CHAPTER – II

REVIEW OF LITERATURE

2.1 Introduction

Natural disaster management has become a challenging task of our times. Farmers need to be sensitized about the occurrence of natural disasters in order to cope with them and enhance agricultural production and productivity. New media have increased the communication between the facilitators of development and beneficiaries of development across the globe. New media also provide the benefits of interactive user feedback, constructive participation and community formation around the media content. There is greater penetration of new media into rural and remote areas across the world. A good deal of interest has been aroused in India and abroad on the role of new media as an instrument of natural disaster management and agricultural development processes. But there is only scattered empirical evidence about the uses, gratifications and effects of new media in this regard. The notable works done in the field of new media intervention for natural disaster management and agricultural development from local to global levels are presented in this chapter.

2.2 International Studies

Bucher (1957:46) assessed the blame and hostility in disaster and observed that people were not adequately sensitized by the formal and informal sources of communication on the role of media in the prevention and management of natural disaster in modern world. The scholar also observed that a new discipline namely ‘natural disaster management’ should be developed on the basis of integrated and systematic approaches.

Anderson (1969:10) analyzed the disaster warning and communication processes in two communities and noted that communications media were not properly utilized by the administrators for effective prevention and management of natural disasters which affected the national economy adversely. The scholar also observed that communication should become an important component of natural disaster management in order to boost national economy in modern society.
Byrnes (1971:53) examined the role of communication in agricultural development with reference to developing nations. The study reveals that communications media neglected agriculture sector which serves as the backbone of economy in most of the third world countries. The scholar highlighted the need and importance of systematic media intervention for natural disaster management, agricultural promotion and community welfare activities.

Quarantelli and Dynes (1972:252) studied the disaster occurrence and media intervention for natural disaster management and found that government and media organizations did not put forward coordinated efforts for the prevention of natural disasters on the basis of proper research and extension activities. The scholars also pointed out that scientific media intervention for natural disaster management would facilitate better agricultural promotion and economic development in modern world.

Waxman (1973:353) evaluated the role of local broadcasting in natural disaster management and reported that radio was the most alive, active and useful medium of communication in times of natural disasters. The scholar also noted that broadcasting agencies should be utilized by the authorities responsible for natural disaster management in order to prevent the occurrence of natural disaster and facilitate systematic management of natural disasters on the basis of proper community education and participation.

Kueneman and Wright (1975:177) assessed the new policies of broadcast stations for civil disturbances and disasters and observed that broadcast stations were not equipped properly for effective dissemination of information to the various stakeholders of natural disaster management. The scholars suggested that public administrators and broadcasters should work together to manage the natural disasters and facilitate greater productivity in all walks of national economy.

Hanningan (1976:138) analyzed the newspaper conflict and cooperation content after disaster and noted that newspapers glorified the occurrence of natural disasters in order to increase their circulation and revenue. The scholar also pointed out that newspapers should play a responsible role in the systematic management of natural disasters in modern society.
Needham and Nelson (1977:224) examined the newspaper response to flood and erosion hazards on the North Lake Erie Shore and found that newspapers did not respond positively for effective management of flood and soil erosion in the study area. The scholars also noted that newspapers should act with great sense of responsibility and facilitate proper management of natural disasters such as floods.

Christensen and Ruch (1978:70) examined the role of brochures, radio and television presentations on hurricane awareness and pointed out that radio played a notable role in the forecasting and management of natural disasters when compared to broachers and television. The study also revealed that television coverage of natural disasters such as hurricane was not positive and glorified the natural disaster which weakened the morale of the authorities and people.

Combs and Slovic (1979:72) studied the newspaper coverage of causes of natural disaster and death and reported that newspapers glorified the harmful effects of natural disasters beyond proportion. The study revealed that newspapers did not live up to the expectations of the people in alerting the authorities and general public’s about natural disasters. The scholars suggested that newspapers should assist the authorities in the meaningful management of natural disasters and prevent loss of life of the people.

Drabek (1979:88) evaluated the role of communication in natural disaster management and reported that communications media did not play a crucial role in the prevention of natural disasters on the basis of suitable instructions and guidelines. The study revealed that media intervention for natural disaster management should be improved on the basis of suitable research and development endeavors.

Meltzer (1979:208) assessed the communication of scientific information to the wider public in California with special reference to seismology in California. The study observed that scientific information was not adequately communicated to the stakeholders of natural disaster management in the study area. The scholar called upon the authorities and media professionals to safeguard the interest of people by providing timely, relevant and adequate information support for natural disaster management.
Okabe et al. (1979:239) analyzed the people’s responses to an earthquake prediction warning in Tokyo on the basis of survey research and noted that people were not sensitized properly by the authorities and communicators. The scholars also pointed out that authorities of natural disaster management should make use of all communications media to alert the people and enable them to respond positively in times of natural disasters.

Rosengren and Sturesson (1979:272) examined the role of radio in natural disaster situation and found that radio was the most effective and supportive medium of communication with respect to prediction of natural disasters. The scholars also observed that other media should be properly utilized by the authorities to facilitate meaningful management of natural disasters in the interest of national development.

Alexander (1980:07) studied the role of print media in the management of the Florence floods and pointed out that print media were not properly utilized by the authorities concerned to educate the people in times of floods. The study also reported that print media could be effectively utilized by the authorities for effective management of post-flood rehabilitation operations in the interest of society and economy.

Carter (1980:62) evaluated the community warning systems and broadcast media in times of disaster management and reported that systematic coordination was not achieved by the broadcast media, emergency service agencies and national weather service authorities in the study area. The scholar also noted that effective coordination among these three agencies would minimize the harmful effects of natural disasters and facilitate meaningful post-disaster management activities.

Kreps (1980:174) assessed the research needs and policy issues on mass media disaster reporting and observed that media intervention approaches were not developed on the basis of systematic research efforts by the agencies concerned. The scholar also suggested that media institutions should be sensitized by the researchers and other stakeholders in order to manage the natural disasters on the basis of systematic evaluation.

Morentz (1980:212) analyzed the role of communication in the management of Sahel drought and noted that communications media were not properly utilized by
the authorities concerned to effectively manage the drought situation in the study area. The scholar also noted that local, regional and national media institutions were not properly involved in the management of drought situation by the authorities. The study suggested certain useful guidelines for sound media intervention approaches in times of drought and other natural disasters.

Scanlon (1980:281) examined the role of media during the 1978 Terrace floods and found that media did not play a pro-active role in the prevention of the floods as a matter of social responsibility. The study also reported that media should play a pro-active role in the prevention, management and rehabilitation processes in times of natural disasters on the basis of humanitarian approaches.

The Committee on Disasters and the Mass Media (1980:73) studied the role of mass media in natural disaster management in America and pointed out that media did not play a crucial role in the effective management of natural disasters in the study area. The committee also provided certain healthy norms and guidelines for proper media intervention for effective natural disaster management on the basis of in-depth understanding of the subject concerned.

Turner (1980:332) evaluated the relationship between mass media and natural disaster management on the basis of the report submitted by a committee of experts. The scholar reported that the committee examined the process, consequences and remedial measures with respect to natural disasters and suggested practically viable strategies for systematic media intervention for natural disaster management in the study area.

U.S. National Research Council (1980:333) assessed the role of mass media in natural disaster management and observed that mass media were not practically prepared for effective prevention and management of natural disasters in the study area. The council also suggested that mass media should be sensitized by the policy makers, administrators, researchers and other facilitators of natural disaster management as a matter of corporate social responsibility.

Wenger and Faupel (1980:353) analyzed the role of mass media in natural disaster management on the basis of systematic empirical study and noted that mass media highlighted the occurrences of natural disasters rather than providing
preventive and rehabilitative guidance and support to the authorities and general public’s. The scholars also pointed out that mass media should be equipped well with better strategies, manpower, technologies and other supportive systems for effective management of natural disasters.

Wenger (1980:356) examined the relationship between the mass media and disaster knowledge and found that mass media did not provide timely and relevant information and education to the masses about the natural disasters. The scholar noted that mass media should serve the society by creating necessary awareness among the people about the occurrence and management of natural disasters.

McKay and Finlayson (1982:205) studied the role of mass media in times of flood caused by the River Torrens and pointed out that individual motivation among the media professionals was not adequately demonstrated in times of flood. The scholars also pointed out those authorities failed to obtain a flood inundation map in order to cope with the flood situation and rescue the affected persons.

Rubin (1982:273) evaluated the dissemination of disaster-related information to public and private users in Colorado and reported that the agencies concerned with natural disaster management did not enlist the active participation of mass media in order to provide timely disaster related information to public and private users. The scholars also pointed out that effective coordination between the authorities of natural disaster management and media professionals would go a long way in protecting the nature, economy and people.

Scanlon and Allred (1982:283) assessed the media coverage of disasters and observed that the media institutions did not contribute substantially for the effective management of natural disasters. The scholars also noted that the process of natural disaster management should be strengthened on the basis of sound media intervention strategies based on consultation with experts in the subject concerned.

McKay (1983:203) analyzed the newspaper reporting of bushfire disaster in south-eastern Australia and noted that the causes and consequences of bushfire disasters were adequately reported by the news papers in the study area. The scholar also noted that local authorities and other stakeholders were guided by the
newspapers about the meaningful management of bushfire disaster in the interest of people.

Goltz (1984:122) examined the role of news media in the management of natural disaster on the basis of systematic content analysis of emergency response imagery. The scholar found that news media provided a highly glorified coverage of natural disasters and caused greater anxiety among the various stakeholders including the people. The scholar also suggested that news media should play a responsible role in the rehabilitation of the affected persons in times of natural disasters.

Ikeda (1984:148) studied the functions and activities of mass media during disaster and pointed out that mass media did not live up to the expectations of the people in the effective management of natural disaster. The scholar also noted that mass media did not have adequate competent professionals to provide authentic and useful education and guidance to the people about the prevention and management of natural disasters.

Mikami (1984:209) evaluated the disaster reporting with reference to the Nihonkal-Chuubu earthquake and reported that mass media played a responsible role in the management of the natural disaster. The scholar also noted that mass media played a pro-active role as the voice of the people and sensitized the authorities to effectively manage the post-earthquake operations.

Nimmo (1984:228) assessed the television network news coverage of Three Mile Island and observed that advanced tools, technologies and strategies were not adopted by the television network to facilitate effective natural disaster management in the study area. The scholar also suggested that reporting natural disasters should be carried out by the broadcasting networks on the basis of tested and tried technological fables.

Okabe et.al. (1984:233) analyzed the role of mass media in disasters with reference to Japan and noted that the media and disaster management agencies had achieved effective coordination in the management of natural disaster. The scholars also pointed out that the authorities in Japan were fully equipped and competent
enough to manage the natural disasters by obtaining the active participation of media, non-government organizations and people.

Hiroi and Miyata (1985:144) examined the role of mass media in the natural disaster management and found that mass media were not properly motivated and equipped to report the emergencies on the basis of correctness and responsibility. The scholars also observed that mass media should be prepared to report the natural disasters on the basis of proper planning, consultation and responsibility.

Quarantelli (1985:253) studied the effectiveness of film medium in times of natural disaster management and pointed out that the disaster films did not portray the hard realities of life. The study also observed that films should be produced on the basis of ground realities rather than mythologies in order to develop scientific temperament among the people and manage the natural disasters on the basis of scientific and systematic approaches.

Scanlon et.al. (1985:282) evaluated the role of mass media in times of natural disaster management and reported that mass media did not enable the people to cope with natural disasters on the basis of sound facts, figures and inputs. The scholars also noted that mass media should focus the attention of various stakeholders on some predictable problems and improve the effectiveness of natural disaster management on the basis of sound media strategies.

Hiroi et.al. (1985:144) assessed the operations of mass media in disasters, the content of messages on the basis of an empirical study in several communities in Japan. The scholars observed that broadcast media were the primary source of information in times of natural disaster management in most cases. The scholars also noted that the warnings often did not reach a complete range of audience and failed to induce an adaptive response among the recipients. The scholars noted certain difficulties in mobilizing resources, uncertainties in reliable news sources and malfunctioning of communication channels with respect to the subject concerned. The scholars suggested that mass media should provide timely warning in times of disasters and facilitate effective management of natural disasters.

Wenger (1985:354) analyzed the role of mass media in natural disaster management and noted that mass media coverage of natural disasters was not based
on adequate and systematic preparations. The scholar also pointed out that mass media should be well equipped with sound approaches and resources in order to prevent the occurrence of natural disasters and facilitate systematic rehabilitation programmes on the basis of justice and responsibility.

Wilkins (1985:361) examined the role of television and newspaper in the management of natural disaster and found that newspapers provided in-depth analysis of natural disasters and contributed substantial ideas and guidelines when compared to television in the study area. The study also reported that television coverage was primarily related to the rehabilitation of the affected people in the natural disaster prone areas.

