

Issues and Challenges in Inter-Organizations' Disaster Management in Underdeveloped Coastal Areas of Pakistan

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DOI: 10.6007/IJARBSS/v4-i5/844 URL: <http://dx.doi.org/10.6007/IJARBSS/v4-i5/844>

Abstract

During recent past years there has been huge investments in disaster mitigation measures in Pakistan. For community resilience many projects are running through financial support of Asian Development Bank and World Bank. Despite these hard efforts heavy human and economic losses are observed each year. To investigate the main cause of mismanagement, this study highlights inter/intra organization coordination challenges during disasters. A questionnaire survey has been conducted in rural coastal areas of Sindh, Pakistan to rank the top challenges of inter-agency relation management. Furthermore, focus group discussions are used to highlight main problems in disaster management among disaster agencies, government departments, international donor groups, NGOs and community members. For remedy of situation and mitigation of disasters, recommendations are provided. This study can be extended to other disaster prone districts of Pakistan and rest of the under developed countries, to serve the calamity struck communities with fewer economic and human losses.

Keywords: Inter-organization challenges, disaster management in coastal areas, hurdles in community development, disaster relief management, Focus group discussions.

1. Introduction

The term “natural disasters & manmade disasters” refer to the serious disruptions to the community or place; that causes huge social, economic and environment devastations, which are beyond the ability of local capacities to cope and deal with (Anderson, 2000; ISDR, 2009). Some of common types of disasters are flooding, drought, wildfires, agriculture diseases and pests, epidemics, earthquakes, landslides, cyclones, terrorist attacks, nuclear explosion and civil unrest etc. This study predominately looks at the risk of cyclones and floods in coastal areas of Pakistan.

The severity of natural disasters due to global warming and various environment factors is rising. The impacts are multifaceted in the fields of human lives, injuries, economic losses, infrastructure damages, public property, and livelihood destruction. The recent disasters like Indian Ocean Tsunami 2004, Kashmir Earthquake 2005, Sichuan Earthquake 2008, Pakistan floods 2010 and Tohoku Earthquake 2011 calls for innovative changes in disaster management practices and closer coordination relation among multi-level stake holders (Ainuddin & Routray, 2012). Government agencies, community development organizations, donors and other key partners in sustainable development need to transform their vast differences in objectives, cultural, political, and operational philosophies into better working relations to mitigate the heavy effects of disasters on affected communities.

2. Community Resilience Programs for underdeveloped areas and their effectiveness in Disaster Mitigation

The coastal districts of Thatta, Sujawal and Badin are situated on Indus deltaic zone are very prone to disasters due to riverine floods, flash floods and cyclones. Historically a major flood has occurred in these districts after 2.4 years. In this zone, all coastal sub-districts are highly underdeveloped rural areas, with the least developed basic infrastructure. The area is lowest in terms of Human Development Index in Pakistan. The community development initiatives and disaster management programs through finance of ADB and World Bank are not new in these areas. For example Sindh devolved social service program 2003-2008, Sindh Coastal Community Development Project 2007-2013 and Water Sector Improvement Project Phase-I 2007-2014. Despite these hard efforts, these areas suffered huge human losses during 2010 flood, Flash floods 2011 and Cyclone Phet 2010 (iMMAP & USAID, 2013). The main reason of these losses is weak early warning system and non-availability of electricity in most parts of coastal areas. The rural people received late warning through Radio or word of mouth, thus responded late and suffered huge economic and human losses. Other main reasons for huge fatalities are poverty, less education, and motivational problems to leave their poorly built homes. These weak structures immediately collapse on first blows of disasters and resulted in heavy damages (Afridi & Siddiqui, 2013).

Previous researchers have utilized field visits of relief camps after disasters to identity the disaster management problems in Sindh (Afridi & Siddiqui, 2013; Gul, 2011). This paper tries a wider scope by studying inter-organizational coordination challenges between the community representatives, disaster agencies, local administration, government departments, NGOs and service companies in disaster mitigation/ community development programs. All the

participants of this study are part of disaster response since 2010 major disasters, and also actively participating in community development projects/processes.

