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Involvement in emergency supply chain for disaster management: a cognitive dissonance perspective

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An integrated process, interlinked operation and interoperable communication network amongst operating agencies are critical for developing an effective *disaster management supply chain*. The traditional managerial problems observed across disaster management operations are: non-cooperation among members, disrupted chain of commands, misuse of relief items, lack of information sharing, mistrust and lack of coordination. This study aims to understand the issues affiliated with negative attitude towards disaster management operations using theory of cognitive dissonance. A qualitative investigation was undertaken across 64 districts in Bangladesh. Five constructs were examined for their influences on attitude and behavioural intention of members participating in government emergency supply chain for disaster management. The results indicate that administrative conflict, political biasness and professional growth have significant effects on attitude. Impact of insecurity is non-significant on attitude. This research offers substantial theoretical contribution to the cognitive dissonance theory in the context of disaster management supply chain.

Keywords: emergency supply chain; disaster management; administrative conflict; organisational behaviour; cognitive dissonance theory; attitude

1. Introduction

Disaster is either a manmade or natural event, which causes sudden and uncontrollable widespread damage across a community (Stephenson 2005; Whybark et al. 2010). Natural disasters including cyclones, tornadoes, earthquakes, regular and flash floods, snowstorms, stampedes, avalanches and fire may occur anywhere, at any time. These cause serious losses to the community, society and economy (Xu and Beamon 2006). Typically, during any disaster situation, residents need extraordinary support and relief, as the losses exceed the ability of the affected community to meet and fulfil its demands using regular resources (Xu and Beamon 2006). Disaster management includes activities essential for forecasting demand, assessing needs, procuring, storing and managing inventory and logistics and distributing relief to minimise losses before, during and after any disaster (Balcik and Beamon 2008).

This study is focused on understanding the performance of participating members in an emergency supply chain or humanitarian supply chain management. Such identification has potential merit, as the supply chain management for disaster under humanitarian grounds differs significantly from regular or commercial supply chain management (Beamon 2004; Charles, Lauras, and Tomasini 2009). Therefore, all aspects of organisational conflicts, administrative issues, employee attitude and performance and interoperability explained within this study are related to the operation of supply chain for disaster management under humanitarian grounds.

Several studies (e.g. Cozzolino 2012; Balcik and Beamon 2008; Xu and Beamon 2006) analysing supply chain network for emergency disaster management acknowledge that in any disaster, government traditionally deploys many organisations. However, inter-organisational integration is a serious challenge in disaster management. In developing countries, various socio-economic and political issues, particularly, corruption, non-accountability, lack of transparency and political biasness, substantially hinder the success of disaster management efforts. Some of the problems observed across disaster management operations through established supply chain network include: non-cooperation among employees or volunteers, disrupted chain of commands among versatile groups, misuse of relief items for corruption, lack of information sharing, mistrust, lack of coordination among members and inappropriate proportion of responsibility and assigned authority (Diallo et al. 2017). The definition of distressed people in natural disasters is generally not

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well structured and predefined in developing countries (Balcik et al. 2010; Charles, Lauras, and Tomasini 2009). It should be clearly distinguished from regular poverty management under humanitarian grounds. An effective emergency supply chain should focus on the actual need assessment, which essentially includes dynamic, swift and coordinated field assessment. However, it is evident from some investigations that in developing countries, at different authority levels, this assessed demand derived from the source is randomly reduced anticipating exaggeration of demand (bullwhip). This reduction is not based on any scientific scale. Defining roles and responsibilities and coordination is a serious problem across emergency supply chain management for developing countries (Beamon 2004). Considering the aforementioned organisational problems, this study is focused on investigating emergency supply chain management in developing countries.

Assisting distressed people with food and other life-saving items requires positive commitment, alongside professional responsibility from volunteers and employees of different participating organisations (Collins and Hoyt 1972). They generally have high integrity for such work, as they closely relate to the emotional aspect of such assistance (Cozzolino 2012). However, with issues of mismanagement, corruption, professional dissatisfaction, lack of transparency, administrative conflicts, etc., members of these supply networks tend to develop negative attitude towards their assigned tasks (Cozzolino 2012). Organisational behaviour researchers (Reich 2006; Rodriguez et al. 2006; Shareef, Dwivedi, and Kumar 2016) have conducted many qualitative and quantitative studies on the attitude and behaviour of employees towards pursuing organisational goal. They have acknowledged that the alignment of attitude and behaviour is crucial for utilising the full potential and achieving plausible targets. Misalignment and conflicts between attitude and behaviour of people participating in disaster operations can result in employees not pursuing organisational goals wholeheartedly, and experiencing dissatisfaction and demotivation (Collins and Hoyt 1972; Rusbult and Van Lange 2003). Consistency in attitude and behaviour is a vulnerable issue in organisational life for promoting continuous workflow.

Attitude is a predisposition of beliefs, ideas and feelings about anything, either positive or negative (Deci 1975; Shareef, Dwivedi, and Kumar 2016). People gain and form attitudes from learning, experience and social factors (Deci and Ryan 1985). It is also formed from psychological emotion and affective feelings (Chen and Risen 2010; Deci and Ryan 1985). Behavioural intention is our subjective willingness to pursue or conduct any effort or incident (Ajzen 1991). Theory of reasoned action (TRA) (Fishbein and Ajzen 1975) and theory of planned behaviour (TPB) (Ajzen 1991) have analysed human behaviour and attitude to conclude that attitude has a considerable impact on behavioural intention. Negative feelings, beliefs or impressions which form attitude can streamline non-occurrence of any behaviour.

Since natural disasters happen suddenly, the pre-, during and post-disaster management essentially needs well-organised and structured coordination. Communication among different groups and organisational members to control losses, minimise sudden disruptions and achieve targeted goals is also important (Bui et al. 2000; McLachlin and Larson 2011). Scholarly studies on disaster management (McLachlin and Larson 2011; Oloruntoba and Gray 2006) clearly articulate that intrinsic willingness and disciplined behaviour of all members involved in disaster management are the key success factors of any emergency operation. On the other hand, if there is any inconsistency between attitude and behaviour amongst members of disaster operations, even a well-structured emergency supply chain might not achieve its final goal. In line with the preceding discussion, this study proposes to investigate the following research questions: (1) What are the antecedents of negative attitude formation amongst employees participating in an emergency supply chain? and (2) What is the influence of negative attitude on employees' intention to participate in emergency supply chain management?

