented without necessarily acknowledging the
376 source of data. The descriptive nature of the research means that there is limited engagement with the

377 process of data generation; that is, researchers conduct minimal data quality and validation checks.
 378 Explanatory DRM research uses secondary data as a core basis for analysis, where new research
 379 questions are applied to the secondary data and new themes emerge (Corti & Thompson, 2006).
 380 Concerns relating to the likelihood of misinterpretation of data and fulfilment of ethical guidelines for
 381 re-use are higher for this type of research (Sherif, 2018) and hence DRM researchers intending to use
 382 secondary data validate the quality of data and recognise the source of secondary data.

383

384



385 Figure 4: Types of secondary data-based DRM research

386

387 The scoping study and interviews indicate a higher preference for qualitative secondary data by
 388 researchers in the region and the limited application of analytical rigour in these analyses. Most
 389 secondary data-based DRM research is descriptive. Ensuring that existing secondary data are used to
 390 support explanatory research requires that the quality and ethical guidelines of data are met and made
 391 available to researchers. However, researchers also need to be sensitized on the potential use of these
 392 data, especially as government and NGOs in the region continue to make advancements towards a
 393 common framework for knowledge management which include development of databases to store data
 394 on DRM (Hori et al., 2020).

395 **4.3 Creating and strengthening secondary analysis-based NGO-Researcher** 396 **partnerships**

397 The role of NGOs in global development is changing. Their role in development research is growing,
398 through encouragement by funders to participate in the generation and application of knowledge
399 (Delisle et al., 2005). Data generated by NGOs are now becoming more publicly available (Church,
400 2017). For example, development interventions funded by major donors like USAID and World Bank
401 are required to make data available to the public (Linders, 2013). The findings of this research indicate
402 that a desire for open data has spread amongst actors in the Caribbean region with increasing willingness
403 amongst NGOs to make their data available to support DRM research. This research indicates the
404 presence of informal and unequitable NGO-Researcher partnerships which are beset by challenges e.g.
405 those linked to the generation and sharing of secondary data and lack of proper acknowledgement of
406 NGOs' contribution towards research based on secondary data. Equitable NGO-Researcher
407 partnerships, which ensure that NGOs benefit equally from DRM research, are therefore necessary.

408 For NGO-Researcher partnerships for DRM research based on secondary data, an entry point would be
409 addressing existing capacity gaps within NGOs that support DRM in hazard prone regions such as the
410 Caribbean. This involves improving the capacity of NGOs to generate, analyse and store secondary
411 data, for example through strengthening NGOs' capacity to design robust data generation approaches
412 to improve data quality. NGO-Researcher partnerships that are based on secondary data should respect
413 the knowledge of NGOs, be driven by the desire to co-create knowledge (e.g. through setting shared
414 research agendas) and support learning by NGOs that produce the data (Fransman, 2019). This means
415 that NGO-Researcher partnerships in DRM research should not be viewed as an end goal, but as a
416 process, i.e. enabling societies to manage disasters in a more informed and effective way.

417 One option suggested by NGO1 (CANARI), UR1 and UR2 (both from the University of West Indies)
418 is the creation of central data repositories where DRM data from different levels can be deposited all
419 DRM actors in the Caribbean region and which researchers can use as a starting point when looking for
420 appropriate datasets. This would require the development of processes for data validation and quality
421 control and would offer equal opportunities for smaller NGOs to build their capacities and enable them
422 to engage in NGO-Researcher partnerships. This is especially important for Community Based
423 Organisations (CBOs) in the Caribbean which are usually overlooked during DRM planning (Collodi
424 et al., 2021). A repository with a framework for data access, sharing and use would also have clear
425 guidelines on application of ethical principles in re-use of data and proper acknowledgement of NGOs
426 roles in data generation and would contribute towards enabling equitable NGO-Researcher partnerships.

