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What is the role of accounting in disaster recovery and relief? A literature review

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Abstract. This study explores the role of accounting system and its output on government's and donors' responses to disasters across the world. It discusses potential contribution and limitation of accounting in the disaster relief and recovery process. To do so, a literature review of 22 papers on accounting and disaster is performed. The review papers were search and gathered from reputable journals indexed in Scopus database. This study discovers that accounting can play a more extensive role, rather than dealing merely with financial loss calculation and budget preparation for disaster recovery and relief program. Accounting has a broader role and this extended role has not been sufficiently covered in several previous studies. The role of accounting in responding to disasters is beyond the calculative function and passive recording of events. Accounting can support the establishment of exceptional governance, facilitate dialogue and create mutual understanding between stakeholders through financial information. In addition, accounting can assist the projects monitoring and evaluation and its outputs (budget, unit cost calculation, and storage bookkeeping) can be used by researchers to understand what really happens and how society responses to disasters.

1. Introduction

Natural disasters have been occurring more frequently during the last decades and become common topic and discussion in major media channels. The disasters have also attracted attention of researchers from different fields and encouraged multidisciplinary research collaborations. Many efforts have been made to mitigate the impact of the disasters on the society through research, seminars, workshops and even simulations. Relevant experts and government entities have been working together to formulate the best disaster preparedness and responses procedures. Both parties are concerned with several dimensions of disaster and sectors including health, shelters, city mapping, food reserve and many more.

One of important aspects in disaster preparedness and responses is accounting. Accounting might be interpreted as reporting and auditing and most probably link to the financial responsibility to the donors and other organisations which provide aids. Accounting has been greatly misunderstood and misinterpreted as bookkeeping and financial responsibility, rather than a system, tool or technology. The function of accounting seems to be narrowed into reporting and responsibility although it has potential to contribute beyond those functions. Due to this misunderstanding and the complicated procedures within accounting, thus there has been a limited attention in the role of accounting and its development in disaster discourse.

In responding to disasters, accounting procedures perhaps become the last thing that government takes into consideration. In most cases, accounting plays a role in reporting the use of resources to the donors and upper-level government entities. However, recent studies have revealed a more active function of accounting in disaster setting and discourse [1]. There have been several studies on the role of accounting and its products in disaster. For instance, Sargiacomo [2] investigates the function of accounting in 2009 earthquake in Abruzzo, Italy and Walker [3] explores how the victim of drought in the 1930s in the US assist the government effort in establishing a successful recovery program. To fill

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the gap in the existing literature, this study aims to explore the role of accounting and its evidence in the response to disasters around the globe. The results of this study can be used to formulate policy and establish a more capable accounting system that helps the government and other key actors in implementing their recovery and relief efforts. Besides, this type of study can potentially build a basis for future theory building and for future comparative research related to the response to more recent natural disasters [1].

As this study attempts to reveal the broadened role of accounting in disaster responses, previous studies on the role of accounting in response to disaster is reviewed and discussed. The results of this study are expected to create a stepping-stone in raising governments and other stakeholders' attention towards the broadened role of accounting in responding to natural disasters.

2. Data and Methods

This study uses literature review approach. A literature review is a systematic review of previous relevant studies to identify, evaluate and interpret the results and finding a research gap [5]. The aims of a literature review are to summarize the result of relevant former studies on the specific topic and to build conceptual content for theory development [6]. To ensure the quality of reviewed papers and ease the process of searching the papers, this study reviews only scientific papers that have been published in international reputable journals indexed in Scopus.

The reviewed papers were gathered from the application of two searching methods, namely database search and snowballing techniques. Firstly, the papers were collected from Scopus database by using keywords and filter features. The keywords used are 'accounting' and 'disaster' and the period of paper search was set up between 1990 and 2018. Based on this method, 63 papers were obtained. However, there were only 14 papers relevant to the research question. Later on, from the 14 papers, the second step was carried through snowballing techniques. The snowballing technique is a literature searching technique that uses the reference list or the citations of the paper that previously has been documented in the database search method [7]. In this second step, 8 relevant papers have been found and thus, the final number of the reviewed papers is 22 papers. Following are the list of the reviewed papers:

Table 1. List of reviewed papers

No	Authors	Title	Source title (year)
1	Paik G.H., Lee B., & Krumwiede K.R.	Corporate social responsibility performance and outsourcing: The case of the Bangladesh tragedy	Journal of International Accounting Research (2017)
2	Vosslamber R.	After the earth moved: Accounting and accountability for earthquake relief and recovery in early twentieth-century New Zealand	Accounting History (20150
3	Sargiacomo M.	Earthquakes, exceptional government and extraordinary accounting	Accounting, Organizations and Society (2015)
4	Atkins J., Atkins B.C., Thomson I., & Maroun W.	"Good" news from nowhere: Imagining utopian sustainable accounting	Accounting, Auditing and Accountability Journal (2015)
5	Sargiacomo M., Ianni L., & Everett J.	Accounting for suffering: Calculative practices in the field of disaster relief	Critical Perspectives on Accounting (20140
6	Lai A., Leoni G., Stacchezzini R.	The socializing effects of accounting in flood recovery	Critical Perspectives on Accounting (2014)
7	Cooper C., & Coulson A.B.	Accounting activism and Bourdieu's 'collective intellectual' - Reflections on the ICL Case	Critical Perspectives on Accounting (2014)