Researchers studying disaster management (Beamon and Balcik 2008; Stephenson 2005) and supply chain (Wang and Zhang 2016; Zheng et al. 2017) have suggested many potential problems in emergency supply chain for humanitarian assistance. Some of these problems are: mapping the existing emergency supply chain, demand forecasting and need assessment, procurement, inventory management and stocking, logistics management, relief distribution, information management and interoperability. Researchers (Cozzolino 2012; Balcik et al. 2010) in this context also postulate that due to unavailability of an established organisational structure, often members with prior experience of disaster management operations form negative attitude towards the success of the next operation. They also acknowledge that negative attitude towards the accomplishment of objectives reflects intrinsic demotivation in their performance (Stock 1997; Surana et al. 2005). However, no study so far has examined human behaviour in emergency supply chain of disaster management from an organisational behaviour perspective. This is a potential gap in the existing literature on disaster management supply chain for humanitarian assistance. Nevertheless, identifying epistemological and ontological paradigms of misalignment between attitude and behaviour has an enormous importance in developing an effective structure of emergency supply chain for disaster management (Bui et al. 2000). This study is attempting to address and reveal issues of inter-organisational members, who typically are causing and forming negative attitudes towards their disaster operations. This generally causes conflict between their attitude and behavioural intention, leading to undermined performance. Therefore, the main objective of this study is to identify and empirically examine factors influencing negative

attitude formation of employees, and their intention to be involved in emergency disaster management operations. The factors included in this study are derived from the theory of cognitive dissonance. From this study, organisational theorists and emergency supply chain management practitioners can acquire insights on organisational conflicts arising from absence of interoperability in humanitarian supply chain management; this can negatively influence the performance of such operations.

Section 2 presents a discussion on relevant literature and current results from exploratory interviews as a basis for formulating appropriate hypotheses. It outlines a set of hypotheses along with supporting arguments and discussion. Section 3 then discusses various aspects of methodology, including data collection and survey scale. This is followed by section 4, which presents relevant statistics related to reliability and validity of the survey, alongside results from hypotheses testing. The discussion of results is presented in section 5, which also briefly discusses contributions to theory and implications to practice. Finally, key conclusions along with limitations and future research directions are presented in section 6.

2. Theoretical background and hypotheses' development

To explore the two aforementioned research questions, this section presents the theoretical basis for the undertaken research. The following subsection will briefly discuss exploratory qualitative interviews that were conducted to identify antecedents of negative attitude towards emergency supply chains. These together form the basis for hypotheses' development.

2.1 *Theoretical basis*

Inter/intra-organisational relations during emergencies often create attitudinal conflict amongst members of different participating organisations (Stock 1997; Surana et al. 2005). Since different organisational members work together during disasters to alleviate emergency risks, integration or homogeneity amongst organisational members is a potential issue. Success of any disaster management is highly congruent with the effectiveness of inter/intra-organisational integration. The technical, organisational, cultural, social and behavioural differences, combined with sudden managerial and administrative application of authority and responsibility, result in organisational members facing acute conflicts during disaster management (Stephenson 2005). On the other hand, communication gap, lack of transparency, absence of rules and regulations and broken chain of command cause conflicts in the government supply chain (Balcik et al. 2010).

Several studies have revealed that inter/intra-organisational members' cohesiveness is a potential organisational issue, and should be resolved in the light of organisational relations (de Charms 1968; Cordova and Lepper 1996; Emerson 1962; Stock 1997). Intra-organisational homogeneity and inter-organisational heterogeneity can lead to attitudinal conflict amongst members (Stephenson 2005). Also, due to the presence of a common steering body deployed by the national government, behavioural synchronisation is warranted (Shareef et al. 2011). Consequently, members of different organisations participating in disaster management experience inconsistency between their behaviour and attitude, which has substantial impact on their performance.

This phenomenon is well articulated and explained in cognitive dissonance theory by Festinger (1962). This psychological theory postulates that if people perceive attitude not being consistent with their behaviour, they feel uncomfortable. This theory reflects necessity of congruence between attitude and behaviour. The lack of comfort may increase dissatisfaction and undermine performance. Therefore, this theory has potential implication in organisational life. In an organisational life, members should develop congruent attitude aligned with the organisational objective, which should shape their intended and expected behaviour. According to this theory, humans try to remove any inconsistency and thus incompatible beliefs according to their importance. Based on our cognition or thinking process, if we have two or more conflicting motives, our behavioural contribution is seriously affected and hampered (Cordova and Lepper 1996; de Charms 1968). Therefore, streamlining motives or beliefs influencing attitude and behaviour is of utmost important to achieve full potential of human resources in organisational life. This is a challenging context, as without removing the inconsistency in antecedent beliefs, alignment between attitude and behaviour is difficult to achieve. Therefore, we utilise the implications from this theory to guide the investigation of the reasons for inconsistent beliefs and attitudes, which contradict with our expected or forced behaviour. Many studies (e.g. Cooper and Fazio 1984; Gagne, Yekovich, and Yekovich 1993; Nelson 2006) using cognitive dissonance theory suggest that it is important to address the malfunctioned beliefs forming dissatisfied attitude in organisational life to streamline employees towards expected behaviour.

Cognitive dissonance theory has two major components, attitude and behaviour. Attitude is dependent on several beliefs surrounding organisational life. The next subsection describes the exploratory (qualitative) aspect of this study that forms the basis for identifying antecedents of attitude, particularly for disaster management in Bangladesh.