427 Facilitating and strengthening these NGO-Researcher partnerships requires that a diverse range of
428 stakeholders, including academic institutions, NGOs and governments representing different countries

429 and regions. Collaboratory approaches can be used to accelerate this process. Collaboratory models
430 leverage information technology to support collaborative research which is ‘more transnational and
431 participatory ...[and] allows multiple stakeholders to work together to solve problems that require
432 innovative solutions’ (Allen-Meares et al., 2005, p.29). Such collaboration systems and platforms
433 should be sensitive to the needs of different types of researchers and NGOs (Camacho, 2011). This will
434 reduce the risk of NGO-Researcher partnerships overlooking data from smaller and local NGOs due to
435 the perceived lower hierarchy placed on knowledge generated by these organisations.

436 **5 Conclusions**

437 DRM research led by academic institutions is important in supporting DRM practices in hazard prone
438 regions like the Caribbean. This paper set out to understand the value of secondary data collected by
439 NGOs in DRM research in the Caribbean. Data were collected through a scoping review of academic
440 DRM research conducted in the region to understand the extent to which secondary data have been used
441 to inform this research and through interviews with representatives from NGOs and academic
442 institutions in the Caribbean region. Use of secondary data has been mainly for descriptive purposes
443 e.g. in providing context to other research, with limited use in explanatory research. The interviews
444 indicated NGO and researcher willingness to develop research partnerships based on secondary data.
445 However, challenges relating to sharing of data, such as NGOs’ limited data storage and analysis
446 capacities, were identified. Large international NGOs were identified as more advantaged in addressing
447 these capacity challenges, which therefore increases the likelihood of re-use of their data. Existing
448 NGO-Researcher partnerships, especially those involving smaller NGOs, were likely to be
449 characterised by data extraction and were hence inequitable. This paper suggests that strengthening
450 NGO-Researcher partnerships is critical in enabling greater use of secondary data in DRM research but
451 requires increased capacity of NGOs engaged in DRM, especially those in the global South to generate,
452 store, analyse and share good quality data with academic researchers intending to re-use these data. It
453 also highlights the opportunities that a collaboratory model to DRM research offers, through
454 participatory and transnational collaborative research and practice.

455 Disaster management is complex (Asghar et al., 2006). It involves a variety of actors, all of whom must
456 coordinate to enable efficiency in disaster management (Twigg & Steiner, 2002). Understanding
457 disasters and ways to manage them requires interdisciplinary knowledge (Trim, 2004). This is
458 particularly important for Caribbean DRM which can benefit from DRM research based on secondary
459 data through knowledge sharing across locations which would in turn strengthen regional collaboration
460 on DRM. Partnerships that link research evidence to policy and practice in the region accelerate this
461 process. This research has found that NGO data on disaster management in the Caribbean is underused,
462 meaning that the benefits for DRM from wider data sharing are not currently being realised.

463 The findings of this research necessitate a greater emphasis on Caribbean NGO capacities to generate,
464 store and share DRM data with their peers and researchers. The multi-stakeholder Caribbean landscape
465 could benefit from more efficient approaches to knowledge management, which would reduce the costs
466 of disasters and DRM responses. As this study has demonstrated, the application of secondary data that
467 is generated by NGOs can potentially enable the re-use of knowledge to advance DRM research.
468 However, this requires that equitable partnerships between academic researchers and NGOs are built.
469 These should particularly target smaller and local NGOs which would otherwise be overlooked due to
470 the perceived low level these NGOs occupy in the hierarchy of knowledge. Their engagement in NGO-
471 Researcher partnerships is also likely to be inequitable. Capacity development for these NGOs is also
472 essential, which will enable them to generate, analyse, store and share DRM data that can form the basis
473 for further DRM research based on secondary data. Further research on the use of collaboratory models
474 in DRM is necessary, especially with respect to how these models can build on existing DRM regional
475 collaboration platforms such as those that are present in the Caribbean region.

476 **Supplementary materials**

477 Supplementary material 1: Database search terms

478 Supplementary material 2: List of peer reviewed articles used in the scoping study

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