Adams (1986:01) studied the role of television in the management of natural disaster and pointed out that television coverage was based on business consideration rather than humanitarian consideration. The scholar also pointed out that television coverage of natural disaster should be based on proper planning, organization, coordination and evaluation in order to prevent certain harmful effects on the people.

Beady and Bolin (1986:30) evaluated the role of the black media in disaster reporting to the black community and reported that black media emerged as an effective alternative media of communication in the study area. The study also reported that black media coverage of natural disaster was based on compassion, commitment and competence. The scholars suggested that black media professionals should be oriented systematically in order to improve the status and quality of reporting in times of natural disasters.

Gaddy and Tanjong (1986:114) assessed the earthquake coverage by the Western press and observed that western press was primarily interested in the glorification of the earthquake rather than humanitarian rehabilitation of the affected persons. The scholars also suggested that western media should think beyond racial consideration while reporting earthquake and facilitate judicious coverage of earthquake on the basis of sound professional considerations.

Hirose (1986:145) analyzed the psychological impact of the Tokai earthquake prediction by the mass media and noted that mass media had brought
about anxiety among the people in times of Tokai earthquake. The scholar noted that mass media should report the natural disasters including earthquake on the basis of wisdom, concern and responsibility in order to minimize adverse psychological impact on the people.

Needham (1986:223) examined the newspaper types of natural hazard information potentials with reference to cosmopolite-localite model and found that newspapers under study did not provide suitable information on natural hazards to the readers. The scholar also observed that newspapers should provide healthy, balanced and responsible coverage of natural disasters and enhance their credibility and social responsibility.

Phillips (1986:245) studied the relationship between mass media reporting and volunteerism and pointed out that mass media did not firmly deal with disaster threat situations in the study area on the basis of social concern and volunteerism. The scholar called upon the media professionals to extend timely, relevant and responsible coverage of natural disasters in order to safeguard public interest.

Wenger and Friedman (1986:352) evaluated the local and national media coverage of disaster and reported that national media demonstrated better accuracy, concern and responsibility in the coverage of natural disasters when compared to local media. The scholars also observed that local media were not properly equipped with trained and specialized manpower and resources in order to effectively report the natural disasters due to certain financial constraints and lack of professional volunteerism.

Bolduc (1987:42) assessed the natural disasters in developing countries with respect to the myths and the role of the media. The scholar observed that mass media in developing countries were not fully competent enough to ensure judicious and responsible coverage of natural disasters due to certain constraints and limitations. The scholar called upon the media in the developing nations to equip themselves with better human resources and technological devices for effective coverage of natural disasters.

World Commission on Environment and Development (1987:371) analyzed the need for achieving environment – friendly development in the world since the
various stakeholders of development had failed to achieve the goal of sustainable development. The commission also called upon various national governments and non-government organizations to achieve the goal of sustainable development by striking a meaningful balance between environment and development across the globe.

Burkhart (1987:50) examined the role of disaster journalism which had emerged as a prominent branch of contemporary journalism across the world. The scholar also found that the press in the study area was under tremendous stress due to absence of preparedness, resources, technologies and strategies. The study suggested that disaster journalism should be developed on the basis of social concern, professional excellence and individual volunteerism.

Singer and Endreny (1987:302) studied the costs and benefits of reporting natural hazards and pointed out that the coverage of natural disasters involved more investment when compared to other kinds of reports. The scholars also observed that systematic reporting of natural disaster management benefitted the society in several ways even though it was economically quite expensive.

Sood et. al. (1987:314) evaluated the role of news media in natural disaster management and reported that the news media did not operate well on the basis of proper planning and execution in times of natural disasters. The scholars suggested that modern news media should be equipped with specialized man power, advanced technologies and standardized approaches in order to enhance the professional status and social utility of natural disaster reporting.

Wilkins and Patterson (1987:360) assessed the construction of news relating to natural disaster management on the basis of systematic risk analysis. The scholars observed that most of the news media failed to carry out systematic risk analysis with respect to reporting of natural disaster management. The study suggested that scientific risk analysis would enrich the process of media coverage of natural disasters.

Wilkins (1987:360) analyzed the American perceptions of the Bhopal Disaster and noted that American media failed to assess the consequences of Bhopal disaster due to lack of social commitment. The study also reported that coverage of
Bhopal disaster demonstrated trivialization which affected the credibility of American media with respect to the subject concerned.

Patterson and Wilkins (1988:239) examined the reutilized reporting of technological accidents with respect to television coverage of the Chernobyl disaster. The scholars found that television coverage failed short of the expectations of the scholars since it was biased and irresponsible. The study also noted that market forces diluted the objectivity and responsibility in regard to the coverage of the Chernobyl disaster.

Wrathall (1988:376) studied the natural hazard reporting in the U.K. press and pointed out that natural hazard reporting was carried out on the basis of priority and professional obligation in the study area. The scholar also noted that the British press analyzed the causes and consequences of natural disasters on the basis of authority and responsibility.

Ledingham and Walters (1989:186) evaluated the role of mass media during hurricanes and reported that the coverage of hurricanes was quite accurate and responsible in the study area. The scholars also pointed out that the coverage of hurricanes should be carried out on the basis of proper assessment, preparation and mobilization of resources and strategies.

Perry and Lindell (1989:243) assessed the role of communication in times of volcano hazards and observed that mass media failed to predict the occurrence of volcanoes due to non-availability of technological know how’s. The study also reported that absence of coordination between the disaster management authorities and media professionals was also mainly responsible for the poor state of coverage.

Reid (1989:265) analyzed the role of press in natural disaster management and noted that print media were not equipped with necessary human resources, technological devices and practical strategies to ensure judicious coverage of natural disaster management in the study area. The scholar suggested that press should play a responsible role as the angel guardian of society in times of natural disaster management.
Stockdale and Sood (1989:321) examined the role of public information system in natural disaster management in Coalinga and found that public information system was not well equipped with necessary resources, strategies and services in respect of coverage of natural disaster management. The scholars also observed that public information system should be strengthened on the basis of proper sharing of expertise and mobilization of resources in order to ensure optimum success in the media coverage of natural disasters.

Walters et.al. (1989:350) studied the role of communication in times of natural catastrophe and pointed out certain bad tidings on account of absence of resources and strategies in the study area. The scholars also suggested that communication should become an important component of natural disaster management in order to facilitate smooth management and rehabilitation programmes.

Wenger and Quarantelli (1989:355) evaluated the local mass media operations, problems and products in times of disasters and reported that local media suffered from serious constraints and limitations with respect to coverage of natural disasters. The scholars also observed that local media should be equipped with state of the art resources, services and facilities in order to do justice to their role in times of natural disaster management.

Wiegman et.al. (1989:359) assessed the newspaper coverage of hazards and the reaction of readers with respect to natural disaster reporting. The scholars observed that readers were not satisfied with the uses and gratifications of natural disaster reporting by the newspapers under study. The scholars also suggested that newspapers should have specialists in natural disaster reporting and contribute significantly towards sound natural disaster management.

Fair (1989:98) analyzed the relationship between media and development which reveals the impact of dominant paradigm of development. The scholar cites series of research initiatives in the field of communication and development and concludes that dominant paradigm did not produce desirable results in the less developed countries since it did not suit the local conditions.
Greenberg et al. (1989:129) examined the network evening news coverage of environmental risk and found that the news coverage of environmental risk reflected certain in-built constraints and limitations. The scholars suggested that news coverage of environmental risk should be strengthened on the basis of proper ideas, inputs and guidelines obtained from the experts.

Ishikawa (1990:152) studied the media-generated minorities in times of natural disasters in Japan and pointed out that mass media in Japan were competent enough to do absolute justice to their role in times of natural disaster management. The scholar also noted that organizational commitment and individual volunteerism contributed notably towards efficient coverage of natural disasters by the mass media in the study area.

Rogers (1990:269) evaluated the role of mass media in natural disaster management and reported that mass media had accorded a high priority for the coverage of natural disasters as a matter of human interest story. The scholar also noted that mass media should be equipped with specialists and advanced strategies in order to standardize the quality of natural disaster management communication in modern society.

Stallings (1990:319) assessed the media discourse and the social construction of risk and observed that media had not achieved commendable success in the systematic social construction of risk due to several factors. The scholar also pointed out that media should be enabled to construct the social risk on the basis of systematic research and development endeavors in modern society.

Wilkins and Patterson (1990:364) analyzed the coverage of slow onset hazards as rapidly developing news and noted that contemporary mass media were primarily governed by market forces and business considerations. The scholars also noted that mass media and other informal institutions of learning should play a crucial role in sensitizing various stakeholders of natural disaster management on the basis of expert analysis and guidance.

Burkhardt (1991:49) examined the media, emergency warning and citizen response and found that broadcast media played a crucial role in facilitating emergency warning in times of natural disasters. The scholar also observed that print
media played a major role in providing in depth analysis and relevant suggestions and guidelines for sound management of natural disasters.

Burkhart (1991:51) studied the perceptions of social responsibility of media in times of natural disaster management and pointed out that mass media played a responsible role in the process of natural disaster management in the study area. The scholar also suggested that media should be equipped well to play an effective role in local emergency planning on the basis of proper inputs, guidelines and strategies.

Daley and O’Neil (1991:78) evaluated the press coverage of the Exxon Valdez Oil Spill and reported that the press played a responsible role in creating awareness among the various stakeholders with respect to crisis management which was man made by nature. The scholars also suggested that press should play a responsive and responsible role as angel guardian of public interest in times of natural disasters and manmade crisis.

Faupel et.al. (1991:100) assessed the role of local media in defining hazardous waste as a social problem. The scholars observed that hazardous waste was the outcome of improper development carried out by the irresponsible policy makers and officials. The scholars also noted that people were highly indifferent towards such problem created by the vested interest. The study suggested that media should play a vital role in the prevention of such pollution and hazard in contemporary society.

McCallum et. al. (1991:201) analyzed the role of communication in times of environmental risk and noted that the public’s used the communication services which were quite useful to them. The study revealed that communications media had not developed adequate resources and services for effective coverage of environmental risk.

Nohrstedt (1991:230) examined the information crisis in Sweden after Chernobyl and found that information crisis prevailed in Sweden after Chernobyl event which paved the way for systematic coverage of disasters by the media. The study revealed that media did not develop adequate manpower that was specialized in the art of environmental reporting.
Hayes (1991:141) studied the role of television in times of natural disaster and pointed out that the tragedy was highlighted by the television channels after the occurrence of disaster. The scholar also noted that television had not played a responsible role in the facilitation of natural disaster management on the basis of sound ethical considerations.

Seydlitz et.al. (1991:292) evaluated the effects of newspaper reports on the public's response to a natural hazard event and reported that newspaper reports brought about new awareness and preparedness among the policy makers and people with respect to natural disaster management. The scholars suggested that newspapers should educate the various stakeholders of natural disaster management by providing thought provoking and practically relevant suggestions and guidelines.

Shearer (1991:295) assessed the survivors and the media and observed that communications media reported the causes and consequences of natural disasters in detail. The study revealed that media did not play a responsible role in the rehabilitation of the aggrieved persons in times of natural disaster. The scholar suggested that media should focus the attention of policy makers and executives on the meaningful and timely rehabilitation of the survivors and affected persons.

Mileti and O’Brein (1992:210) analyzed the warning during disaster and noted that radio and new media played a notable role in sensitizing the various stakeholders of natural disaster management when compared to print and other broadcasting channels of communication in the study area. The scholars suggested that radio broadcasting services and new media technologies should be utilized properly in times of natural disaster management.

Scanlon (1992:288) examined the disaster preparedness, some myths and misconceptions easing old and found that media had not played a decisive role in facilitating suitable preparedness among the authorities and common people in times of natural disasters. The scholar suggested that adequate preparedness in times of natural disaster would prevent greater loss of lives and properties.

Smith (1992:311) studied the news coverage of the Yellowstone Forest Fires and pointed out that media provided adequate coverage regarding the forest fire incident. The study revealed that media did not succeed notably in facilitating the
prevention of forest fire which occurred due to the lethargy of the officials and local residents. The scholar suggested that adequate preparations would mitigate such disasters and save the natural resources.

Lewis (1993:187) evaluated the media representations of sustainable development and reported that communications media sustained the status quo since they were under state and private monopoly. The study identified the drawbacks of media support for sustainable development and suggested certain strategies for the improvement of media intervention for sustainable development.

Benthall (1993:34) assessed the disasters, relief and the media in New York and observed that media and government agencies had not achieved meaningful coordination in order to prevent the natural disasters in the study area. The scholar also noted that media had not facilitated responsible relief measures through proper public opinion building intellectual exercises.

Farley (1993:99) analyzed the public, media and institutional responses to the Ibsen browning earthquake prediction and noted that official agencies and media institutions did not play a crucial role in the prediction of earthquake and rehabilitation of the affected persons in the study area. The scholar suggested that government agencies should make use of the media institutions to facilitate meaningful rehabilitation of the aggrieved persons in times of natural disasters.