2.2 *Exploratory interviews to identify antecedents of attitude*

In order to explore antecedents that may be relevant for negative attitude formation, this study undertook a qualitative investigation. The district relief and rehabilitation officers (DRRO) in 64 districts of Bangladesh were interviewed. The DRROs in Bangladesh were selected as the sample due to the following reasons:

(1) Due to global warming, Bangladesh is experiencing the most severe environmental changes, which cause frequent disasters.
(2) Bangladesh is a disaster-prone country and faces the challenges of managing natural disasters every year, particularly floods and cyclones. These disasters cause severe damage to property and shelter, cause loss of human and animal lives, bringing enormous sufferings to the poor people in the country.
(3) The Bangladesh Government has set up an excellent supply chain network for emergency disaster management on humanitarian grounds. From the cultural perspective, this country largely represents collectivist and high power distance attributes (Hofstede 1980). These issues offer significant potential in investigating intra- and inter-organisational performances (de Charms 1968; Emerson 1962; Stephenson 2005; Stock 1997). Therefore, investigating emergency supply chain management of Bangladesh Government can offer important insights for researchers and policy-makers.
(4) Different organisations with 50,000 volunteers are working under the cyclone preparedness programme (CPP) to assist disaster-affected people through emergency humanitarian supply chain.
(5) DRROs are the central and bridging authority to coordinate, communicate and manage all kinds of humanitarian assistance during, before and after disaster.

One of the authors of this study contacted a top official in Food ministry of Bangladesh and requested for an informal interview. The official then instructed all the DRROs to provide time for this study. The authors and three research assistants then went to designated locations specified by the respective DRROs, and conducted face-to-face interviews. Most of these locations were the district headquarters. The DRROs were primarily asked to describe and evaluate different member perceptions, motives, beliefs and impressions towards emergency supply chain of humanitarian assistance, focusing on management issues. They were particularly asked to identify the intra- and inter-organisational member attitudes towards disaster management works. Each interview lasted two hours. They described the complete supply chain of Bangladesh Government for disaster management and the generalised aspects of emergency-related management:

- Enhancing accuracy in assessment and estimation of damage or losses.
- Ensuring appropriate amount of relief availability among distressed people and communities at proper time and closest location.
- Fulfilling demands and requirements of distressed people and communities at the earliest possible time.
- Minimising inventory storage quantity and enhancing inventory speed with minimum lead time.
- Maintaining proper interoperable communication and coordination among stakeholders.
- Reducing cost of overall disaster management.
- Establishing permanent structure and policy to manage forward and reverse emergency supply chain network.

The respondents addressed and introduced several issues related to malfunctioning of management with multidimensional parameters and reasoning. They were also in agreement about the fact that members participating in humanitarian supply chain during disasters perform weakly, but are active externally. Given that their work experience, social factors and learning were very similar, the DRROs showcased many similarities in their answers. Their perceptions, identifications and appropriate evaluations had sufficient consistency in analysing existing emergency supply chain for humanitarian assistance. Keywords were identified in responses gathered for detecting problems of inefficiency and ineffectiveness of disaster management. This helped the researchers categorise responses into different groups and identify the constructs as independent reasons for developing attitudes.

To present the qualitative data obtained from 64 respondents, the information gathered was rearranged according to principles of matrix thinking. Researchers working on analysing interviews to reveal commonalities in responses have used this technique (Patton 1981). Several long answers were broken down into small pieces to identify common attributes. Literature on administrative and managerial conflicts amongst intra- and inter-organisational members in disaster management supply chain (Quarantelli 1988; Stephenson 2005; Wu et al. 2011; Zheng et al. 2017) offered additional

knowledge on development of reasonable constructs for shaping attitudes. The respondents' verbal inputs, once converted by matrix thinking into generalised independent constructs, had many similarities. Following this, the research identified five most common factors, namely – professional growth, administrative conflict, corruption, insecurity and political biasness, as issues leading to attitude formation by participating members. These factors are termed hereafter as the attitude formation constructs, and are explained in detail along with their associated hypotheses in remaining parts of this section.

2.3 *Hypotheses' development*

2.3.1 *Professional growth*

All the DRROs pointed out that a significant factor of demotivation in members, including themselves and volunteers working in the emergency supply chain of humanitarian assistance, is the lack of professional growth (PG). Under the ministry of disaster management and relief, all district-level employees like DRROs and below (for instance, Upazila project implementation officers (PIO) and volunteers) have limited scope for promotion in comparison to other government departments. Volunteers are sufficiently trained and play a key role before, during and after disasters in warning, assessing damage and distributing relief. However, they receive no direct honorarium. Although,they are recruited as volunteers, there is no motivational reward for them. Consequently, these members develop negative attitude towards the government emergency humanitarian supply chain. This hinders the development of satisfactory attitude (Rodriguez et al. 2006; Rusbult and Van Lange 2003). Studies related to organisational motivation (Collins and Hoyt 1972; Cordova and Lepper 1996) substantially acknowledge that employees are always eager about their scope for gradual professional advancement. If they recognise that they have limited opportunity for career advancement in their current organisational structure, employees intrinsically develop negative beliefs about the organisation. This predominantly contributes towards negative attitude formation about their current position in that organisation (Collins and Hoyt 1972; Cooper and Fazio 1984). Thus, this study proposes the following hypothesis:

H1: Perceived lack of professional growth (PG) in the supply chain has a significant influence on forming negative attitude towards disaster management for humanitarian assistance.

2.3.2 *Administrative conflict*

Majority of respondents interviewed during the exploratory phase outlined some important issues relevant to this aspect. These are:

(1) The DRRO office is not directly connected with Bangladesh meteorological department to get updates on forecasts for unexpected cyclones or tornadoes.
(2) Transportation facility under the DRRO office or PIU office is restricted, old and potentially unusable. Frequently, while distributing assistance, they seek assistance from district commissioner's office for transportation. It is a tragic scenario.
(3) Administrative conflict between district commissioner and the DRRO creates red tape delay. DRROs have expertise in estimation and distribution, and hold responsibility of overall relief management. On the other hand, local district commissioner has the authority to approve any demand, requirement and distribution.
(4) District commissioner also has the authority to govern employees under the office of DRRO. Authority and responsibility are not distributed proportionately.