3. Literature Review on Inter-organization Coordination Challenges during Disasters

Inter-agency coordination challenges during disasters are a well-known arena, but a neglected area of research. During critical moments coordination is a challenging task due to continuously evolving conditions and complex circumstances. The complexity could be due to unpredictable outcomes, massive causalities, shortages of resources, lingering side-effects, disruption of public service, collapsed infrastructures, great time pressures, high stakes, highly inter-dependent tasks and communication breakdowns etc. These conditions are further aggravated by personal / organizational conflicts in authorities, interest or motives. Almost all major disasters' studies conclude that ill-coordination is the main cause of high number of damages which needs to be focused (Salmon et. al., 2011).

Recent PhD researchers' approaches have been sought on collaboration-challenges during disasters. These include Nitesh Bharosa Netherland, Syed Ainnudin Pakistan and Boris Petrenji Italy etc. These researches have utilized questionnaire, interviews and literature review for data collection(Bharosa, 2011; Drury et. al., 2010; King, 2005; Petrenj, 2012; Pettit & Beresford, 2009; Yang, 2011; Zhou et. al. , 2011).

To investigate the efficiency and efficacy of disaster management programs, key indicators / factors are drawn from papers/ thesis on collaboration challenges during disasters, Papers on Critical Success Factors for effective disaster management are also used to jot down factors. These factors were used by authors for performance evaluation of information system, industry, supply chain management or critical infrastructures etc. The factors are summarized in figure 1. The summary of these issues is described below.

3.1 Role Definition

The challenges of role definition are (a) conflicts in fixing responsibility and intersecting roles of organization(Drabek & McEntire, 2002). (Schneider, 2005). (b) Agencies have confusion on their part of role, and do not know other agency's role and processes(Comfort, 2007; Enrico, et. al.,1977).

Causes of mismatch between agencies are,(a) responsibility refusal due to acute shortage of resources, (b) there is no higher body to actuate resources / accountability distribution mechanism(Waugh & Streib, 2006). (c)Competing organization have equal position under the regulatory and one party cannot be fixed on leading position to carry out tasks(Berlin & Carlström, 2011).(d) Usually there are multiple coordination structures and poor interlinking between peer positions, therefore assignments are either duplicated or not done(Asplund, et. al., 2009; Maiers, et. al. , 2005).