Krug (1993:176) examined the role of media in the prediction of Arkansas earthquake and found that media and other government agencies had not played a responsible role either in the prediction of earthquake or in the rehabilitation of the affected persons. The scholar suggested that media, government and non-government organizations should play a pro-active role in times of natural disaster management and come to the rescue of people on the basis of social commitment and professional competence.

Shipman et.al. (1993:298) studied the newspaper coverage of Ibsen Brownian’s New Madrid fault earthquake prediction and pointed out that news media had not played a major role in facilitating suitable precautionary measures in times of earthquake in the study area. The scholars suggested that government
departments should be well equipped with adequate and scientific precautionary measures in order to mitigate the harmful effects of earthquake.

Deppa et al. (1994:85) evaluated the role of media in disaster management with reference to Pam Am 103, New York and reported that media institutions were not utilized properly by the stakeholders of natural disaster management. The scholars further noted that media should be motivated and persuaded to facilitate better coverage and rehabilitation programmes in times of natural disasters.

Fischer and Harr (1994:105) assessed the emergency operating centre response to media blame assignation and observed that government agencies had not lived up to the expectations of the people in terms of developing suitable preventive measures and post-natural disaster related operations management. The scholars suggested that government agencies should make use of the media to predict, prevent and manage natural disasters on the basis of systematic planning and coordination.

Friedman (1994:112) analyzed the media, risk assessment and numbers and noted that communications media had not facilitated systematic risk assessment and management of rehabilitation measures in times of natural disasters. The scholar suggested that government organizations and media institutions should work together and enable the people to enjoy the benefits of rehabilitation.

Gaillard and Mercer (1994:115) examined the process of natural disaster management and found certain gaps from knowledge to action. The scholars noted that knowledge of the authorities and people was not enhanced by the formal and informal agencies with respect to natural disaster management. The scholars suggested that appropriate measures should be taken by the government, non-government and media agencies to bridge the gaps in disaster risk reduction.

James (1994:155) studied the communication model for development which emphasizes the need for facilitating communication within rural and marginal communities. The scholar pointed out the parameters and practices of participatory communication and development in general and suggested suitable measures for the effective implementation of development projects on the basis of participatory communication approaches.
James (1994:155) evaluated the facilitating communication within rural and marginal communities in times of natural disasters and reported that marginal communities were not enabled by the media to cope with the natural disasters and obtain suitable relief measures. The scholar also pointed out that the administrators, activists and common masses in the rural areas should work together for better rehabilitation of the affected persons in times of natural disasters.

Kone and Mullet (1994:171) assessed the societal risk perception and media coverage in times of natural disaster management and observed that media did not play a major role in facilitating meaningful societal risk perception and constructive participation of people in the process of natural disaster management. The scholars suggested that media should facilitate better management of natural disasters on the basis of proper training and orientation in times of need.

Lanouette (1994:183) analyzed the news coverage of natural disaster management with respect to print media and noted that print media played a responsible role in the process of natural disaster management in the study area. The scholar also observed that government agencies and non-government organizations had not enlisted active participation of media either to prevent or to facilitate meaningful natural disaster management in the study area.

Payne (1994:241) examined the role of press in the prevention and management of natural disasters and found that press had not played a decisive role either in the prevention or management of natural disasters due to absence of trained manpower and adequate technical facilities. The scholar suggested that press should play the role of angel guardian of public interest in times of natural disasters and prevail upon the government bodies to carry out natural disaster management activities with concern and responsibility.

Quarantelli (1994:251) studied twenty criteria for evaluating disaster planning and managing their applicability in developing societies. The scholar pointed out that disaster management was carried out on the basis of scientific criteria and systematic approaches in the developed countries. The scholar suggested that developing nations had not developed adequate expertise in the successful management of natural disasters due to lack of political commitment and social mobilization.
Sandman (1994:278) evaluated the role of mass media in relation to environmental risk and reported that mass media glorified the occurrence of natural disasters but failed miserably in the honorable rehabilitation of the affected individuals or communities. The scholar also presented 7 basic principles concerning the role of mass media in times of natural disaster for the enhancement of professional excellence and responsibility.

Seydlitz et. al. (1994:291) assessed the media presentations of a hazard event and the public's response and observed that media presented useful reports and analyses about natural disasters. The scholars also noted that media coverage of natural disasters had not brought about adequate public awareness and participation in the process of natural disaster management in the study area.

Singer and Endreny (1994:303) analyzed the portrayal of accidents, diseases, disasters and other hazards and noted that mass media covered such issues since they were known for human interest angle. The scholars reported that human interest stories commanded the attention of the people and enhanced the news value of the media of communication. The scholars suggested that positive and constructive portrayal of natural disasters would facilitate meaningful management of disasters on the basis of useful ideas and guidelines.

Stallings (1994:318) examined the hindsight, organizational routines and media risk coverage and found that mass media were not properly utilized by the government agencies in times of natural disaster management. The scholar suggested that media risk coverage and organizational routines should be enriched on the basis of facts, guidelines and responsible media coverage.

Barakat and Ward (1995:26) studied the methods of how western media and NGOs misrepresented the disasters story and pointed out that media institutions and non-government organizations indulged in the vilification of government bodies due to in built prejudice. The scholars also pointed out that government organizations, non-government organizations and media institutions failed to achieve absolute coordination for effective management of natural disasters.

Flichy (1995:107) evaluated the dynamics of modern communication technologies and tools in times of peace and crisis. The scholar reported that NCTs
have created a new generation of information literates and facilitated active transfer of knowledge, expertise and technology from the privileged areas to underprivileged areas. The study emphasizes that adoption of NCTs was inevitable in modern society in order to facilitate active participation of the people in the processes of crisis management, natural resources management and nation building.

Freeman (1995:110) assessed the relationship between information highways and social change. The scholar observed that information highways brought about widespread social change all over the world. The new communication technologies have created development friendly environment and facilitated social change, social modernization, crisis management, natural disaster management and social development according to the study.

Gross and Mileti (1995:130) analyzed the role of media in early warning with respect to natural disasters and noted that mass media were not fully equipped and committed for meeting the challenge of natural disaster management in the study area. The scholars noted that government departments should develop adequate mechanisms for timely prediction of natural disasters and make use of media institutions to facilitate active participation of people in the process of natural disaster management.

Perry (1995:242) examined the role of media in facilitating early warning in times of natural disasters and found that media institutions were not properly involved by the government organizations to facilitate suitable early warning in the study area. The scholar suggested that government bodies should develop adequate early warning systems and make use of media organizations to alert people and prevent greater loss of lives and resources.

Ploughman (1995:248) studied the American print news media 'construction' of five natural disasters and pointed out that print media in America had not achieved notable success in providing judicious coverage of natural disasters. The scholar suggested that media institutions should develop adequate manpower and equip themselves with suitable instruments for the responsible management of natural disasters.
Rodrique and Rovai (1995:267) evaluated the Northridge earthquake in terms of differential geographies of damage, media attention and recovery. The scholars reported that media had not played a crucial role in the prediction and management of the earthquake due to absence of technological and institutional preparations. The scholars suggested that media should be encouraged to play a responsible role on the basis of systematic preparation and organization in times of natural disasters.

Salwen (1995:276) assessed the news of hurricane Andrew and the agenda of sources and observed that the sources of formal and informal natural disaster education and management were not fully equipped to firmly deal with the natural disaster like hurricane Andrew. The scholar suggested that the sources of communication and management should be guided by the spirit of enlightened consciousness in order to do absolute justice to their role in times of natural disaster management.

Showalter (1995:300) analyzed the newspaper’s coverage of the 1990 earthquake prediction and noted that print media had not predicted the earthquake concerned on the basis of scientific assessment and fact finding exercises. The scholar also noted that print media had not recruited adequate specialists in the reporting of natural disasters to facilitate meaningful report and post-operative care in the study area.

Cadag and Gaillard (1996:54) examined the need for integrating knowledge and actions in disaster risk reduction and found that authority and people were not well educated and prepared in the art of natural disaster risk reduction. The scholars called upon the authorities to develop the discipline of natural disaster management on the basis of appropriate preventive knowledge management to ensure natural risk reduction. The study also provided a practically relevant participatory mapping for the benefit of scholars, managers and authorities of natural disaster management.

Driscoll and Salween (1996:89) studied the public evaluations of news coverage of Hurricane Andrew and pointed out that news coverage had not satisfied the needs of the people who mattered most from natural disaster management point of view. The scholars also suggested that mass media should provide need based,
problem-specific and situation specific services to mitigate the harmful effects of natural disasters and facilitate responsible management of natural disasters on the basis of active people’s participation.

Fisher (1996:106) evaluated the role of officials in charge of natural disaster management and reported that officials were not fully prepared and equipped to enhance mitigation of adverse effects of natural disasters in the study area. The scholar also observed that government officials should be trained in the arts of natural disaster management and media management in order to facilitate effective management of natural disasters.

Hamilton (1996:137) assessed the endogenous growth and national income and observed that the adoption of dominant paradigm of development had brought about several disorders and threats to the processes of human resources development and natural resources development across the world. The scholar advocated that developing nations should not become centers of exploitation of people and degradation of environment on account of politics of victimization hatched by the market forces which controlled the national economy and polity.

Hamilton (1996:136) analyzed the pollution and pollution abatement in the national accounts and noted that most of the in developing nations blindly followed the western model of development which brought about increasing pollution, degradation of natural resources and natural disasters in the name of development. The scholar suggested that environment friendly and distributive justice oriented new model of development should be adopted in the modern society.

Jokinen (1996:160) examined the role of information society in sustainable development. The study found useful insight into the salient features of information society in general and application of new information technologies in various projects in particular. The scholar states that adoption of ICTs was inevitable in all organizations and projects since they have the inherent capacity for bridging the development gap. The study suggests that the dream of sustainable development can be actualized through wider decentralization and localization of ICTs in urban and rural areas in times of peace, crisis and natural disasters.
Khondker (1996:169) studied the impact of floods in Bangladesh on women and pointed out that government officials and media professionals had not worked together to boost the morale of women in times of floods in the study area. The scholar also observed that women and children were the foremost victims of natural disasters. The study recommended that women-specific media services should be rendered in times of natural disasters to prevent greater inconvenience, injustice and loss.

McKay (1996:204) evaluated the role of newspapers in the management of natural disasters in Australia and reported that mass media had not adopted advanced tools and techniques for reporting natural disasters. The scholar also observed that media were not fully prepared to meet the challenge of natural disaster management on the basis of adequate resources, techniques and technologies.

Nevola (1996:226) assessed the media relations in a disaster management situation and observed that government departments had failed to manage the media institutions in the absence of suitable strategies. The scholar suggested that government organizations should enlist the active participation of media in times of natural disasters to facilitate meaningful remedies and protective measures.

Quarantelli (1996:255) analyzed the role of local mass media in the management of natural disasters in America and noted that media operations were not effective in educating and persuading the various stakeholders of natural disaster management in times of need. The scholar suggested that media should be utilized by the government organizations to sensitize the various stakeholders and enlist their active participation in the process of natural disaster management.

Scanlon (1996:284) examined the disasters, records and disaster research and found that the authorities had not achieved considerable success in the collection of authentic facts, field work, documentation of records and analyses of the situation in times of natural disasters. The scholar also observed that disaster management research had emerged as a new area which benefitted the policy makers and other stakeholders to play a crucial role in the management of natural disasters.

Gibbs and Tanner (1997:118) studied the role of information and communication technologies in the processes of natural disaster management,
inclusive development and sustainable development. The scholars pointed out that ICTs were not harnessed for the purpose of nation building mainly due to lack of political will and economic resources. The study recommended that investment on communication infrastructure development and application of NCTs for development would improve the state of affairs in England.

Hamelink (1997:135) evaluated the role of new information communication technologies in the process of social development and provided a comprehensive understanding of the impact of NCTs on culture, society, economy and other spheres of human life. The scholar reported that ICTs were effective means of natural disaster management across the globe. The report reveals that NCTs are capable of boosting social change and economic development in modern society even though they brought about cultural integration at the cost of local values and interest.

Anderson (1997:09) assessed the media, culture and the environment with reference to natural disasters management. The scholar observed that media institutions had not played a responsible role in the sustainable development including natural disaster management in the study area. The scholar suggested that media institutions should play a pivotal role in the sustainable development of culture, environment and economy of nations.

Gibbs and Tanner (199:118) analyzed the role of information and communication technologies with reference to natural disasters management and noted that advanced communication technologies were highly useful in the prediction, prevention and management of natural disasters across the globe. The scholars suggested that communication system, process and operations should be standardized to facilitate better management of crisis, disasters and development projects.