DRRO, PIO and volunteers have competence in distribution management, and thus hold full responsibility. Authority is assigned to district commissioner and Upazila Nirbahi officer (UNO). Absence of appropriate organisational structure, authority and responsibility creates significant problems in emergency supply chain management of Bangladesh Government during disasters. While designing administrative structure, the special nature of this job for assessing, estimating, procuring and distributing relief before, during and after the disaster is not appropriately considered. Responsibility and authority have not been adequately balanced due to bureaucracy. These issues create administrative conflict among intra- and inter-organisational members. Studies on organisational employee satisfaction and issues related to conflict and attitudinal behaviour (Reich 2006) acknowledge that if authority and responsibility are not proportionately distributed, administrative conflicts can have detrimental effect on employees' attitude. Administrative conflict results in severe dissatisfaction among employees leading to negative attitude towards organisational goals (Risen and Chen 2010). Based on the aforementioned discussion and organisational behaviour studies, this study proposes the following hypothesis:

H2: Administrative conflict (AC) in supply chain has a significant influence on negative attitude formation towards disaster management for humanitarian assistance.

2.3.3 *Corruption*

Out of the 64 district representatives of disaster management, 53 DRROs firmly delineated that corruption is a major issue for participating members not to have positive motives towards disaster management emergency supply chain. They find that different sources of non-transparency and lack of accountability cause corruption in this humanitarian assistance programme, leading to severe contradiction with its implied mission. Excluding many evidences of direct stealing and misuse, they also indicated several incidents of forceful non-transparency leading to corruption, such as

(1) Scope of assistance and estimation process is not clearly identified. It is ambiguous in several areas, overlapping and non-transparent in guidelines for humanitarian assistance programme, 2012–2013.
(2) Speedboats or regular manual boats are important carriers in flood-affected areas, coastal belts and riversides. DRROs, TNOs and PIOs are required to visit these places frequently through waterborne carriers. However, there is no provision for maintenance cost of such waterborne carriers.
(3) The government does not supply or set aside budget for fuel in hired external boats to travel to flood-affected areas. It is managed from out of pocket expenses (hidden).

Like the above-mentioned issues, there is much expenditure that the authorities need to manage from hidden areas that leads to forceful corruption. This has become a common practice in emergency management in Bangladesh, which eventually leads to negative attitude among participating members. Studies in human psychology (Rusbult and Van Lange 2003; Stock 1997) affirm that corruption in organisational relations is a significant reason for human beings to form negative attitude towards the organisational goal. Organisational studies also reveal that implied non-transparency in organisational relations creates negative attitude towards any explicit mission. Thus, this study postulates:

H3: Corruption (CR) in supply chain has significant influence on negative attitude formation towards disaster management for humanitarian assistance.

2.3.4 *Insecurity*

Disaster management-related works have some significant and unique characteristics related to safety. People who participate in emergency supply chain for assisting distressed people undertake severe risk. Unlike other organisational functions in any supply chain, disaster management is emergency work that can be needed at anytime, even midnight; during natural calamities, members of the supply chain may be required to move to remote places to distribute relief. In some instances, relief team is required to carry food and other essentials through boats to remote places for affected people. These affected people can sometimes exhibit unruly behaviour and become violent, for example, snatch relief items. This creates insecurity amongst the members of disaster management. Around 41 DRROs explained this kind of damaging experience, which they believe is a leading factor for generating negative attitude towards humanitarian supply chain. Studies on psychological behaviour (Deci and Ryan 1985; Reich 2006) and organisational relations (Emerson 1962; Rusbult and Van Lange 2003) postulated that security is key for developing positive impressions that favours attitude. Based on the arguments presented above, this study proposes that:

H4: Insecurity (IS) in supply chain has a significant influence on negative attitude formation towards disaster management for humanitarian assistance.

2.3.5 *Political biasness*

As government officials, DRROs are very careful in acknowledging unexpected political influence on humanitarian assistance during disasters. However, they affirm that on the basis of anonymity, members of ruling political party often attempt to influence selection of disaster-affected people and relief distribution in their localities. Around 38 DRROs admitted to this problem and revealed that this unexpected, but unavoidable influence forces them to deviate from the actual strategy of emergency supply chain. Such failure due to external influences causes change in attitude towards entire humanitarian assistance (supported by theory of planned behaviour).

Through an amendment, top executives who control this humanitarian supply chain (Dubey and Gunasekaran 2016; Dubey, Singh, and Gupta 2015) advice that the selection of distressed people should be done under the recommendation of honourable members of parliament. Although the government's central strategy is to assist distressed people affected by natural disasters, segmentation, targeting and selection for reliefs are substantially dependent on local political recommendations. Scholarly articles on organisational behaviour (Deci and Ryan 1985; Rusbult and Van Lange 2003) investigating unfair practice in employee relations suggest that any biased behaviour can be a strong reason for forming negative attitude towards organisational goal. Disaster management and organisational behaviour studies (Beamon and Balcik 2008) investigating employee motivation identify that influence of political parties in selection and distribution of relief severely undermines the objective of humanitarian assistance. Hence, the proposed hypothesis is:

H5: Political biasness (PB) in supply chain has a significant influence on forming negative attitude towards disaster management for humanitarian assistance.

2.3.6 *Behavioural intention*

The DRROs admit in consensus that field-level members of government emergency supply chain, either direct employees from different organisations or volunteers, have positive inclination towards this humanitarian job. From their intended behaviour, these intra- or inter-organisational members are externally enthusiastic and participate in their assigned jobs. In terms of behavioural intention, the interviewees could not find any tangible issues, although they indicated that the intention could be stronger if they had intrinsic devotion. This lack of intrinsic motivation is presumably the reason behind negative attitude towards this humanitarian programme. Respondents of these consecutive interviews explicitly remembered that all intra- and inter-organisational members, both direct employees and volunteers, are dissatisfied and uncomfortable in working for this emergency supply chain despite their participation. Interviewees rhetorically assume that this lack of comfortableness could be the outcome of negative attitudinal behaviour.

Theory of reasoned action and theory of planned behaviour argue that attitude has a direct cause–effect relationship with behavioural intention, which is also demonstrated by several recently published studies (see Dwivedi, Rana, Janssen, et al. 2017, Dwivedi, Rana, Jeyaraj, et al. 2017; Rana et al. 2016, 2017) on technology adoption. On the other hand, cognitive dissonance theory recommends that conflicting relationship between attitude and behaviour can reflect in lesser satisfaction and weaker performance. Here, the proposed hypothesis is,

H6: Attitude (AT) of the members participating in emergency supply chain for disaster management has negative influence on behavioral intention (BI).