8	Walker S.P.	Drought, resettlement and accounting	Critical Perspectives on Accounting (2014)
9	Miley F., & Read A.	After the quake: The complex dance of local government, national government and accounting	Accounting History (2013)
10	Hsu Y.-S., Liu C.Z., Yang Y.-J., & Chou Y.-Y.	Implications of the British petroleum oil spill disaster for its industry peers - evidence from the market reaction and earnings quality	Asia-Pacific Journal of Accounting and Economics (2013)
11	Anderson S.E., Jones L.C., & Reed T.N.	Insurance fraud: Losses, liabilities, and September 11	Issues in Accounting Education (2012)
12	Cooper C., Coulson A., & Taylor P.	Accounting for human rights: Doxic health and safety practices - The accounting lesson from ICL	Critical Perspectives on Accounting (2011)
13	Matilal S., & Höpfl H.	Accounting for the Bhopal disaster: Footnotes and photographs	Accounting, Auditing and Accountability Journal (2009)
14	Philip O'Regan	'A dense mass of petty accountability': Accounting in the service of cultural imperialism during the Irish Famine, 1846–1847	Accounting, Organizations and Society (2010)
15	Bisman	Budgeting for famine in Tudor England, 1527–1528: social and policy perspectives	Accounting History Review (2012)
16	HÓgartaigh, C Ó, HÓgartaigh M Ó, & Tyson, T	'Irish property should pay for Irish poverty': accounting for the poor in pre-famine Ireland	Accounting History Review (2012)
17	Baker, C R	Break downs of accountability in the face of natural disasters: The case of Hurricane Katrina	Critical Perspectives on Accounting (2014)
18	Everett, J, & Friesen C	Humanitarian accountability and performance in the Théâtre de l'Absurde	Critical Perspectives on Accounting (2014)
19	Sciulli, N	Weathering the storm: Accountability implications for flood relief and recovery from a local government perspective	Financial Acc & Man. 2017;1–15. (2018)
20	Perkiss, S, & Moerman L	Hurricane Katrina: Exploring justice and fairness as a sociology of common good(s)	Critical Perspectives on Accounting (2017)
21	Taylor, D, Tharapos, M & Sidaway, S	Downward accountability for a natural disaster recovery effort: evidence and issues from Australia's Black Saturday	Critical Perspectives on Accounting (2014)
22	Bebbington, J & Harrison, J	Global Climate Change Responsiveness in the USA: An Estimation of Population Coverage and Implications for Environmental Accountants	Social and Environmental Accountability Journal (2017)

3. Results and Discussions

Based on prior research that explores the role of accounting in disaster response, relief and recovery program, this study finds that the role accounting can be expanded and is not merely dealt with

financial loss calculation and budget for disaster recovery and relief program. Accounting has a broader role and this extended role has been uncovered in several previous studies. The results of literature review can be classified into two main findings, namely the role of accounting in the response to disasters and the limitation of accounting in the context of disaster.

3.1. The role of accounting in response to disasters

Accounting is not a merely a technique and a system of calculating, reporting, and controlling the usage of financial resources, but also a social activity that mirrors and constructs the social organizations that shape the response of a society to a situation [1]. In fact, researchers and experts have acknowledged since 1980s that accounting practice is shaped by the situation and the context of setting where it is operated [10]. Thus, the review of papers in this study attempted to capture the role of accounting in the emergency situation and its contribution to the society responses. The broadened role of accounting has been documented by several papers and thus, it can be classified into three functions.

Firstly, it is discovered that the role of accounting in responding to disasters is more than calculative function and inactive recording of events [1]. For example, Sargiacomo [2] investigated the contribution of accounting in aftermath of the earthquake in Abruzzo, Italy that occurred in 2009. This study unveiled how accounting classification, incorporation with scientific classification (i.e. the Mercalli scale), become the crucial part of the establishment of exceptional governance. In this case, accounting classification technique is used by the local health departments to classify the affected areas based on the resulted damages and to determine how much money should be given for the disaster relief funding by the federal government. This involves distinguishing areas and people from those significantly affected and to those insignificantly affected at all and finally attaching financial and costing measures based on the level of damage severity [2]. In an emergency response situation where an extraordinary government is established, accounting provides a tool for calculating the cost of earthquake as well for justification of financial provision for the victims.