Guru (1997:134) examined the role of grassroots communication system in Karnataka State and found that grassroots communication system was not developed in order to meet certain challenges such as cultural promotion, disaster management, sustainable development and inclusive development in modern society. The scholar has suggested that grassroots communication system should be developed on the basis of systematic research in order to achieve the goal of integrated rural development in Karnataka State.
Ploughman (1997:249) studied the role of print media in natural disasters management and pointed out that mass media were not properly equipped to meet the challenge of natural disaster management by their bosses who were primarily guided by business considerations. The scholar suggested that mass media should be persuaded by the government bodies to educate, organize and motivate various stakeholders of natural disaster management in modern times.

Simon (1997:301) evaluated the role of television in natural disaster management and reported that television news coverage emphasized the causes and consequences of natural disasters. The scholar also observed that television had not contributed significantly for the effective natural disaster management since it was primarily a medium of infotainment.

Smallman (1997:310) assessed the risk trends in the media on the basis of scientific research endeavor and observed that media did not achieve notable success in facilitating the risk trends on the basis of proper home work in the study area. The scholar also suggested that media should accord high priority for the coverage of natural disasters and develop specialized manpower to do absolute justice to their role in times of need.

Enarson and Morrow (1998:94) analyzed the relationship between gender background and natural disaster management and noted that women were not adequately educated and guided in times of natural disasters due to the existence of gender bias among the media professionals. The scholars suggested that women specific and women oriented coverage of natural disasters would enable the women to develop the spirit of preparedness and contribute significantly towards effective natural disaster management.

Phillips (1998:246) examined the role of media in natural disaster management and found that media had an impact on the various stakeholders of natural disaster management. The study revealed that mass media were also found to have instigated volunteerism among the various stakeholders of natural disaster management. The scholar suggested that media initiatives should be developed on the basis of meaningful research and development activities in order to cope with natural disasters and facilitate active participation of concerned persons in the process of disaster management.
Pitrowski and Armstrong (1998:247) studied the role of media in natural disaster management with special reference to Hurricane Danny and pointed out that mass media provided high priority for the coverage of natural disasters. The scholars noted that mass media should succeed in facilitating effective natural disaster management on the basis of constructive public instruction and active people’s participation.

Smith (1998:312) evaluated the role of television in natural disaster management and reported that television succeeded considerably in providing adequate usual evidence in environmental catastrophe in the study area. The scholar also noted that television did not play a decisive role in the systematic management of natural disaster on the basis of scientific education.

McEntire (1998:202) assessed the need for balancing international approaches to disaster and observed that international approaches would enlighten the local authorities in the effective management of natural disasters. The scholar suggested that various regional and national governments should emulate the success stories in the field of natural disaster management.

Grunt fest and Weber (1998:131) analyzed the role of Internet in natural disaster management and noted that Internet had emerged as a prominent instrument of disaster management. The study revealed that Internet was highly accessible, useful and effective medium of natural disaster management in the study area. The scholars suggested that appropriate decisions should be made by the persons who had gained specialization in natural disaster management and media intervention subjects.

Morales-Gomez and Melesse (1998:211) examined the role of information and communication technology in the process of development with an emphasis on the natural disaster management. The study found that digital divide was not overcome by the policy makers and administrators since there was considerable gap between the urban and rural areas in general and haves and marginalized sections in particular with respect to access and utility of information and communication resources and services. The scholars recommended appropriate strategies for the application of ICTs for crisis management, natural disaster management, participatory communication, social justice and economic development purposes.
Blowers (1999:41) studied the need for ecological modernization in modern society and pointed out that the national government and other agencies had not developed necessary mechanisms for achieving the goal of ecological modernization. The scholar also provided certain norms and guidelines for ecological modernization in the study area.

Goudie and King (1999:127) evaluated the cyclone surge and community preparedness in Australia and reported that government and community were not fully equipped and prepared to manage the natural disaster like cyclone on the basis of practically relevant thoughts and deeds. The scholars also noted that mass media, research institutions and development organizations had not achieved meaningful coordination in facilitating community preparedness for effective prevention and management of natural disasters.

Heeks (1999:143) assessed the role of information and communication technologies, poverty and development which revealed the need for creation of informed citizenry and development-friendly climate in modern society. The scholar observed that ICTs have the power to bridge the development gap and facilitate people-friendly development on the basis of round the clock information support and interactive development support communication services. The scholar suggested that systematic application of ICT would facilitate effective management of natural disasters and other development endeavors.

Wilkinson (1999:365) analyzed the role of media in natural disaster management and noted that mass media had played a significant role in the formation of public opinion about the management of natural disasters by the government and other agencies. The scholar suggested that mass media, non-government organizations and government institutions should work together to facilitate effective management of natural disasters.

Jemphrey et. al. (2000:157) examined the role of media in natural disaster management and found that the print media played a significant role in the process of social mobilization in times of natural disasters. The scholars also noted that print media provided responsible reports and analysis which opened the eyes of policy makers and other stakeholders of natural disaster management.
Markus et. al. (2000:195) studied the role of media in natural disaster management with special reference to Third Millennium and pointed out that mass media had not facilitated systematic damage assessment and rescue planning in Kowalski. The scholars suggested that natural disaster management process should be strengthened on the basis of scientific research and systematic media coverage in modern times.

Quarantelli (2000:254) evaluated the disaster planning, emergency management and civil protection and reported that civil protection systems and organizations were seriously challenged by natural disasters. The study revealed that continued improvements in natural disaster planning and management were required in the new millennium since the occurrence of natural disaster affects the tendency for civil protection to be completely accepted as almost exclusively a prime governmental responsibility.

Mathew (2000:197) assessed the need for development communication which contains meaningful comparison of old and new paradigms of communication and development. The scholar observed that old paradigm benefited the western countries while the new paradigm was helpful to the developing countries due to their inherent characteristics. The study provides a very useful insight into the theory and practice of development communication with a focus on cultural promotion, natural disaster management, sustainable development, environment protection and other vital areas of national development.

Ball–Rokeach and Hoyt (2001:24) analyzed the relationship between new media and community development and noted that new media penetration was not satisfactory in the rural areas. The scholars advocated that new media literacy programmes should be organized in the rural areas in order to enable the beneficiaries of various development programmes to make use of the opportunities. The study also highlighted the significance of new media intervention for sustainable development and natural disaster management.

Baur et.al. (2001:29) examined the role of media in natural disaster management and found that government organizations and media institutions did not achieve notable progress in facilitating meaningful counter measures for existing
fragile buildings in times of earthquakes. The scholars suggested that operations research and media intervention programmes were essential to meet the challenge of natural disaster management in modern times.

Harris (2001:140) studied the basic principles of sustainable development including natural disaster management and contributed a meaningful encyclopedia of life support systems. The scholar also pointed out a scientific perspective for achieving the goal of sustainable development with an emphasis on prevention and management of natural disasters.

Mowlana (2001:214) evaluated the role of ICTs in development with special reference to the Arab world and noted that ICTs were accessible to the people as effective instruments of development in the region concerned. The study also reported that media institutions were actively involved in the process of natural disaster management in the region concerned. The scholar suggested that infrastructure development, trained manpower, greater access and user-friendly ICTs would enhance the status of development of the people in the Arab region.

Paul (2001:240) assessed the role of Internet in interactive disaster communication on the basis of systematic content analysis of 64 disaster relief home pages. The scholar observed that Internet facilitated immediate early warning, precautionary measures and quick relief operations in the affected areas in times of natural disaster. The scholar suggested that new media intervention should be improved on the basis of systematic evaluation for natural disaster management.

Scanlon (2001:285) analyzed the role of media in natural disaster management from research point of view and noted that the process of natural disaster management was not developed on the basis of systematic and scientific research. The scholar suggested that natural disaster management and media intervention strategies should be developed on the basis of systematic fact finding and analysis.

Best and Maclay (2002:37) examined the nature and extent of community Internet access in rural areas which could solve the economic sustainability puzzle in India. The work found the need and importance of community based Internet services which could provide interactive information and communication benefits to
the masses in the rural areas in times of crisis, disasters and other situations. The authors conclude that information and communication technologies should become an essential form of infrastructure necessary to the process of natural disaster management which is an important component of integrated grassroots development in India.

Brandon (2002:44) studied the need and importance of disaster communications and information systems and pointed out that space communication had emerged as the most effective instrument of natural disaster management in modern times. The scholar suggested that a new discipline called disaster communication should be designed in consultation with the experts by the universities and media institutions in order to facilitate effective management of natural disasters.

Burns (2002:52) evaluated the nature and significance of emergency management and reported that national governments all over the world should be strengthened properly on the basis of suitable research and development initiatives. The scholar also noted that educational institutions, media organizations, research institutions and development organizations should function together and facilitate meaningful management of natural disasters by enlisting the active support of various people.

Carroll (2002:61) assessed the need and importance of sustainable development and observed that development projects were not implemented on the basis of ground realities and meaningful understanding of ecological perspective of development. The scholar suggested that the goal of sustainable development should be achieved on the basis of scientific natural disaster management in modern society.

Daly (2002:79) analyzed the principles and policies of sustainable development with reference to certain policy implications and noted that natural resources should be kept intact in order to safeguard the interest of future generations. The scholar further noted that various stakeholders of sustainable development should promote national and international policies that charge adequately for resource rents, in order to limit the scale of the macro economy relative to the ecosystem and to provide revenue for public purposes.
Ekins (2002:93) examined the nature and scope of environmental economics and found that authorities did not properly understand the significance of environmental sustainability. The scholar provided certain ideas and guidelines for effective attainment of the goal of sustainable development through systematic natural disaster management in modern times.

Martin (2002:196) studied the disaster management concepts and pointed out that these concepts were implemented successfully in several developed countries. The study has proposed that they are also relevant in developing countries, although the issue of poverty alleviation must be considered when interpreting the concepts. The scholar suggested that poverty alleviation should always be the top priority, but disaster management planning within the economic constraints of developing countries would greatly reduce the extra burden caused by disasters.

Pangi (2002:236) evaluated the significance of consequence management including natural disaster management with special reference to the 1995 SARIN Attacks on the Japanese Subway System. The scholar reported that mass media facilitated effective consequence management on the basis of social commitment and professional excellence. The scholar suggested that new branch of natural disaster management should be developed on the basis of appropriate research and media intervention strategies in modern times.

Scanlon (2002:286) assessed the role of media in mass emergencies and disasters and observed that mass media rendered memorable and timely help to the victims of September 11 disaster in America. The scholar suggested that mass media, government organizations, non-government organizations and other agencies should be well equipped with necessary facilities to cope with certain disasters in modern times.

UNICEF (2002:339) analyzed the role of media in disaster management and noted that effective natural disaster management primarily depended on systematic media intervention and social mobilization activities in modern times. The study also noted that natural disaster management should be developed as a systematic discipline across the world in order to facilitate active participation of various stakeholders of natural disaster management.
Ahiabenu (2003:05) examined the public-private partnership for ICT development in Ghana and found that public-private participation and partnership strengthened the process of participatory communication in times of crisis management, disaster management and project management. The scholar also pointed out that meaningful application ICTs would strengthen the development process and facilitate active participation of people in the process of sustainable development in modern society.

Cardona (2003:56) studied the role of government, NGOs, media and other agencies in natural disaster management and pointed out that scientific indicators for risk measurement were not developed by the authorities concerned. The scholar also focused the attention of various stakeholders of natural disaster management on the relevance of appropriate methodological fundamentals for effective natural disaster management.

Clarke (2003:71) evaluated the need for developing capacities for ICT enabled development and reported that development policies are crucial in guiding and laying the foundation on which the new media can bring about participatory development at the grassroots level. The scholar suggested that new media including the Internet should be harnessed by the government, private organizations and media institutions to facilitate effective management of natural disasters in urban and rural areas.

Cutter (2003:77) assessed the role of science and technology in the management of natural disasters and observed that GI science had developed over a period of time as an effective instrument of emergency management in modern society. The scholar also observed that scientific perspective of natural disaster management should emerge on the basis of series of systematic research endeavors. The scholar suggested that media institutions should be actively involved in the diffusion of knowledge and expertise on various dimensions of natural disaster management.

Devraj and Chaturvedi (2003:86) analyzed the role of Internet in the transfer agricultural technology and natural disaster management and noted that Internet had emerged as the most effective instrument of natural disaster management and
agricultural promotion in modern times. The scholars suggested that Internet should be utilized systematically to transfer agricultural technologies and manage natural disaster in modern society.

Few (2003:103) examined the vulnerability and coping strategies with special reference to natural disaster management in the modern times. The scholar also primarily dealt with the local responses to a global threat and called upon the local authorities to remain prepared with necessary precautionary measures to manage the natural disasters which are caused by series of activities in the name of development.

Kratzer et.al. (2003:173) studied the role of print media in natural disaster management and found that newspapers published highly disturbing photographs which adversely affected the morale of people. The study also suggested that print media should follow sound ethical norms and professional guidelines while covering disasters in order to protect public interest.