The Beliefs-Attitude-Behavioural Intention Model is shown in Figure 1.

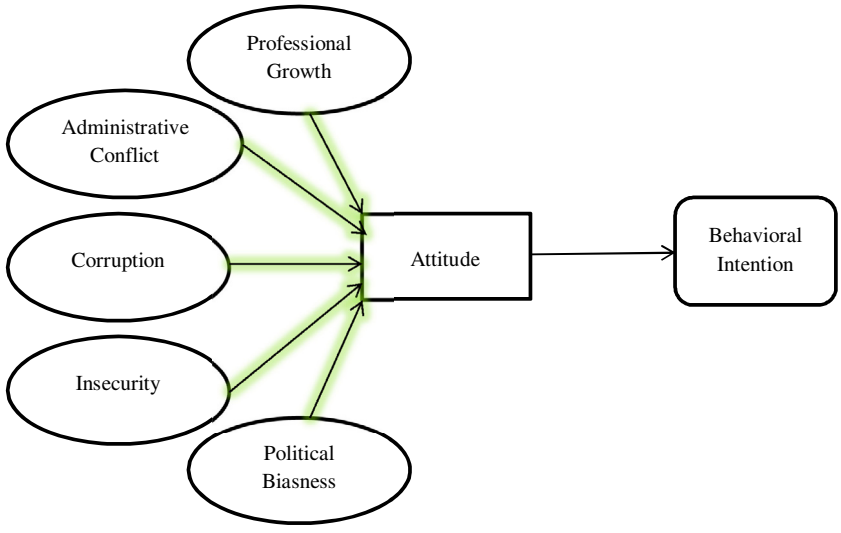

Figure 1. Beliefs–attitude–behavioural intention model.

3. Research method

Quantitative survey approach was utilised to test the causal effect of aforementioned beliefs on attitude and its probable conflicting relationship with behavioural intention of members participating in supply chain for humanitarian assistance. To accomplish the objectives, this study developed a questionnaire to address and investigate the development of unfavourable attitude and its impact on behavioural intention. It had five independent constructs (see Section 2.3) as beliefs, which can lead to negative attitude formation. The five independent constructs were measured by employing a scale consisting of 19 items. Attitude and behavioural intention were identified as the dependent constructs, which were measured using a scale with three items each.

As an exploratory study, the questionnaire was primarily prepared based on the remarks from the 64 DRROs. However, literature review in the respective areas, particularly organisational growth and commitment, provided sources of measurements utilised in this research (Appendix 1). Three university professors in Bangladesh, who have appropriate expertise on survey-based quantitative work in organisational behaviour, emergency supply chain management and employee conflict, reviewed the questionnaire. A pilot study of 20 employees from 5 non-government organisations (NGOs) working in Bangladesh for disaster management was undertaken for usage of words and their potential meaning to measure the related constructs. Finally, a questionnaire of 25 items was developed to collect data necessary for testing the hypotheses and conceptual model presented in the previous section (Appendix 1). The participants were asked to respond to the statements on a five-point Likert scale ranging from '5' (strongly agree) to '1' (strongly disagree).

The respondents for the empirical study were government employees and volunteers participating in disaster operations. They were selected from the 15 most disaster-prone districts (name of the districts were selected on the basis of data provided by department of disaster management, Bangladesh). In each district, 20 questionnaires were randomly distributed among 5 members in district level, 5 in Upazila level, 5 in Union Parishad and 5 in Ward (root level). Union parishad and Ward-level members were volunteers. This led to the distribution of a total of 300 questionnaires in November 2016. The respondents returned the completed questionnaires directly to the researchers on the same day. However, 19 respondents did not reply. Therefore, a total of 281 completed survey responses were received, which provided empirical basis for this research.

4. Data analysis and results

4.1 *Statistical validity*

Since measuring items was mostly adopted from the DRROs' responses, for testing the convergence, confirmatory factor analysis (CFA) was conducted on the five independent and two dependent constructs. Items loading at less than 0.50 were removed (Kline 2005). We reviewed the correlation matrix, and verified the model fit indices with the recommended values for CFA and found that 7 constructs with 25 measurement items could be retained. From the CFA results, it is assumed that the scale items are reflective indicators of their corresponding constructs, which verifies construct validity (Chau 1997). In CFA, the average variances extracted (AVE) for each factor exceeded 0.50; thus, convergent validity was confirmed (Fornell and Larcker 1981). Discriminant validity was also tested for the constructs for the largest shared variance between factors to be lower than the least AVE value for each factor (Chau 1997). It was evaluated using the variance-extracted test (Fornell and Larcker 1981). For any pair of constructs, discriminant validity is achieved if both of their variances are greater than the squared correlations between the two constructs. The lowest AVE value was 0.89 (for CR and PB constructs), which exceeded the largest squared correlation between any pair of constructs (0.7236 – between PG and AT) (Table 1). This finding acknowledges that the shared variance between factors is lower than the AVEs of individual constructs, which confirms discriminant validity.

Table 1. Correlation matrix and AVE.

	IS	AC	PG	CR	PB	AT	BI
IS	**0.93**						
AC	0.010	**0.91**					
PG	0.026	0.405	**0.94**				
CR	0.004	0.0043	0.0056	**0.89**			
PB	0.0007	0.21	0.322	0.0003	**0.89**		
AT	0.015	0.432	0.723	0.002	0.397	**0.96**	
BI	0.0014	0.391	0.604	0.00007	0.392	0.692	**0.97**

Note: Values across the diagonal are square root of AVE and other values are the squared correlations.

Table 2. Reliability measures of independent constructs and their respective scale measures.

Constructs	Cronbach alpha based on standardised items
AC	0.844
IS	0.712
PG	0.912
CR	0.722
PB	0.817
AT	0.951
BI	0.934

Reliability of all constructs measured by the scale items is evaluated by Cronbach's alpha. The reliability scores for all independent and dependent constructs are acceptable as per the cut-off value suggested by Nunnally and Bernstein (1994) (shown in Table 2).