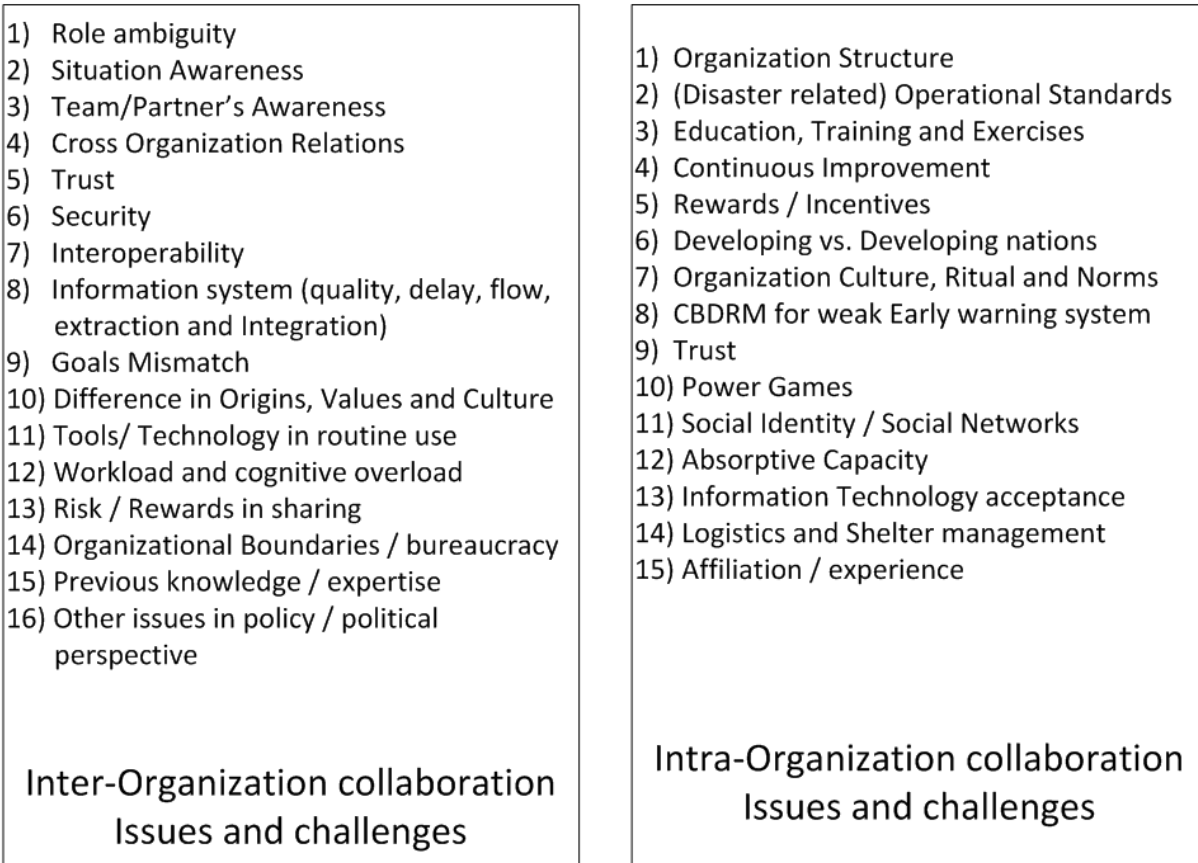


Figure 1: List of factors affecting inter & intra organization collaboration efforts during disasters

3.2 Situation Awareness

In context to disaster management, lack of situation awareness results in heavy damages to the affected community as timely help/information cannot reach the victims. The affected community needs to be informed well ahead of time to minimize their damages. Disaster responders need a continuous update on ground situation, affected population needs, their conditions, and locations for provision of facilities. Remedial actions carried out by disaster responders and their impact and projections can better minimize further destruction.

3.3 Team and Partner Awareness

Disaster mitigation involves collective efforts of a number of agencies, each teams & members working on their respective areas. The front end responders' work is greatly simplified if received information is distilled and fine-tuned. Similarly backend disaster managers have to keep track of inflow of disaster information from a number of resources; they need to continuously compile the data, integration and merge information for decision making purposes. Keeping track of partners and team members' activities is necessary to minimize duplicated efforts or to minimize the risk of missing out vital information that could have very

severe consequences. Team and partners' awareness is the process of managing own organization information, and keeping informed about the partners/competing organizations and serving community.

3.4 Cross Organizational Relations

Managing organizational relations during disasters plays a pivotal role in handling situation. Inter-organization teams with prior working relations, value the professional integrity of other fellow teams. (Grant, et. al., 2002). The cross organization relations can be improved through joint exercises and exchange of information, enforced by law or mutual coordination.

The problems in cross organizational relations identified in literature as (a) due to inadequate interactions and knowhow, do not call each other for help. (b) Partners cannot set aside differences and are unable to carry out joint actions (Drury et. al., 2010), and communication failure (Banipal, 2006). (c) Workers of one organization are unaware of requirements of other agency; do not know what resources each of them possess. And (d) do not know what details to be filtered out or added to, for another participant for best utilization of information (Gonzalez & Bharosa, 2009).