Wisner (2003:366) evaluated the development and disaster vulnerability in the post-Johannesburg world and reported that disaster vulnerability had increased in the study area mainly due to irresponsible media coverage. The scholar also noted that media should not bring about sustainable suffering by following unethical practices with respect to coverage of disasters in modern times.

Bullock et. al. (2004:47) assessed the role of communication in disaster management in America and observed that American media had played a significant role in the public opinion formation and social mobilization processes through systematic coverage of issues, trends and developments. The study also reported that mass media should play a highly responsible role as facilitators of judicious media comments and criticisms.

Fiedrich and Gehbauer (2004:104) analyzed the HLA-based distributed simulation system for disaster response activities after strong earthquakes. The scholars noted that mass media and non-government organizations had played a responsible role in the management of natural disasters. The scholars also suggested that media intervention for natural disaster management should be strengthened on the basis of scientific evaluation and pro-active measures.
Samarajiva (2004:277) examined the significance of mobilizing information and communications technologies for effective disaster warning on the basis of certain lessons from the 2004 tsunami in Sri Lanka. The scholar found that new communication technologies were highly effective tools of social mobilization in times of natural disasters in modern times. The scholar suggested that media intervention strategies should be developed on the basis of scientific evaluation.

Cardona (2005:57) studied the indicators of disaster risk and risk management and pointed out that scientific indicators of disaster management would facilitate effective problem solving exercises in modern society. The scholar suggested that natural disaster management process should be developed on the basis of scientific indicators and systematic media intervention programmes.

GSM Association (2005:132) evaluated the role of mobiles in disasters and emergencies and reported that mobiles played a highly significant role in the prevention of natural disasters. The study also reported that mobiles were extensively used by the authorities in times of natural disaster management. The study suggested that new media including the mobile should be utilised fully and properly to attain success in the management of natural disasters.

Nanudorn (2005:216) assessed the role of information and communication technologies in narrowing the development gaps between developed urban and rural areas in Thailand. The researchers observed the extent to which ICTs could bridge the gaps in rural and remote areas and extent of empowerment of marginalized sections of society in Thailand. The study revealed that lack of connection across public, private and community sectors and lack of capacity led to the inability to use ICTs in many sectors including natural disaster management.

Nussbaum and Friedrich (2005:232) analyzed the future trends relating to development communication including natural disaster management and sustainable development. The study noted that educational communication and development communication disciplines have evolved over a period of time as prominent branches of human knowledge and advancement. The scholars have suggested that constant and continuous academic deliberations and scientific evaluations would boost the disciplines concerned all over the world.
Annor et.al (2006:11) examined the challenges of infusing information and communication technologies in extension for agriculture and rural development in Ghana. The scholars found those ICTs were effective tools of agriculture and rural development since they provided the benefit of interactive communication to the users. The study has suggested that ICTs should be used as prominent channels of communication to enhance progress in the fields of agriculture and rural economy.

Bureau of Meteorology (2006:48) studied the nature, causes and consequences of Tropical Cyclone Larry and pointed out that adequate expertise was developed by the government to firmly deal with the natural disasters like cyclone. The study also reported that government authorities and media professionals did not achieve commendable success in facilitating joint operations in times of natural disasters.

Koutsouris (2006:172) evaluated the impact of ICTs on rural masses and reported that ICTs emerged as effective instruments of crisis management, natural disaster management, participatory communication and development. The study contains useful details and suggestions about the role of ICTs in the process of sustainable development in modern society. The scholar has strongly advocated the application of ICTs in all fields of rural development in order to enlist active participation of people in nation building activities.

Paton (2006:238) assessed the need and importance of disaster resilience in modern times and observed that modern government and civil societies had understood the importance of scientific management of natural disasters. The scholar also noted that adequate expertise had emerged for efficient management of natural disasters over a period of time on account of series of research and development initiatives. The scholar also provided an integrated approach to the management of natural disasters.

Rattien (2006:263) analyzed the role of the media in hazard mitigation and disaster management and noted that media institutions were not fully equipped with the state of the art facilities and technologies in order to mitigate certain hazards caused by natural disasters. The scholar suggested that the process of natural disaster management should be strengthened on the basis of systematic measures for the mitigation of hazards in modern times.
Tierney et. al. (2006:328) examined the disaster myths, media frames and their consequences in Hurricane Katrina and found that disaster myths had contributed for adverse consequences in relation to Hurricane Katrina. The scholars emphasized that natural disaster management should be enriched on the basis of systematic research rather than disaster myths in modern times.

Vidal (2006:347) studied the collapse of ecosystems in United Kingdom and observed that policy makers and implementers of development projects did not take the ecological perspective seriously. The study pointed out that the failure of the government and industrial houses caused serious setback to the process of sustainable development in modern times. The scholar suggested that eco friendly developmental initiatives would prevent the natural disasters and facilitate sustainable development in modern society.

White House (2006:358) evaluated the federal response to Hurricane Katrina in America and reported that administrators had failed to predict the occurrence of Katrina Hurricane which caused severe loss to the economy of the nation. The study also reported that adequate precautionary measures were not taken by the authorities and other agencies involved in the management of natural disasters.

Yang (2006:378) assessed the impact of Hurricanes on international financial flows and observed that Hurricanes had a demoralizing effect on the international economy. The scholar advocated the need for developing a scientific design for the assessment of the adverse implications of natural disasters and media intervention programmes based on authentic data and expert consultation.

Ashlinand and Landle (2007:13) analyzed the role of print media in natural disaster management with reference to post-tsunami environmental discourse. The scholars noted that print media played a responsible role in the post-tsunami environmental discourse and facilitated active social mobilization on the basis of constructive reporting and analysis.

Attz and Samuel (2007:17) examined the process of natural disaster management in Central America and the Caribbean and found that mass media had not played a crucial role in the systematic management of natural disasters in the absence of proper planning and coordination activities. The scholars suggested that
media institutions should be sensitized by the intellectuals and researchers in order to play a pro-active role in times of natural disasters.

Chen (2007:67) studied the practice of earthquake prediction in China and pointed out that tested and tried methods were designed in China to predict the earthquake and facilitate timely action. The scholar also suggested that government authorities, media professionals and social educators should function together for effective management of natural disasters like earthquake through proper coordination and execution of activities.

Darrell and Orr (2007:80) evaluated the factors such as race, gender and communications in natural disasters and reported that demographic features had significant association with the management of natural disasters. The scholars also pointed out that communications media had played a responsible role in times of natural disaster management by providing timely and relevant information support to the authorities.

Goodchild (2007:123) assessed the role of citizens as sensors with special reference to natural disaster management and observed that the world of volunteered geography had grown commendably over a period of time. The scholar called upon the authorities to ensure meaningful public – private partnership in times of natural disaster management.

Gordon (2007:125) analyzed the mobile phone and the public sphere with reference to three critical situations and noted that advanced communication tools and technologies including mobile phone had played a major role in the management of natural disasters. The scholar suggested that in the age of media convergence the authorities should intelligently make use of multimedia for effective management of natural disasters.

Littlefield and Quenette (2007:190) examined the role of media in natural disaster management with special reference to Hurricane Katrina in America. The scholars found that the portrayal of authority by the media in times of natural disaster was positive and critical. The scholars suggested that leaders should be sensitized to play a crucial role in the process of natural disaster management on the basis of constructive ideas and guidelines by the media and other agencies.
National Research Council (2007:220) studied the need for improving geospatial support for disaster management in America and pointed out that authorities had achieved notable success in enlisting active geospatial support for natural disaster management. The report also suggested that policy makers, administrators, scientists, technocrats, activists and communicators should work together and enhance the status of natural disaster management.

Perry (2007:244) evaluated the role of media in natural disaster management with reference to Mauritius and reported that media had not succeeded considerably in sensitizing the various players in times of Tsunami. The study also reported that media should play a crucial role as early warning system and facilitators of effective management of natural disasters on the basis of constructive orientation and guidance.

Sherbinin et.al. (2007:296) assessed the vulnerability of global cities to climate hazards, environment and urbanization. The scholars observed that unscientific urban development process in various countries had brought about increasing vulnerability to climate hazards across the world. The scholars suggested that uncontrolled urbanization should be checked in order to facilitate better management of natural disasters through systematic media education and social mobilization programmes in modern times.

UNESCO (2007:338) analyzed the natural disaster preparedness and education for sustainable development in the new millennium and noted that many countries were not fully equipped and prepared with suitable preventive measures for effective natural disaster management. The study also emphasized the need for scientific natural disaster preparedness and education for sustainable development on the basis of systematic research and development endeavors.

Attzs (2008:18) examined the linkages between poverty and disaster vulnerability in the context of remittance flows to households in the Caribbean, Jamaica. The scholar primarily dealt with the channels through which natural disasters and remittances affected each other but also reviewed the distribution of female-headed households in Jamaica as a percentage of households living below the poverty line. The scholar found whether flows of remittances alleviated the post-
disaster living conditions of such households. The scholar suggested that various stakeholders of natural disaster management should come to the rescue of the poor people who experienced the loss of livelihoods caused by natural disasters.

Chenq (2008:68) studied the earthquake prediction in China and pointed out that China had achieved commendable success in designing appropriate methods for timely prediction of earthquakes. The scholar also noted that the process of natural disaster management was developed on the basis of competent manpower, relevant technologies and useful initiatives in China.

Godara (2008:119) evaluated the relationship between the risk assessment and management in pervasive computing on the basis of certain operational, legal, ethical, and financial perspectives. The scholar reported that integrated perspectives and approaches were required for effective management of natural disasters in modern times since several factors and forces caused such disasters.

Lips and Gong (2008:189) assessed the use of new media in natural disaster management with reference to Hurricane Katrina and observed that there were considerable changes of existing institutional arrangements, including the introduction of new legislation, changes to governance structures and leadership of government agencies, and the introduction of new information systems. The study also suggested that ICT-enabled forms of information sharing and collaboration was highly essential to manage the natural disaster in modern society.

Luber (2008:192) analyzed the climate change and extreme heat events in America and noted that climate change and extreme heat were the consequences of anti ecological development projects launched in modern society. The scholar also noted that development was achieved in America at the cost of environment and public interest. The scholar suggested that eco-friendly approaches to national development were required to minimize natural disasters and loss of lives and properties in modern society.

Munodawafa (2008:215) examined the role of telecommunications and ICTs in disaster management with reference to Zambia and found that ICTs had become very effective instruments of natural disaster management in modern times. The
A scholar explored new possibilities of harnessing the ICTs for sustainable development including natural disaster management in Zambia.

Qureshi (2008:256) studied the role of information and communication technologies in sustainable development and pointed out that new media had become prominent instruments of crisis management, disaster management and sustainable development over a period of time because of their inherent characteristics and capabilities. The scholar suggested that new media should be systematically used for effective management of natural disasters in modern times.

Agena (2009:04) evaluated the use of web 2.0 tools for sustainable agriculture in Uganda and reported that awareness and application of web 2.0 tools to their agricultural practices was minimal. The study pointed out that Citizen Journalism in Africa project facilitated the capacity building of civil society organizations to use online and offline citizen journalism as a means of publication, lobbying, networking and knowledge sharing. The scholars as provided certain strategies for effective use of social networking tools in order to enrich the processes of natural disaster management, agricultural development and sustainable development.

Baron and Philbin (2009:28) assessed the role of social media in the process of crisis management and observed that social media had broken all barriers to communication and participation in times of crisis. The scholars suggested that social media should be utilized properly for effective management of all kinds of crises in modern society in a democratic way.

Coppola (2009:75) analyzed the importance of international disaster management studies with reference to the practice of emergency management as they pertained to municipalities within the United States. The scholar noted that curricula tended to be limited to the development and practice of the emergency management discipline at the domestic level. The scholar argued that such a bias should be abandoned so that students and practitioners in the United States may benefit from the rest of the world’s experience in emergency and disaster management.
Jerling (2009:158) examined the mobile devices in rural Africa which are used to deliver multiple public and private sector services in the rural community. The study touches upon the technology solution used and the challenges facing the service providers in rural areas with respect to agriculture development, natural disaster management and community development. The scholar has suggested that the challenge of reaching out to rural Africa could be addressed by combining a unique combination of social enterprise and entrepreneurship to build a deep rural service network that cooperates with government and private sector.

Joyce et. al. (2009:163) studied the role of satellite communication in natural disaster management on the basis of an extensive review of the status of satellite remote sensing and image processing techniques for mapping natural hazards and disasters. The scholars found that satellite communication resources and services were absolutely essential component of natural disaster management in modern times. The scholars suggested that new media should be used systematically to boost sustainable development in modern society.