4.2 *Model testing: causal relationship by path analysis*

LISREL was used as the statistical tool for Path analysis; it belongs to the family of structural equation modelling (SEM). Correlation coefficients among the independent and dependent constructs (shown in the Table 1A) were used as inputs. This analysis was conducted under the assumption of covariance-based SEM (CBSEM) since the study is exploratory and the outcome is not predictive enough. In comparison to variance-based SEM, more specifically, the partial least squares (PLS) analysis, this analysis is more appropriate for accuracy of parameters in an exploratory study (Reinartz, Haenlein, and Henseler 2009). After the first phase of analysis for the cause and effect relationship, we found that the primary model fit indices did not fit well with the data. The path diagram displays both the unstandardised and standardised regression weights (factor loadings) for independent variables. The χ^2 statistic was 42.14, df was 5, p-value was at 0.000 and the root mean square error of approximation (RMSEA) was at 0.163. Therefore, the model did not fit well.

Based on the modification indices to improve the model fitness, we added an error covariance between BI and AT. This inclusion improved the model fit. The AC, PG and PB were significant causes of AT at 0.05 levels. Attitude also had a significant effect on behavioural intention at 0.05. However, CR and IS did not have a significant effect on attitude at the 0.05 levels. Their contribution in forming attitude is so insignificant that these factors can be removed from the model. Therefore, the non-significant causal relationships of IS and CR constructs were removed, and according to recommendations, the model was tested again. This time, the three independent constructs had a significant effect on attitude.

The final accepted model is shown in Figure 2. The χ^2 statistic of 3.56 (df = 2, p-value = 0.16871) indicates that the model is of a good fit. RMSEA (0.053) and 90% confidence interval for RMSEA (0.00; 0.140) also display a good fit. Other fit measures indicate acceptable model fitness in alignment with the literature (shown in Table 3)

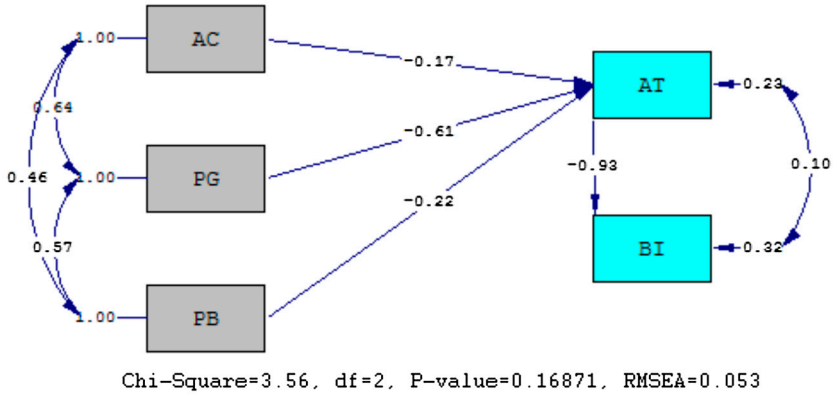

Figure 2. Validated beliefs–attitude–behavioural intention model for disaster management supply chain.

Table 3. Path results.

Fit measures	Recommended values	Validated model
Chi-square (χ^2)	$P \geq 0.05$	3.560 (0.13612)
Degrees of freedom		2.000
χ^2/degree of freedom (df)	≤3.00	1.780
Comparative fit index (CFI)	≥0.90	0.990
Goodness of fit index (GFI)	≥0.90	0.995
RMSEA	<0.06	0.053
Adjusted goodness of fit index (AGFI)	≥0.80	0.962
Normed fit index (NFI)	≥0.90	0.997
Incremental fit index (IFI)	≥0.90	0.999
Relative fit index (RFI)	≥0.80	0.983

(Chau 1997; Kline 2005). The values obtained for squared multiple correlation coefficients (R^2) suggest that 77.1% variance on attitude is explained by three beliefs, namely: professional growth, administrative conflict and political biasness. All three beliefs have a negative impact on attitude formation. Also, 87% variance on behavioural intention is contributed by attitude. Attitude has a significant negative impact on behavioural intention. The relationship between significant beliefs and attitude, and attitude and behavioural intention is numerically shown in Appendix 2. Error covariance for the cause–effect relationships of independent variables with attitude, and attitude with behavioural intention is shown in the numerical relationships (See Appendix 2). Error variances are the amount of variances in each measurement that do not change with the latent factor due to error in predicting actual phenomena. Smaller factor loadings result in larger error variances. Standard errors mentioned in the numerical relations are representing deviation of sampling distribution from the actual population. According to social science study, the identified error is quite justified (Kline 2005).

5. Discussion

Cause–effect analysis through SEM acknowledges that out of the six proposed hypotheses, H1, H2, H5 and H6 are valid. It indicates that AC, PG and PB are significant causes of AT. Attitude also causes behavioural intention. The analysis also suggests that H3 and H4 are not acceptable. This identification asserts that CR and IS are not significant in shaping attitude. The model fitness indices (Table 1A) justify this finding. About 77.1% variance on attitude is explained by these three significant constructs.

Values of unstandardised factor loadings reflect the change in dependent variable for a unit change in the respective independent variables, given the effects of other variables are constant. The three significant beliefs of members participating in government emergency supply chain for disaster management contribute negatively towards attitude formation. Of the three beliefs, PG has the highest negative contribution (0.614). Thus, a unit change in PG will cause a 0.614 unit of negative change in AT, when AC and PB remain constant. Contributions of PG and administrative conflict are −0.215 and −0.172, respectively, in shaping unfavourable attitude. Therefore, the major beliefs contributing towards attitude formation are negative. Heuristically, overall attitude of members involved in disaster management operations is substantially unfavourable towards government emergency supply chain operations. On the other hand, as part of their professional responsibility and accountability, and on humanitarian grounds, they feel compelled to perform effectively. However, due to conflicting and reverse attitude, impressions on disaster operations contradict with behavioural intention. Consequently, their performance is undermined and inefficient. As per the DRROs' confessions, the member performances are below expectations, and they are not active.