Secondly, accounting has the ability to facilitate dialogue and create mutual understanding between stakeholders. This can be achieved through financial report and calculation for damage reimbursement program. The study of Lai, Leoni, & Stracchezzini [8] has demonstrated this situation. They studied accounting procedures in determining and calculating financial loss and reimbursement for the victims of Italian flood in November 2010. In this case, accounting was utilized in the recovery phase for calculating the consequential damages bore by the individual and organizations as well as for the collection of funds from the Italian central government and other donators [8]. This mission required all the key actors i.e. the central government, municipal officers, victims and sponsors to do their role in their recovery process. The dialogue between these key actors was fostered by accounting data; create mutual understanding, corporation and trust that support the accountability process [Lai, Leoni, & Stracchezzini]. The victims and other actors who are responsible for the recovery process have involved in intensive discussion and coordination to accelerate the reimbursement for the incurred damages. Accounting is able to unveil the people, business and local government financial needs and condition after the disaster, and thus, it is welcomed. Indeed, they need to collaborate and support each other to ease the reimbursement process.

Thirdly, accounting can become a key facilitating technology in monitoring and evaluating recovery projects. The output of accounting system provides a rich data that can be used to trace and evaluate the need of victims [3]. Accounting procedures make visible the recovery process, the resulted damage, the resources' need and the outcomes [8]. Moreover, the accounting data and documents can provide important information to understand beneficiaries' condition and monitor the progress as well as the effectiveness of a recovery project. Walker [3] studied a resettlement project namely Red River Valley Farms Project which aimed to relocate families affected by the severe drought disaster occurred in North Dakota back in 1930s. In this study, Walker explored how accounting records maintained by the beneficiaries used by the government and expert to monitor the successfulness of the project, to measure the progress of its beneficiaries and identify the most needed assistance. The accounting records were called a Farm and Home Plan and a Farm Family Record Book. The former is a financial assessment of the farmstead status and a budget of business and domestic operations, whereas the latter is a record of all transaction, production, inventory, assets,

liabilities, and cash flows relating to both farm and home activities. These records were maintained by the farmers and has become the basis for the resettlement project establishment and evaluation [3].

Finally, the products of accounting system such as budget, unit cost calculation, and storage bookkeeping can be used by researchers to understand what really happens and how society responses to disasters. It gives an insight on historical events that can be a lesson learnt for the next generation especially in responding to disasters. Most of the reviewed papers collect the data by using documentation analysis approach where accounting records are the main ingredient. For instance, Walker [3] analysed the accounting records produced by farmers and other supporting project reports to uncover the role of accounting as a key facilitating technology in the drought recovery project. Meanwhile, Bisman [9] investigated the England government policy on the East Anglian Famine of 1527-1528 by using a specific budget document prepared by the Kingdom in the 16th century to assist decision making and resource management in the period of severe scarcity of food. Taken together, the available accounting records so far can be used, accompanied with other documents, to obtain a complex picture of disaster recovery process and situation faced by the government.

3.2. The limitation of accounting

Although accounting has an ability to facilitate our understanding on disaster recovery phase, it has some limitations. Firstly, accounting may potentially be used for political purposes. Accounting standards and regulations as the basis for accounting practices and reports are not free from political interest. The standards can be changed substantially to align with the politicians' and government interest. These situations can be found in the New Zealand case where the government change accounting practice at all levels of government [11]. These changes have influenced the scope of financial disclosures of financial realities and thus, change the quantity of information of the accounting records. For example is a change from cash basis to accrual basis accounting. The accrual basis might provide more detailed information about the expenditures but it is prone to manipulation.

Secondly, accounting artifacts cannot be used independently without any support from other information and documents. Budget and financial reports mostly consist of numbers and researchers need other source of information to gain the whole story [12]. In fact, the use of accounting information as the single source of information to understand disaster responses and recovery can be problematic and misleading. In a study conducted by Matilal & Höpfl [13], it is found that the use of both statements of account and the photographic image of Bhopal gas exposition tragedy can capture the tragic situation and consequences of the disaster more comprehensively.

4. Conclusions

This study concludes that accounting has a role beyond a mere passive recording of events. In the context of disasters, accounting is able to provide not only a calculative mechanism for reporting, but also facilitates communication among the stakeholders, monitors and evaluates disaster recovery projects. Apart from that, accounting within the context of disaster also contributes into the development of research in accounting and disaster management. However, some drawbacks are noted namely it can be politically constructed and it needs other supporting information to obtain the complex picture of the situation. Finally, given these important roles, accounting is supposed to receive more attention and concern by government and donators. This includes proper accounting information storage and security especially for emergency situation, accounting standards and procedures for disaster recovery phase and projects and the involvement of accountants or accounting experts in disaster recovery activities.

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