Malone (2009:194) evaluated role of new media as tools of natural disaster management, agricultural development and decentralized development in the study area. The scholar reported that production of media materials should be undertaken on the basis of the needs of agriculture development staff and media professionals. The scholars suggests that mobile phone companies, banks, NGOs and international agencies should be actively involved in the planning and preparation of media materials which would boost sustainable development in the new millennium.

Motsou (2009:213) assessed the media treatment of agricultural and rural development issues, challenges and problems with reference to Cameroon and observed that media have a social obligation to disseminate information that can help the rural population increase agricultural and animal production. The study suggests that media must provide adequate space and time to the experts to share their expertise on the various aspects of natural disaster management, agricultural development and sustainable development in modern times.

Nellemann et.al. (2009:225) analyzed the environmental food crisis and noted that the processes of urbanization, industrialization etc had taken away the
most fertile land of the farmers and caused serious food crisis across the globe. The scholars also noted that eco-friendly developmental initiatives were primarily required to mitigate natural disasters including food crisis in the new millennium.

Noy (2009:231) examined the macro economic consequences of disasters and found that natural disasters occurred mainly because of inadequate precautionary measures at the international, national and regional levels across the globe. The study also reported that most developed nations were primarily responsible for the increasing degradation of the natural resources and occurrence of natural disasters. The scholar suggested that locally relevant precautionary measures would prevent the natural disasters and safeguard the local environment.

Ulakai (2009:334) studied the challenges journalists have identified when trying to provide coverage on agriculture and rural development projects in Tonga. The authors have pointed to the need for resource sharing when sourcing information, particularly when either party is unable to reach a remote or isolated area. The work deals with the need for scientific sources to work with journalists on simplifying information, creating awareness on the importance of agriculture and rural development among the journalists in the region and creating understanding of the media in the agriculture sector.

Vos (2009:349) evaluated the role of print and electronic media with reference to agriculture and rural development in Africa. The scholar reported that print and electronic media are complementary but their effectiveness varies with the audience and purpose. The study reveals that multi-media services are useful in promoting research outputs and training, and creating awareness among various stakeholders about natural resources management, natural disaster management, agricultural development and sustainable development in the rural areas.

World Bank (2009:370) assessed the costs, benefits and institutions of disaster risk reduction in developing countries and observed that most of the developing nations had not achieved desirable success in the prevention of natural disasters because of wrong emulation of western models of development. The report suggested that local governments should develop appropriate system and adopt suitable initiatives to prevent the natural disasters and safeguard the people.
Adkins (2010:02) analyzed the organizational networks in disaster response with reference to US government network’s efforts in hurricane Katrina. The study noted that sound organizational networks were not developed to effectively manage the natural disaster like hurricane Katrina. The scholar suggested that national government should develop appropriate network, equip people with skills and enhance the competence of the system of natural disaster management.

Asimakopoulou and Bessis (2010:16) examined the role of ICTs in the management of natural disasters and found that advanced ICTs facilitated timely and adequate flow of information to various agencies in times of natural disaster. The scholars suggested that appropriate collaborative and distributed frameworks, networks and operations for scientific management of natural disasters across the globe.

Bonano et. al. (2010:43) studied the costs of disaster in terms of consequences, risks and resilience in individuals, families and communities. The scholars pointed out that the costs of disaster consequences were not systematically assessed by the policy makers in consultation with the experts. The study suggested that the consequences, risks and resilience in individuals, families and communities should be systematically studied and disseminated by the media for the benefit of people.

Cate (2010:63) evaluated the role of the media in disaster mitigation and reported that media did not play a notable role in the mitigation of natural disasters mainly due to lack of preparedness and resources. The scholar also noted that contemporary media were not properly utilized by the authorities concerned with natural disaster management. The study suggested that systematic media intervention programmes should be designed in consultation with the experts in order to increase the utility of media services.

Cutter (2010:76) assessed the social science perspectives on hazards and vulnerability science and observed that natural disasters could be managed on the basis of scientific and practical ideas and approaches. The scholar also noted that geophysical hazards were not systematically examined by the agencies concerned in order to prevent natural disasters and mitigate the adverse consequences.
Delva and Brown (2010:83) analyzed the role of media in times of Haiti Quake and noted that media played a responsible role in the rehabilitation of the aggrieved persons after the earthquake. The scholars also noted that media glorified the incidence of Haiti Quake due to business considerations and failed to demonstrate corporate social responsibility in the treatment of the subject concerned.

Dupuy (2010:90) examined the role of media in times of earthquake in Haiti and found that the incidence was a wake-up call for the authorities and citizens in the state concerned. The scholar suggested that natural disasters could be effectively managed on the basis of scientific precautions and systematic rehabilitation approaches in modern times.

Federal Emergency Management Agency (2010:101) studied the emergency response action steps in modern times and pointed out that government organisations did not enlist the active participation of research organisations and media institutions to manage the natural disasters by bridging the communication gap between the authorities and people. The study suggested that emergency response action steps should be designed on the basis of scientific research and systematic management initiatives.

Goodchild and Glennon (2010:124) evaluated the crowd sourcing geographic information for disaster response and reported that adequate precautionary measures were developed in modern times to effectively prevent the occurrence of natural disasters. The scholars also noted that developing countries lagged behind the developed nations in evolving suitable mechanisms for effective prevention and management of natural disasters.

Inter-Parliamentary Union (2010:151) assessed the disaster risk reduction which is an effective instrument for achieving the millennium development goals. The study observed that advocacy kit for parliamentarians should be designed and delivered in order to sensitize the parliamentarians on their social obligations and political responsibilities to respect to prevention of natural disasters across the globe. The study also suggested that political activism and social mobilisation were essential for the efficient management of natural resources and prevention of natural disasters in the new millennium.
Li and Good Child (2010:188) analyzed the role of social networks in natural disaster management and noted that social networks had become a promising data source in time-critical situations over a period of time. The scholars observed that social networks could play in the crowd sourcing of geospatial information for emergency management, data generation and dissemination of remedial measures. The scholars called upon the authorities to implement appropriate information systems for emergency management, privacy, and equity internationally.

Meier and Ziemke (2010:206) examined the growth, communications and response and found that communications media and new technologies were effective means for ensuring the mapping of natural disasters. The study suggested that practitioners, scholars and developers should be brought under the common umbrella in order to ensure meaningful prevention and management of natural disasters.

Radio Netherlands (2010:257) studied the role of broadcasting media in natural disaster management and pointed out that radio had emerged as the most effective medium of natural disaster management. The study reported that broadcasting organizations should be actively involved in the process of natural disaster management in modern times.

Crawford (2010) evaluated the use of social media for disaster communications in Taiwan and reported that mobile apps were developed with different demands and created a new approach for interaction and communication in times of natural disasters. The scholar suggested that mobile apps could be used in many ways for disaster communication across the world.

Salman (2010:275) assessed the relationship between ICT, new media and development with reference to Malaysia which is in the forefront in the application of new media tools and technologies for various developmental endeavors. The scholar has observed that new media have the capacity to bridge the communication gap between the authorities of disaster management and beneficiaries of disaster management. The study concludes that new media channels such as electronic mail, WWW, newsgroups, remote access, file transfer, text based and voice based chat and so on provided series of benefits to the people in Malaysia at grassroots level for multi-purposes including natural disaster management and agricultural development.
Scanlon (2010:287) analyzed the relationship between mass media and natural disaster management and noted that media played a critical role before, during and after natural disasters. The scholar also noted that the media were highly essential for warnings in times of natural disasters since they were most important source of public information in the wake of a disaster. The scholar also pointed out that the limited research available suggested many victims and relatives of victims welcome the presence of the media and do not see journalists as intruders.

Sherrieb et. al. (2010:297) examined the need and importance of measuring capacities for community resilience with reference to natural disaster management. The scholars found that network development, community organization and community participation were the pre-requisites to effective management of natural disasters. The scholars suggested that media institutions should be properly utilized by the government organizations to educate, organize, motivate and persuade the various stakeholders of natural disaster management.

United Nations (2010:340) studied the international strategy for disaster reduction and pointed out that many developing nations had not designed appropriate strategy for effective reduction of natural disasters. The study also reported that adequate disaster reduction measures and effective disaster management approaches would facilitate sustainable development in modern times.

Vieweg et.al. (2010:348) evaluated the nature and scope of micro blogging during two natural hazards events and reported that twitter contributed significantly to situational awareness in times of natural disasters. The scholars suggested that social media should be utilized properly to enlist timely and active support of people in the process of natural disaster management.

Asian Disaster Reduction Center (2011:15) assessed the causes and consequences of great east Japan earthquake and observed that increased threats to environment had affected the countries like Japan in modern times. The centre also reported that Japan had developed excellent technologies, human resources and networks to efficiently manage the natural disasters like earthquake. The centre also suggested that media institutions should play a pro-active role in the management of natural disasters.
Badger (2011:19) analyzed the role of social media in natural disaster management and noted that social media had buried the communication gaps between individuals and organizations because of their inherent characteristics and capabilities. The scholar also noted that social media brought about increasing social mobilization and active people’s participation in the process of natural disaster management.

Bengtsson et. al (2011:33) examined the improved response to disasters and outbreaks by tracking population movements with mobile phone network data in Haiti. The scholars found that geospatial studies were carried after the earthquake in order to mitigate the adverse consequences and facilitate effective management of rehabilitation programmes in the post-earthquake period.

Ben-Yehuda (2011:35) studied the role of social media in natural disaster management and pointed out that social media had cut across all barriers to participatory communication in times of natural disasters. The scholar also observed that social media brought about active social mobilization for natural disaster management and enabled the authorities to diffuse the crisis and serve the mankind through timely services.

Computer Science and Telecommunications Board (2011:74) evaluated the relationship between public response to alerts and warnings on mobile devices in times of natural disasters. The study reported that mobile devices were highly effective tools of alerting the people and authorities in times of natural disasters. The study further revealed that mobile devices facilitated effective management of natural disasters as active instruments of participatory communication.

European Commission (2011:97) assessed the drought situations in Kenya, Ethiopia, Somalia and Djibouti and noted that African continent witnessed severe drought on account of anti-ecological developmental initiatives including mining and de-forestation. The study observed that African continent had abundant natural resources which were degraded constantly in the name of development. The study suggested that humanitarian aid and civil protection were absolutely essential to safeguard the interest of people in times of drought.
Mutchler et. al. (2011) conducted an exploratory study on users of smart phone and noted that smart phones included an identity, location and direct payments mechanisms. The study revealed that adoption of social media had increased as companies businesses begun to realize the social media channels which brought about interactive communication all over the globe. The scholars have called upon the users to make use of social media guidelines that can help small business persons and users in the changing marketing scenario.

Freeman (2011:109) analyzed the role of social media in the process of natural disaster management in Australia and noted that micro-blogging facilitated better emergency management practices in times of natural disasters. The study revealed that modern technologies had become an integral part of information transfer for citizens in the geographic region affected by the natural disaster. This case presents the progression of how SNTs had been used during and in the aftermath of natural disasters in Australia between 2009 and 2011. The researcher suggested that social media should be utilized properly in times of natural disaster management for effective social mobilization and participation.

Gall et.al. (2011:116) examined the unsustainable trend of natural hazard losses in the United States and found that anti-ecological and developmental initiatives were primarily responsible for increasing natural hazards in America. The scholars suggested that the process of development should be strengthened on the basis of eco-friendly and people-friendly developmental initiatives in the new millennium.

Goldfine (2011:121) studied the best practices with respect to the use of social media throughout emergency and disaster relief a capstone project in America. The study pointed out that social media had emerged as democratic and development oriented media of communication over a period of time. The scholar suggested that social media should be utilized properly by various stakeholders of natural disaster management in America.

Gorey (2011:126) evaluated the role of social media in natural disaster management and noted that social media had become boon to the mankind for the purpose of natural disaster management. The scholar reported that social media
facilitated interactive communication between the facilitators of natural disaster management and beneficiaries in modern society. The scholar suggested that social media application should be enriched on the basis of scientific evaluation.

Jordan et.al. (2011:161) assessed the state of knowledge with respect to the operational earthquake forecasting and observed that advanced communication technologies had enabled the authorities and people to predict the natural disasters. The scholars also pointed out that advanced technologies were effectively utilized as means of natural disaster management in modern times. The scholars also provided certain practically viable guidelines for utilization of advanced tools, technologies and strategies for effective management of natural disasters.

Latonero and Shklovski (2011:184) analyzed the use of social media by emergency response organizations and noted that twitter was highly effective instrument of natural disaster management. The scholars have contributed notably to the understanding of organizational innovation, risk communication, and technology adoption by emergency management. The study highlighted the importance of the information evangelist within emergency management organizations and detailed the challenges those organizations face engaging with social media and Twitter. The study also provided insights into practices and challenges of new media implementation for crisis and risk management organizations.

Loveland (2011:191) examined the role of social media in natural disaster management and found that social media provided instantaneous communication between the authorities and publics in times of natural disaster management. The study also revealed that social media were immensely useful tools of natural disaster management in modern times.