Since attitude is negative, its effect on behavioural intention is negative. Unit change in AT causes a 0.933 unit of negative change in BI. This overarching effect on BI is extremely high. Quite expectedly, all organisational members and volunteers working profoundly on disaster management bear negative perceptions about the value and integrity of supply chain operations. This is due to their belief that there are limited career advancement opportunities in such line of work. They also have strong impressions that such humanitarian assistance programme is substantially influenced by political affiliation in selection and distribution processes of relief. Administrative conflict is another severe issue for them. They find inconsistencies in administrative hierarchy, rules and regulations and chain of command due to the absence of interoperable and effective coordination. They also identify lack of authority as a cause of concern. Overall, they find that the overall planning, organogram, direction and controlling system of management are not properly executed. These adverse impressions comprehensively pursue negative attitudes towards disaster management operations, which negatively and strongly influence behavioural intention.

Researchers on emergency supply chain management (Balcik and Beamon 2008; Balcik et al. 2010) revealed similar type of organisational conflicts among members of participating organisations. They identified that due to conflicting issues and diversified agenda of different organisations, while working in a common supply chain, they often find problems in administration. The study conducted by Whybark et al. (2010) acknowledged that emergency supply chain management is always chaotic and faces severe problems in demand forecasting and need assessment, procurement, inventory management and stocking, logistics management, information management and interoperability. This problem can lead to a lack of motivation in employees participating in emergency networks. Consequently, absence of professional growth and interference of local authorities can create further reasons for lack of motivation (Nelson 2006; Reich 2006; Rodriguez et al. 2006). Several researchers on conflicts in disaster management (Balcik et al. 2010; Ballou 2005; Oloruntoba and Gray 2006) confirm that administration conflicts, local political affiliation and absence of employee growth and satisfaction can create detrimental effects on the desired efficiency of emergency supply chain. This finding receives firm support from cognitive dissonance theory. Motivational theories, such as expectancy theory (Vroom 1964) and Herzberg's two-factor theory (1964), offer clear evidence that absence of professional growth, interference from external authorities and administrative conflicts can result in negative attitude towards organisational operations. Consequently, contributions of this study for both organisational theorists and humanitarian supply chain practitioners are significant.

5.1 *Theoretical contributions*

Literature on disaster management (Balcik and Beamon 2008; Balcik et al. 2010; Beamon and Balcik 2008), organisational behaviour (Collins and Hoyt 1972; Cooper and Fazio 1984; Nelson 2006) and supply chain management (Giard and Sali 2013; Han and Dong 2015; Rached, Bahroun, and Campagne 2016) justifies the findings of the study; that is, AC, PG and PB are significant causes for developing negative AT towards existing emergency disaster supply chain operations in Bangladesh. This identification is also supported by organisational theories. Herzberg's two-factor theory (1964) affirms that scope of career advancement and fairness in any organisation are important predictors for employee motivation. Job environment, presence of administrative conflict and biasness also significantly contribute towards forming unfavourable attitude (Rusbult and Van Lange 2003). On the other hand, since corruption and insecurity have root causes in political and administrative problems for emergency supply chain management (Diallo et al. 2017; Stephenson 2005; Whybark et al. 2010), presence of political biasness and administrative conflict has made corruption and insecurity non-significant.

The overall findings of this study can have deep underpinnings from organisational theories like cognitive dissonance theory and theory of planned behaviour. Several researchers, working on cognitive dissonance theory in the organisational orientation (Cooper and Fazio 1984; Gagne, Yekovich, and Yekovich 1993; Gächter, Nosenzo, and Sefton 2013; Nelson 2006) assert that employees, while perceiving conflict between attitude and behaviour, perform below the set standards. Organisational studies (e.g. Deci and Ryan 1985; Hwang 2005) revealed this phenomenon and certified that in such situations, employees feel discomfort and instability, which ultimately leads to unsatisfactory performance. So, instead of many good sides of Bangladesh Government's emergency supply chain, less active performance in the emergency supply chain by many employees, and particularly volunteers, is quite reasonable. Theory of planned behaviour and theory of reasoned action also acknowledge that unfavourable attitude is the source of negative behavioural intention for any organisational performance.

Therefore, this study makes significant contribution to organisational theory. It reflects that during emergency operations, motivational urge for career advancement is very strong. On the other hand, in shedding light on Herzberg's two-factor theory, job contextual parameters like unfairness and conflict can seriously hamper intrinsic motivation.

5.2 *Implications for practice*

This study has enormous practical merit and implication for the higher authorities concerned with policy development of supply chain for disaster management. The results explicitly indicate that although the members participating in disaster management operation are quite competent, the administrative problems cause them to form negative attitudes, which has a subversive impact on their behaviour. Therefore, to derive the full employee potential, some visible career advancement paths will have to be designed. Any kind of political influence and non-transparency issues will have to be eliminated. A well-designed and effective management strategy will have to be established, with the capability of being interoperable, cooperative and coordinated.

Policy-makers should understand the difference between operations, involvement and performance measuring systems for commercial supply chain management and emergency supply chain management. For emergency supply chain management, employees' intrinsic motivation has significant importance. Policy-makers should realise that for any humanitarian operation, this intrinsic motivation could be severely damaged if the employees find any biasness in the system, or external influences with some hidden commercial motives. Government authorities of any country should prioritise this issue of intrinsic employee motivation for successfully accomplishing emergency operations.

From the interviews of DRROs, it was revealed that a major source of administrative conflict arises from overlapping job definitions of employees from participating organisations. The roles and responsibilities of all employees involved in emergency supply chain should be clearly defined, and accordingly motivated through different incentives for better performance. Coordination systems should be clearly defined in the organogram of disaster management for all levels. Empowerment of different officers should be clearly based on the involvement and responsibility defined in the emergency supply chain. Particularly, for better efficiency, delegation of proper authority to DRRO office against their assigned responsibility should be confirmed. Since DRROs receive special training on relief distribution, and the fact that they are playing a key role in district-level disaster operations, their authority should be appropriately aligned with responsibility.

Motivation and job satisfaction is highly congruent with career advancement (see expectancy theory, Vroom 1964). Without ensuring proper career advancement, continual effort cannot be ensured in this repeated emergency work. Management strategy and organisational structure should be reviewed, and allocation of responsibility and authority should be well proportioned. Since disaster management is a sudden phenomenon and needs emergency measures, the administration and interoperability between participating organisations should be extremely dynamic and flexible. Any political unfairness in humanitarian assistance severely undermines the mission of helping distressed people. The government's primary strategy and the strategy for emergency supply chain should be aligned to remove any unexpected external influence.