3.5 Trust

Inter-organization relations are highly dependent on trust building between the organizations involved (Canestraro, et. al., 2007), and disaster management is no exception to that (Uhr, et. al., 2008).

The reasons of lack of trust in literature are identified as (a) information is a valuable asset, tendency to hide as it may lose cooperative advantage (Petrenj, et. al., 2013). (b) Fear that information can be used against the organization's interest (c) Dis-trust on the source of information (d) Lack of confidence that government agencies cannot protect the critical information (Bharosa, et. al., 2012; de Andrade & MacDonald, 2013). (e) Usage of resources for personal benefit by some individuals, political agenda and kinship.

3.6 Security

Law, order, security and privacy concern are one of the major threats to vulnerable groups, specially woman and minorities in Pakistan (Shah, 2012; UNHCR, 2011). In terms of inter-organizational challenges the main problems is non-computerization of data, and inability to share sensitive information (Baskerville, et. al., 2014). Infeasibility is mainly due to non-implementation of secured and authorized access, and non-availability of cross-organization information sharing platform (Perry, 2003). Some of the elements are adverse, want to disrupt and eavesdrop communication (Asplund et. al., 2009).

3.7 Interoperability

Interoperability ranges from exchange of communication, information and knowledge to organizations alignment in procedures, operations and objectives. By providing a robust telecom infrastructure, communication black out problems can be solved. A unified emergency operation center system, which connects various stake holders for exchange of information and monitoring the whole disaster event, is crucial for emergency management (Khawaja & Lu, 2013; Khawaja & Xinhai, 2013; Morelli, et. al. , 2010)

3.8 Information system (Quality, delay, flow, extraction and integration)

During the wake of multi-organization emergency response, information is one of the most critical elements for relief teams (Gonzalez & Bharosa, 2009). Since emergency response process is information-centric (House, et. al. , 2013), the effectiveness is largely dependent on available information (Davenport & Pruzak, 2000).

Almost all inter-organization emergency response researches are done for betterment / development of information system. Disaster Information system has four benchmarks Quality, delay, flow, extraction and integration(Bharosa, et. al. , 2010).

3.9 Goals Mismatch

Multi-stake holder disaster management involves a number of parties with conflicting interest, and mistrust between them could harm the harmonization process during disaster handling. For example conflicts between Japanese government and Tokyo Electrical Company caused delays in response after nuclear disaster in 2011 (Onishi & Fackler, 2011). Comfort & Okada (2013) suggested that the main goal of disaster management is to keep situation under control. And participants should be focused on common goals for saving lives, minimizing damages and continuity of operations.

3.10 Differences in Origins, Religions, Values and Culture

There are number of issues emerged when cross-regions/inter-religious nations come for relief efforts, some of most notable issues are due to language (Lachlan, et. al., 2014), religion and beliefs (Sumathipala, 2014), operation standards, rules and procedures (Koliba, et. al., 2011), technology used, skills, experience (Djalante, et. al., 2010) and indigenous Knowledge (Mercer, et. al. , 2010).

3.11 Tools / Technology in routine use

Tools not used during normal basis, will not be used effectively during disasters (Militello, et. al., 2009). Communication breakdown and congestion causes inaccessibility of telecom services. Emergency services should be provided through resilient infrastructure and dedicated channels (Quarantelli, 1997; Scholl & Patin, 2014)

Tools and technology incur high expenses on up gradation/installation; there should be state level / national level arrangements for continuous update of apparatus/software for enhancing the capabilities.

Usage of non-electronic medium such as boards, pen and papers is important part for passing on awareness in Emergency Rooms. Emergency responders' exercises without the usage of digital apparatus, with low tech equipment like walkie-talkies, pen and paper are important. As major disaster causes facilities to collapse(Way, 2013).