Nazari et. al. (2011:222) studied the role of broadcasting in the management of natural disasters in Malaysia and pointed out that in case of socio-political crisis or natural disasters media not only played their critical role effectively especially educational and informing level but level a memorable and historical effect doing their functions. The study revealed that radio was a unique media in natural disasters mainly in spreading news about occurrence of disasters and its side effects at the first stage. The scholars also noted that television played the most important role in
the second stage by showing people how to react and survive in times of natural disasters. The scholars suggested that media institutions were required to evaluate their reporting about natural hazards and disaster preparedness and to cooperate with disaster mitigation organisations where appropriate to improve the preciseness, accuracy and quality of such reporting.

Nguyen (2011:227) evaluated the role of social media in natural disaster management and reported that social media lived up to the expectations of people from the point of view of effective management of natural disasters. The study also reported that social media struggled to keep with the changing expectations of various stakeholders of natural disaster management.

Gertner (2011) examined the effects of multimedia technology on learning and management aspects of human life and noted that there were more negative implications of using e-text. The scholar observed a positive relationship between learning and reading on an e-text transfers scores when compared to traditional text. The scholar suggested that future researchers should assess the features and applications of e-text which allow for social interactions in times of peace and disasters.

Shinbun (2011) assessed the use of social networking sites in easing communication knots in disaster zones and observed that disasters communications had changed especially with the development of mobile Internet and other devices. The scholar suggested that user experience of mobile search should be improved for persuading people keep using the search services in modern society.

Skinner (2011:309) analyzed the role of twitter in the management of natural disasters on the basis of his experience as a content producer on Twitter during wildfires in Colorado, followed by the experience of researching tweets produced during Hurricane Sandy. The study noted that twitter emerged as the most effective instrument of participatory communication in times of natural disaster management. The scholar suggested that twitter should be utilized with proper care and responsibility in modern society in order to ensure meaningful and responsible management of natural disasters.
Velev and Zlateva (2011:345) examined the use of social media in natural disaster management in Bulgaria and found the possibilities for the use of social media in the management of natural disasters. The scholars have also presented a brief overview of natural disasters and analyzed the communication types and the means for their implementation between participants in natural disaster events. The scholars have also provided certain basic guidelines for organizing information exchange by social media in their study.

Banjo (2012:25) studied the use of mobile phones in natural disasters and pointed out that mobile phones played effectively as instrument of natural disaster management. The scholar used the 2010 Haiti earthquake as the start and focal point of research and noted that mobile phones could be part of an effective strategy to manage the risk posed by natural hazards. The study highlighted the advantage of the portability, ease of use and other characteristics of mobile phones.

Berke and Lyles (2012:36) evaluated the planning for resiliency on the basis of systematic evaluation of state hazard mitigation plans under the disaster mitigation act. The scholars reported that hazard mitigation plans were based on systematic assessment of the various factors associated with natural disasters. The scholars suggested that disaster mitigation act paved the way for meaningful management of natural disasters and rehabilitation of the affected persons.

Eiser et.al. (2012:92) assessed the risk interpretation and action with reference to natural hazards on the basis of qualitative research methodology and observed that risks in the context of natural hazards always involved interactions between natural (physical) and human (behavioral) factors. The study revealed that decision-making under conditions of uncertainty was inadequately described by traditional models of 'rational choice'. The scholars suggested that attention needs to be paid to how people’s interpretations of risks are shaped by their own experience, personal feelings and values, cultural beliefs and interpersonal and societal dynamics.

Fraustino et.al. (2012:108) analyzed the use of social media in natural disaster management on the basis of an extensive review of the knowledge base and gaps. The scholars noted that it was essential to understand what was known about
social media use during disasters and what remained to be tested. The scholars suggested that the policy makers and other managers of natural disasters should have an in depth understanding of the disaster and media in order to mitigate the adverse effects on the environment and people in times of natural disasters.

Jayanthi et.al. (2012:156) examined the role of satellite communication in natural disaster management with reference to Southern Malawi and found that satellite communication channels were highly effective in predicting natural disasters and protecting the interest of farmers. The scholars also reported that standardized participation index should be developed on the basis of satellite estimated rainfall to increase agricultural production and productivity in the study area.

Laframboise and Loko (2012:182) studied the macroeconomic impact of natural disasters and presented the IMF’s role in assisting countries coping with natural catastrophes. The scholars focused the attention of readers on the emergency financing, policy support, and technical assistance provided by the Fund to help governments put together a policy response or build a macro framework to lay the foundation for recovery and/or unlock other external financing. The literature and experience suggested that there are ways to strengthen policy frameworks to increase resilience to natural disaster shocks, including identifying the risks and probability of natural disasters and integrating them more explicitly into macro frameworks, increasing flexibility within fiscal frameworks, and improving coordination amongst international partners ex post and ex ante.

Raju et. al. (2012:258) evaluated the role of intra-government coordination for sustainable disaster recovery in South Africa and reported that intra-government coordination was highly essential to effectively manage natural disasters. The scholar further noted that media were not fully utilized by various government agencies for effective participatory communication and management in times of natural disasters.

Romo and Vos (2012:271) assessed the role of broadcast media in natural disaster preparedness education in Finland and observed that media information was a strong facilitator of awareness of disasters. The study revealed that an inclusive
approach was called for in order to involve vulnerable groups, such as the elderly or handicapped. The scholars suggested that broadcasting media should be utilized properly for providing warnings and updated information on the crisis situation.

SAARC Disaster Management Centre (2012:274) analyzed the role of media in disaster risk reduction in South Africa and noted that SAARC nations had not designed appropriate media intervention programmes to effectively manage the natural disasters. The study suggested that government agencies should make use of the multi-media campaigns in times of natural disasters in order to reach out to various stakeholders of natural disaster management.

Ahmed (2013:06) examined the disaster risks and disaster management policies and practices in Pakistan. The scholar found that the Disaster Management Act 2010 of Pakistan was highly relevant and useful in facilitating scientific disaster management. The study also reported that the authorities had the professional and social obligations which benefitted the masses in times of natural disasters.

Ash et.al. (2013:12) studied the relative impacts of natural hazards in the United States and pointed out that adequate flexible measures of hazard and impact were needed to allow comparisons across local places and different time periods. The scholars also reported that the losses of data were normalized by measures of economic capacity calculated during natural disasters. The scholars suggested that down-scaling of local and regional level showed different results with the relative impact in the study area.

Hackbert (2013) evaluated the role of smart phone as an economic development tool and reported that smart phone technologies had become the ‘Swiss army knife’ over a period of time for users across the globe. The study revealed that social media and mobile market had shifted significantly in the recent times and served the mankind by putting the marketers not only in a multi channel environment but a multipurpose environment. The scholar suggested that developers of websites and social media should take note of the usability of smart phones when designing their sites.

Ashraf and Routray (2013:14) assessed the drought coping strategies of farming households in North West Balochistan and observed that farmers had clear
perception of climatic variability and were prepared with necessary precautionary measures in times of drought. The study revealed that factors like inadequate supply of electricity for irrigation, over exploitation of ground water, population growth etc were responsible for drought situation in the study area. The scholars also suggested certain measures to cope with drought and achieve the goal of better production and productivity in the field of agriculture.

Becker et. al. (2013:31) analyzed the process of natural disaster management and constructed a common holistic description of natural disaster management. This has been widely debated by the community of scholars since it has provided practically relevant approaches to natural disaster management. The scholars have also facilitated better understanding of the roles and responsibilities of various stakeholders of natural disaster management.

Esteban et.al. (2013:96) examined the recent tsunami events and preparedness in Indonesia, Chili and Japan and found that the in recent years had witnessed the heightened state of tsunami awareness in many areas of the world. The study revealed that the response of different elements of society to tsunami warnings nowadays still appeared to be inadequate a times, pointing to lack of awareness by at least some individuals, an over-reliance in defense mechanisms or lacking in the transmission of knowledge from previous events. The scholars suggested that the level of tsunami awareness prior to these events should be assessed on the basis of the existence of multiple layers of safety against tsunami developed by previous generations.

Ferris et. al. (2013:102) studied the natural disasters that occurred in 2012 and pointed out that the hazard of wildfires occurred mainly due to urban growth and climate change across the world. The study also consisted of an analysis of the intersection between natural disasters and gender, looking at the different ways that disasters affect men and women and emphasizing the importance of women’s participation in disaster risk management. The scholars suggested that various stakeholders of natural disaster management should adopt disaster risk reduction strategies which take human rights issues into consideration.
Ivgin (2013:154) evaluated the decision-making models for relief asset management and interaction with disaster mitigation. The scholar has primarily dealt with the decision-making models for relief asset management and interaction with disaster mitigation. The study has also benefitted the policy makers and executives in several ways by providing relevant approaches to natural disaster management and media intervention packages.

Kaku et. al. (2013:164) assessed the space based natural disaster management support system in Sentinel Asia and observed that this system benefitted the various stakeholders of natural disaster management in several ways. The scholars have also suggested that disaster research, disaster management and disaster communication should be developed on the basis of expert suggestions and guidelines in order to enrich the process of natural disaster management.

Knight (2013:170) analyzed the hurricane sandy damages, crucial wireless and Internet infrastructure and noted that Internet based online communication was extremely beneficial in modern times for effective management of natural disasters. The scholar also noted that online communication facilitated better prevention, rehabilitation and management of natural disasters since it provided timely and adequate communication support for natural disaster management.

Le De et.al. (2013:185) examined the remittances and disaster on the basis of an extensive review of literatures and found the growing evidence of intensification of remittances in sustaining the development of people in terms of livelihood. The study revealed the need for further understanding of this mechanism to improve the information policies with respect to natural disaster management. The scholars concluded that building on this coping mechanism would facilitate achieving the goal of mitigating vulnerability in time of natural disaster.

Mavhura et. al. (2013:200) studied the relationship between indigenous knowledge, coping strategies and resilience to floods in Muzarabani, Zimbabwe and pointed out that the relationship existed between indigenous knowledge, coping strategies and resilience to floods in Zimbabwe. The study also reported that indigenous knowledge system played a significance role in reducing the impact of flood in the study area. The scholars suggested that an ideal mix of indigenous and
advanced tools, technologies and systems would protect the environment and people in times of natural disaster management.

Smith (2013:313) evaluated the impact of telecommunication and online communication channels on people in times of natural disasters such as tornado in Oklahoma, America. The study reported that advanced communication channels served the purpose of natural disaster management effectively due to certain in built characteristics and capacities. The scholar suggested that advanced media of communication should be utilized properly and judiciously for effective management of natural disasters.

Spence (2013:316) assessed the African herdsman use mobile phones for drought alerts and observed that mobile phones were highly effective channels of communication for alerting the various stakeholders of natural disaster management. The scholar also noted that mobile phones facilitated better social mobilization in times of natural disasters and enabled the authorities to undertake proper rehabilitation activities.

Sternberg and Batbuyan (2013:320) analyzed the disaster risk reduction policy and management in Mangolia and noted that the Hyogo Framework for Action stresses disaster risk reduction (DRR) at local, national and international levels and provided guidance to risk-prone countries. The scholars also provided a framework that aims to strengthen adaptive capacity, increase resilience and reduce disaster risk, particularly in developing countries. Mongolia exemplifies the importance and challenge of DRR in a nation highly vulnerable to climate hazards, according to the study.

Szjie (2013:324) examined the role of mobile apps in natural disaster management in Taiwan and found that mobile apps provided locally relevant and situation specific communication support for effective management of disasters. The scholar also contributed useful analysis and offered certain healthy practices of communication and management in times of natural disasters.

Torres (2013:331) studied the Taiwan experience in the application of disaster proofing telecoms and pointed out that Japan learned certain healthy practices from this success story. The scholar also noted that disaster-proofing
telecoms should be effectively used as channels of participatory communication for natural disaster management in the new millennium.

West and Valentini (2013:357) evaluated the role of mobile devices in transforming disaster relief and public safety and reported that these devices allowed the people pin point the locations of earthquake and tsunami in Thailand and Japan. The study revealed that these advanced devices also provided emergency response information to people in times of need. The scholars suggested that new media applications would mitigate the adverse consequences of natural disasters and facilitate efficient management of natural disasters.

Wood and Martines (2013:367) assessed the collapse of wireless networks in times of hurricane sandy and observed that wireless networks failed miserably since they were not developed to meet the natural disaster like hurricane. The scholars suggested that advanced communication technologies should be utilized properly for effective management of natural disasters.

Zhonglang et.al. (2013:380) analyzed the multi-scale seismic hazard and risk in the China mainland with implication for the preparedness, mitigation, and management of earthquake disasters. The scholars have noted that Chinese model of natural disaster management is practically beneficial in the mitigation and management of earthquake disasters in particular. The scholars have also strongly advocated media intervention for effective management of natural disasters.