6. Conclusion

Existing emergency supply chain of Bangladesh Government for relief distribution is sufficiently well managed and is working effectively. It has excellent examples to demonstrate its efficiency and effectiveness. However, like any other supply chain system, this emergency supply chain also has rooms for improvement that can minimise existing weaknesses and problems. The major problem in this regard is inconsistency between attitude and behavioural intention among members who participate in emergency supply chains. They have a negative attitude towards this humanitarian assistance programme for distressed people. They believe that the disaster management operations have several managerial problems. On the other hand, from the behavioural intention perspective, they should be willing and have positive intentions to participate in this emergency assistance programme to support distressed people. However, without perceiving intrinsic willingness, professionally, they are forced to actively participate in this humanitarian programme. Therefore, negative attitude and the consequent behavioural intention have alarming inconsistency or incompatibility, which causes instability in their performance.

According to the cognitive dissonance theory, employees do not find comfort from such a charitable yet tedious work, as they are psychologically disturbed. For such selfless work, behaviourally, the employees should be naturally inclined towards helping the needy. However, due to their many negative beliefs about the administrative arrangement of emergency supply network, their attitude is not favourable towards this operation. This conflicting and contradictory nature between behavioural intention and attitude is the cause of dissatisfaction and demotivation, which ultimately hampers their performance. This finding has a strong underpinning from organisational behaviour and psychological perspectives – cognitive dissonance theory, theory of reasoned action and theory of planned behaviour.

In this context, a thorough investigation across 64 districts in Bangladesh was conducted. Information from 64 DRROs was gathered based on interviews. From these interviews, a set of beliefs, namely – AC, CR, PB, PG and IS – was identified for the development of attitude of the members participating in the government emergency supply chain for disaster management. In the second phase, a questionnaire was prepared to examine the impact of those beliefs on attitude, and identify the plausible conflicts between attitude and behavioural intention. In this aspect, a thorough empirical study was conducted amongst the members of the humanitarian assistance programme in Bangladesh. Based on the path analysis for the collected data, it was revealed that AC, PB and PG are the three significant beliefs, which lead to negative effect on attitude. This negative attitude has a subversive effect on behavioural intention, which results in substandard performance.

6.1 *Limitations and directions for future research*

Attitude in professional life is substantially controlled by income, age, gender and educational background (Shareef et al. 2011; Venkatesh et al. 2003), but this study did not consider the moderating effects of these variables. Future researchers can verify if the inconsistency between attitude and behavioural intention can be moderated by some demographic variables. Although as a geographical context supply chain of Bangladesh Government for humanitarian assistance during disaster can be argued to be similar with other such contexts, any generalised remarks can be more justified if the same study is conducted across other countries having variations in governmental management system. Attitude has three components, namely – cognitive, affective and behavioural. This study restricted focus on the cognitive function. Future researchers can consider other components of attitude and its inconsistency with behaviour. This study employed structural equation modelling to test research hypotheses considering linear relationships among decision variables. In practice, we also observe non-linear relationships among decision variables. Future research can use predictive modelling to investigate any non-linear relationships.

Disclosure statement

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Appendix 1 Questionnaire

Items for constructs used in the proposed research model	Source
CR1. Government emergency supply chain to assist distressed people during disaster is not transparent	DRROs opinion
CR2. I believe all people who are really affected in disaster are not getting relief equally	
CR3. Full relief is not distributed to disaster-affected people	
AC1. Different agencies involved in government emergency supply chain to assist distressed people during disaster have different authorities	DRROs opinion; Mathieu and Zajac 1990; Mowday, Steers, and Porter 1979;
AC2. Government agencies working in supply chain to assist distressed people during disaster have separate chain of command	
AC3. Employees of one department do not like to follow protocol of other departments	
AC4. Different departments working in government emergency supply chain have different management system	
PB1. I find political parties have influence on government emergency supply chain to assist distressed people during disaster	DRROs opinion; Mathieu and Zajac 1990; Mowday, Steers, and Porter 1979;
PB2. . I find political parties are directly involve in government emergency supply chain to assist distressed people during disaster	
PB3. I find government emergency supply chain to assist distressed people during disaster is politically controlled	
PB4. . Political parties try to impose their own interest on government emergency supply chain to assist distressed people during disaster	
PG1. I have no scope to advance professionally through this disaster management task through government emergency supply chain	DRROs opinion; Grohmann and Kauffeld 2005; Guskey and Sparks 1991;
PG2. Participating in assisting distressed people affected during disaster through government emergency supply chain cannot offer me any future career goal	
PG3. I do not find any scope of promotion by participating in government emergency supply chain to assist distressed people	
PG4. I am always working as the same volunteer in government emergency supply chain to assist distressed people	
IS1. While distributing relief, the place is not safe to interact with distressed people	DRROs opinion; Shareef et al. 2011;
IS2. I find interaction with distressed people during any disaster is unsafe	
IS3. The surrounding does not have adequate security measure	
IS4. During relief distribution, the surrounding place does not protect my safety	
AT1. I like to be involved in government emergency supply chain to assist distressed people	Fishbein and Ajzen 1975; Shareef, Archer, and Dwivedi 2013
AT 2. I prefer to participate in volunteer job to assist distressed people during disaster	
AT3. I feel urge to assist distressed people affected during disaster through government emergency supply chain.	
BI1. I intend to participate in helping distressed people affected during disaster in future through government emergency supply chain.	Dwivedi et al. 2016; Fishbein and Ajzen 1975
BI2. I will always try to involve in distributing relief to distressed people affected during disaster through government emergency supply chain.	
BI3. I will always try my best to assist distressed people affected during disaster through government emergency supply chain.	

Appendix 2

AT = −0.172 × AC − 0.614 × PG − 0.215 × PB, Error variance = 0.229, $R^2 = 0.771$
Standard error (0.0350)(0.0385)(0.0328)(0.0195)
BI = −0.933 × AT, Errorvariance = 0.319, $R^2 = 0.870$