3.12 Workload and Cognitive Overload

The most experienced participants quickly adjust with the situation and bear the maximum load of the operation. This creates uneven workload distribution during disasters. Stress and fatigue result in performance degradation. There should be appraisal system to reward, monitor and distribute the workload; training and education have positive effects on capacity development of human resources (Gryszkiewicz & Chen, 2010; Militello et al., 2007; Smilowitz & Dolinskaya, 2011).

Difficult disaster status rich in variables and distorted communication result in cognitive overload, and required information is difficult to extract. Current information systems are ineffective in fusing information (Bharosa, et. al. , 2011).

3.13 Risks / Rewards in Sharing

Government bodies with no experience on information sharing lack understanding on benefits of sharing knowledge, and due to fewer interactions less awareness of requirements of other agencies and what information each of these possess (Lam, 2005; Landsbergen, et. al., 1998). Usually Organizations have made substantial efforts for implementation of standards, information systems, accounting procedures, monitoring mechanisms, planning and operations that are contradictory to other organizations, which make it difficult to share information with other organizations (Canestraro et al., 2007; Navarrete, et. al., 2010). Cross-boundary information sharing requires changes in laws, structures and processes, some individuals will resist this change due to inertia and loss of power (Lazer & Binz-Scharf, 2004). Lack of financial, human and technical resources can hamper the initiatives of cross-organizational sharing when organizations are more focused towards immediate issues and short-term benefits of cross-organization sharing cannot be foreseen(Landsbergen & Wolken , 2001). Through perspective of cost-benefit analysis incentive can play important role in cross-organization sharing. Organizations have spent budget, time and staff for collecting the information, knowledge and resources. Without proper compensations/rewards agencies will not be willing to share their part with other agencies (Dawes, et. al., 2009).

3.14 Organizational Boundaries

In multi-agency relation management, information flow / resources management across departments, functionaries and organizations is hindered both in vertical and horizontal directions, which has been a research focus of many scholars (Black et al., 2003; Bounty, 2002;

Carlile, 2004). Red tapes and command structure are the major hindrances for flow of knowledge and information (Pandey & Bretschneider, 1997). Hierarchy and departmentalization can impede information flow between other departments and organizations (Creed & Miles, 1996). Organizational boundaries are difficult to cross, are result of specialization, accumulated experience, affiliations, visions, missions, available resources, capabilities, designated authorities and legislations (Yang, 2011).

3.15 previous knowledge / expertise (Transfer of tacit & explicit Knowledge)

Tacit knowledge (in comparison of explicit knowledge) cannot be transferred via coded form; it is important part of disaster response. Previous experience and lesson learned are used for future management of disasters (Garcia, et. al., 2014).

3.16 other issues in policy / political perspective

Government may inflate the statistics in order to get higher humanitarian aid , or deflate in order to mislead the international community (King, 2005). Media and public can assert both negative and positive impact on information sharing. Language characters can have influences on passing on information about disasters. Environmental and development concerns have impacts on disaster management practices(Yang, 2011).

4. Methodology for identifying key issues in disaster management

This study uses both primary and secondary data for identification of problems in disaster management practices in Coastal areas. Secondary data include public reports, research papers and disaster management documents by national/international agencies. A layout of key hurdles in disaster management in study area is formed by non-structured interviews of 39 community members, NGOs, government officials and disaster agency personals. Through literature review on inter-organizational challenges during disasters, a questionnaire was developed. The questionnaire has been constructed by taking questions from previous researchers' work, then modifying them according to needs of study area.

Total 116 questionnaires have been filled in by the respondents, during the period from Nov 2013 to February 2014. After scrutiny only 72 questionnaires are found relevant to the study area (Thatta, Badin and Sujawal), complete and valid responses. These questionnaires are filled by District government officers grade 18, Govt. Department officers grade 18 (Irrigation Dept., SIDA, and Forestry), Trainers (Fisheries and Livestock), School Teachers (Primary and Secondary Schools), Landlords, Community Based Organizations (Agriculture, Fishing and Industries), root level community workers, NGO (executives) and media (print media, Radio Jockeys and bloggers). According to the respondents, the top factors creating barriers in disaster management in Coastal Areas of Thatta and Badin, are given in table-I (the average value of each factor is provided).

For qualitative data analysis, and understanding of key stake-holders' perception about disaster management challenges, six Focus group discussions are held in Thatta, Sujawal and Badin. Each focus group consists of at least 10 persons from Community Based Organizations

(Fisherman and Agriculture), NGOs, local government, landlords and media. The results are discussed below. The previous studies' references are provided, where possible.

4.1 Weak commutation infrastructure and poor basic facilities

The whole coastal regions except Karachi are under developed. There roads infrastructure in Badin and Sujawal are highly underdeveloped and routes for evacuation are strictly limited. There is urgent need to develop better roads for better management of disasters.

In terms of Education, coastal areas are lagging far behind the rest of the country. Due to unsafe drinking water, water borne diseases are common. Basic health center are far located, and facing severe human resource shortages. Though Sindh Coastal Community Development project, Pakistan poverty alleviation fund PPAF has started many projects through finance of ADB and World Bank. But arrangements are not enough. Alternate financing mechanism through philanthropic and social sector should be made to ensure safe drinking water. Mobile clinics and telemedicine van can address health issues of the far flung coastal community (Khawaja & Lu, 2013; SCCDP(Pak), 2012).

Table-I: Ranking of Top coordination challenges in disaster Management in Thatta, Badin and Sujawal districts

Ranking of coordination Issues In Badin District (Laar Region) and average of responses Scale(1 to 5)		Ranking of coordination Issues In Thatta and Sujawal Districts and average of responses Scale(1 to 5)	
Issues	Average of responses	Issues	Average of responses
Information and communication system for CBDRM (LBOD warning)	2.03	Situation Awareness (disaster prediction etc.)	2.13
Shelter and Logistics Management	2.06	Role definition in disaster policy	2.26
Security	2.14	Goals and Objective matching of stakeholders	2.37
Goals and objective matching of stakeholders	2.27	Mutual Trust	2.45
Team / partner awareness	2.36	Shelter Management	2.53
Role definition in disaster policy	2.43	Disaster Education and Trainings	2.62
Disaster Education and	2.48	Information technology	2.73

Trainings		acceptance	
Information technology acceptance	2.49	Security	3.2

4.2 Weak Early Warning system and Electricity Problems

The majority of coastal areas are off the national grid. Few rural villages are equipped on renewable energy resources. Therefore means of early warning is one of the weakest areas. Majority of coastal villagers received late warning through word of mouth or radio, thus reacted late, and received heavy damages during floods 2010 and 2011. The local authorities should tap the potential of radio communication and equip the communities with radio sets for better disaster management. TETRA based resilient mobile technology sets should be provided to disaster responders, to cover up the weaknesses in cellular communication (Khawaja & Xinhai, 2013).

4.3 Shelters / Food for the vulnerable groups

The weak, poor, woman, children and minority faces a lot of discrimination during relief process. Usually food packets are thrown at the relief camps for distribution. Due to rampage and chaotic situation, only physically strong persons are able to get food. Better distribution methods need to be adopted to stop humiliation of disaster affected population.

Due to low elevation of coastal areas, flood water remains for many months. And distress population need to vacate school for startup of education. Secondary evacuation brings further miseries to the depressed population. Better shelter places need to be constructed for future disaster plans. So, far vulnerable groups have suffered most in the disasters; therefore future plans need to give special consideration to their issues (UNHCR, 2011).

4.4 Security Issues due to economic reasons

The coastal areas have extraordinary high birth rate, 6-8 persons per family. The wealth patterns are highly skewed. For example only 9% household owns 80% land in Badin district. Due to high poverty, the area residents loot the relief items of displaced population. This brings further depression to distressed people. Therefore district government need to take care of this issue and special arrangements for security should be made in cooperation with law enforcement agencies in future disasters (UNHCR, 2011; WB, 2005).

Pakistan needs to frame Land Usage policy to stop people settling in highly disaster prone areas, and betterment in lives of landless people. Health department need to focus on promotion of contraceptive methods to ease down population burden and economic pressures in the region.

4.5 Poor disaster financing and weak monitoring mechanisms

Pakistan disaster financing is heavily relied on international donations. Faith based and political parties play a vital role on relief process. Due to bad reputation, the international community is providing relief and rehabilitation distribution through NGO and Community Based Organizations CBOs, under the United Nations One DRM setup.

NGOs have sprung like mushrooms all over the country for community welfare projects running under finance of foreign aid. Most of NGOs are poorly financed, thus unable to provide quality output. Corruption and kinship are common problems. There should be more strict monitoring mechanism, rules and regulatory to ensure better working of the NGO and CBOs (Lehotonen, 2013).

4.6 Disaster Awareness, Training and Education

The disaster training programs are concentrated towards NGO and government officials. There is sheer lack of disaster awareness in the general public, and need to introduce disaster courses in schools (BRI & GRIPS, 2007).

4.7 Promotion of tourism and Industries for the economic development

The whole coastal areas zone has historical significance. Specifically Islam has entered South Asia through Thatta (Debal). Many famous shrines and historic places are present here. Therefore Tourism development cooperation should promote events for development of Tourism industry in the areas.

Very few industries are present in these areas. Badin is producing 50 % of crude oil of Pakistan. Very few local residents are employed in oil industry. There should be more employment opportunities for local population by setting up economic zones in this area (SCCDP(Pak), 2012).

5. Recommendations

There are number of suggestions provided by Focus group participants. Following are mutual agreed recommendations for the betterment in disaster management/community development in the study area.

- 1) Further development programs to increase the livelihood opportunities of the residents. Information technology projects to bridge the digital divide gap. Distance education and telemedicine from telecommunication to lower the human resources shortages in Health / Education.
- 2) Government should provide Satellite phones or other resilient technologies to the residents to enable community based disaster risk reduction measures. As early warning system is unreliable and badly under capacitated.
- 3) New shelters, specially raised floor type should be constructed in the coastal areas.
- 4) Vulnerable groups are so far most neglected. Disaster authorities should take necessary measures to provide food to weak, woman and children. Better latrines should be made for

females and children. Necessary steps should be taken to lower gender and other discriminations in the disaster areas.

5) Government should bring land reforms and make arrangements for landless peasants. Religious figures should make their contributions to control the very high birth rates, to ease down economic pressures.

6) Alternate financing mechanism for disaster management should be sought. Single reporting platform between disaster responders and disaster financiers like iMMAP can lower the barriers in confidence. The resilient communication should be ensured during disaster for proper working of this project. Better laws for NGO monitoring and transparency in financing should be made.

7) More public awareness campaign should be run at national level. Disaster awareness courses should be introduced at school level.

8) Government should setup industrial zones for enhancing the economic activities in the coastal areas.

6. Conclusion

This paper provided a case study of inter-organization challenges in coastal areas of Sindh, Pakistan. Every year Pakistan faces a major disaster, resulting in heavy economic and human losses. The main reason of these huge losses is that there are still retroactive approaches followed rather than proactive approaches. The better management of disasters requires better coordination among various stake holders of community and disaster management. This paper studies and highlights the main issues and challenges between various stakeholders and offers recommendations for their improvements. Pakistan need to bring about changes in NGO regulations, shelter management, roads development, disaster financing, introduction of disaster courses at school level and improving security at the camp sites. By utilization of disaster resilient telecommunication infrastructure, disaster warning situation and inter-agency coordination relation will greatly be improved. Thus concepts presented in this paper can be materialized for the betterment of disaster management practices at national level to other districts in Pakistan.

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