2.3 Indian Studies

Caldwell et. al. (1979:55) examined the role of press in cyclone disaster management in Andhra Pradesh and found that print media sensitized the policy makers, administrators and general public’s about the rehabilitation of the affected persons after the cyclone disaster. The scholars also noted that print media gave high priority for the coverage of natural disasters and failed to contribute useful follow up stories after the occurrence of natural disaster.

Rogers and Sood (1980:270) studied the role of mass media in natural disaster management with reference to Andhra Pradesh cyclone and the Sahel drought and pointed out that broadcasting media provided early warning services
and print media provided post-natural disaster management services very effectively. The scholars also noted that the contribution of mass media for meaningful natural disaster management was not significant.

Rogers and Sood (1981:268) evaluated the role of mass media in natural disaster management and reported that mass media did not provide adequate post-natural disaster management education and guidance to the authorities concerned in the study area. The scholars suggested that media should be utilized properly by the authorities in order to facilitate active participation of various persons in the process of natural disaster management.

Wilkins (1986:362) assessed the media coverage of the Bhopal disaster and observed a cultural myth in the coverage concerned. The study also reported that media provided in depth coverage of the causes, consequences and remedial measures on a priority basis. The scholar also highlighted the lapses of American government and the corporate house.

Singh (1989:306) analyzed the communication systems for human resources development of farmers in Haryana. The study noted that communications media contributed insignificantly for the development of human resources among the farmers in the study area. The scholar has suggested that education, health, nutrition, leadership development, natural disaster management and other important aspects of national development should be covered in the media services.

Lewis (1993:187) examined the role of print media in cyclone disaster management in Tamil Nadu and found that the press in Tamil Nadu carried the cyclone disaster incident on a priority basis. The study revealed that the press did not provide practically useful information and guidance to the various stakeholders of cyclone disaster management in the study area.

Mathur (1995:198) studied the media and early warning with respect to natural disaster and pointed out that mass media in India did not rise to the occasion in facilitating timely warning and practical guidance with respect to natural disaster management. The scholar suggested that natural disaster management should be covered by the media on the basis of specialized professionals and advanced strategies of communication.
Kalam and Rajan (1998:165) evaluated the obligations of policy makers, educationists, economists, scientists, technocrats and others with a view to make India a superpower in all respect. This is widely quoted academic work which intends to create new development consciousness among the policy makers and people. The scholars have also adequately dealt with environment protection, sustainable development and other dimensions of national development in the new millennium.

Venkatachary and Gupta (1998:346) assessed the use of space technology for disaster management with special emphasis on rural areas in Andhra Pradesh. The scholars observed that natural disasters occurred mainly due to increasing environment pollution and that people should be prepared to accept such challenges and manage the disasters in a proper way. The study suggests that disaster management can become meaningful if latest space technology is adopted for the purpose of taking precautionary measures and rehabilitating the affected people in the right time by following right methods.

Bhatia (1998:38) analyzed the necessity of SATCOM technology for agriculture development, environmental protection and rural development in India. The study noted that rural masses were given the benefit of locally relevant broadcasting services mainly because of revolutionary satellite communication technology development in India. The scholar suggests that satellite communication technology should be developed all over the country in order to enlist active participation of rural masses in the process of sustainable development.

Balaji (1998:21) examined the role of communication technologies which have brought about digital divide in India and abroad. The scholar has found the status, strengths and limitations of communication technologies which have become prominent means of globalization of communication. The study offers meaningful suggestions for bridging the rural-urban divide in India society. The work is indeed a very useful source of information and analysis on the role of communication technologies in environment protection, natural disaster management and sustainable development with reference to India.
Balakrishnan (1999:23) studied the impact of new communication technologies on society which contains several thought provoking articles on various aspects of communication technologies. The scholars have commonly pointed out that NCTs have become an inseparable component of modern society and that national governments should provide adequate financial support for the adoption of NCTs in various development oriented organizations in India and elsewhere.

Gupta (2000:133) evaluated the various aspects of development communication strategies and services which provide useful details to the policy makers, academicians, researchers, practitioners and others responsible for building development communication system in the country. The scholar has also focused the attention of various stakeholders of national development on agricultural development, natural disaster management and sustainable development in India.

Bhatnagar and Schware (2000:40) assessed the various aspects of use of ICTs in India and observed that adoption of a proactive strategy would enable the rural people to face the unprecedented challenges brought on by the changing global economy, political changes, and environmental degradation. The work suggests that the new media should play a pivotal role in the management of natural disaster and achievement of sustainable development in India.

Rao (2001:260) analyzed the importance of satellite technology in rural development with reference to India and noted that satellite communication channels were capable of providing meaningful linkage between development system, link system and client system in a developing country like India. The scholar suggested that satellite communication technologies should be harnessed for agricultural development, natural disaster management and other nation building endeavors in India.

Melkote and Steeves (2001:207) examined the discipline and practice of development communication which reveals that development communication has grown over a period of time as a specialized area of study and practice of development management. The scholars found that the practice of development communication was not based on adequate political will, official support, people’s participation and experts’ evaluation in India and other developing nations. The
scholars have also called upon the media institutions to facilitate agricultural development, natural disaster management and integrated development in India.

Balakrishnan (2001:22) studied the relationship between the information and communication technologies and the digital divide in the third world countries and pointed out that ICTs have been contributing to a significant part of the economy of many developing nations. The study reveals that the third world countries have accorded a high priority for the application of ICTs in various administrative and developmental organizations in order to boost the national economy. The scholars have suggested that new media should be utilized properly for the development of agriculture, natural disaster management, sustainable development and other worthy causes.

Keniston (2002:168) evaluated some grassroots ICT projects in India and reported that grassroots ICT could be a significant and cost-effective way of responding to the needs of large disadvantaged sections of the Indian population. The study reported that most of the ICT projects were built almost entirely on an empirical vacuum. The scholar suggested that new communication technologies should be utilized by the authorities concerned for the purpose of agricultural development, environment protection and grassroots development in India.

Kumar and Shah (2002:180) assessed the role of electronic media in agricultural and rural development with reference to southern region of the country. The study dealt with rural broadcasting services delivered by All India Radio, Doordarshan and other private electronic channels and noted that broadcasting services created considerable awareness among the people about agriculture and rural developing projects implemented in the countryside. The study observed that community radio stations and low power television stations should be utilized as effective instruments of agricultural development, natural disaster management and grassroots development in India.

Kumar and Jhunjhunwala (2002:179) analyzed the role of Internet in the process of development and noted that Internet had become an important instrument of development over a period of time in India. The scholars observed that Internet use patterns, advantages of Internet and impact of Internet on people should be
scientifically evaluated in India. The scholars also suggested that Internet should be used as an effective instrument of natural disaster management and grassroots development processes.

Kumar and Chada (2002:178) examined the potential of information and communication technologies for development in South Asia and found that developing countries took note of the capabilities of new media as effective instruments of sustainable development and natural disaster management. The scholars suggested that infrastructure development, system management, manpower development, application of new media, natural disaster management and inclusive development should become thrust areas of national development in India.

Shaw and Sarma (2003:294) studied the community recovery and its sustainability in Gujarat in the post-Gujarat earthquake. The scholars pointed out that mass media contributed significantly towards meaningful management of rehabilitation programme after the earthquake. The scholars suggested that mass media should accord high priority for agricultural development, natural disaster management, rural development and inclusive development in modern society.

Joshi (2003:162) evaluated the role of communication in national development with reference to India and reported that communications media did not facilitate integrated agricultural and rural development in India since they were under the control of market forces. The scholar suggested that agricultural promotion, cooperation management, natural disaster management and sustainable development should be promoted by the media as a matter of corporate social responsibility.

Devraj and Chaturvedi (2003:86) assessed the role of Internet as a means of technology transfer in the field of agriculture with reference to Karnataka. The study observed that Internet had enough penetration into the rural areas as an effective channel of interactive and instantaneous communication at the grassroots level. The scholars have suggested suitable strategies for effective management of new media including Internet in the rural areas as tools of agriculture and rural development.

Bhatnagar (2004:39) analyzed the role of e-governance in natural disaster management, agricultural development and sustainable development with reference to India. The scholar noted that new media had the capacity for mobilizing various
stakeholders of public administration and development. The scholar also suggested that new media intervention for agricultural development, natural disaster management, decentralized development and other aspects of national development was the need of the hour in India.

Rao et.al. (2004:262) examined the relevance of e-governance and noted that new media were used extensively for various developmental endeavors in India. The study found that e-governance had enhanced the chances of people’s participation in the process of grassroots development. The scholars suggested that new media infrastructural facilities should be expanded in the rural areas in order to enlist the active participation of people in various disaster management and development management activities.

Rao (2004:261) studied the role of ICT in rural governance and development in India and pointed out that rural e-Governance applications in the recent past had demonstrated the important role the information and communication technologies (ICT) played in the realm of rural development. The study reported that several e-Governance projects had attempted to improve the reach, enhance the base, minimize the processing costs, increase transparency, and reduce the cycle times. The scholar suggested that suitable public-private partnership models should be adopted to ensure rapid development and cost-effective solutions in various fields such as agriculture, disaster management and sustainable development in India.

National Disaster Management Division (2004:218) evaluated the status, problems and prospects of natural disaster management in India and submitted a status report to the Government of India. The division also noted that natural disaster management should be developed as a specialized branch of management in a developing country like India. The study suggested that multimedia campaigns would boost agricultural development, environment protection and sustainable development in India.

Indira Gandhi National Open University (2004:149) assessed the need and importance of disaster preparedness as a professional discipline in India. The study observed that natural disaster management had not grown as a specialized area of management in a developing country like India. The study also suggested that
authorities of natural disaster management should effectively utilize various channels of communication to enlist active participation of people in their activities.

Bhatnagar (2004:39) analyzed the development of e-governance in India and noted that e-governance had brought about a new era of participatory communication and development in India. The scholar also noted that a large number of people in the rural areas remained as new media illiterates even though new media were accessible to them for day to day communication and development. The scholar suggested that new media literacy and development literacy should be promoted among the marginalized sections of society in India.

Satyanarayana (2004:280) examined the role of e-governance in the process of integrated rural development in India. The scholar found that e-governance had brought about several advantages such as transparency, accountability, social responsibility and participatory development in India. The scholar suggested that people-friendly new media initiatives should be adopted at the grassroots level to enlist the active participation of people in the process of development.

Jha (2004:159) studied the role of information and communication technology in the empowerment of women and weaker sections in the rural India. The study pointed out that application of ICTs in the Panchayat Raj institutions created new opportunities for transparency, accountability and participatory governance and development at the grassroots level in India. The study also suggests that ICTs should be properly developed and used as effective tools of agricultural development, environment protection, natural disaster management and other branches of national development.

Vedakumar (2005:344) evaluated the role of information and communication technologies in rural development with reference to India and reported that application of ICTs would boost agricultural development, environment protection and integrated rural development in India. The scholar provided a set of strategies and operational guidelines which would enhance the status of rural development through meaningful application of ICTs.

SatyaJit (2005:279) assessed the communication strategy for achieving the goals of agricultural development, women empowerment, environment protection
and integrated development in India. The scholar observed that most of the developmental projects in India did not receive adequate media coverage due to lack of social commitment on the part of media. The scholars also emphasized the need for agricultural development, environment protection and sustainable development in India. The scholar has also provided suitable development communication strategies which would fit into Indian context.

Chowdhury and Ray (2005:69) analyzed the communication support for sustainable development with a special emphasis on paradigm shift. The scholars have also provided a meaningful comparative analysis of old and new paradigms of communication and development in particular. The study provides useful guidelines on the media intervention for effective environment protection, agricultural development and integrated rural development in India.

Sinha et.al. (2006:308) examined the process of natural disaster management in India and found that government agencies, non-government institutions, media organizations and other agencies were not actively involved in the process of natural disaster management. The scholars suggested that the process of natural disaster management should be strengthened on the basis of suitable media campaigns in India.

Dayal (2006:81) studied the role of ICT in the process of rural development in India and pointed out that new communication technologies had the capacity to bridge the developmental gap in India. The scholar suggested that new media should be effectively used as effective instruments of agricultural development, community development, natural disaster management and sustainable development in the nation.

Goel (2006:120) evaluated the process of natural disaster management in India and edited an encyclopedia of disaster management. The work reported highly thought provoking and practically relevant insights into the subject of natural disaster management. The scholar has also dealt with various dimensions of natural disaster management and suggested suitable media intervention initiatives for effective management of natural disasters.
Mathur (2006:199) assessed the role of media and technology in rural development with reference to India and observed that the quest for rural development must lead the policy makers in the direction of empowering the marginalized sections of rural society. The study concludes that a re-examination of national media policy and expansion of grassroots media initiatives would facilitate sustainable rural development in India.

Ghosh (2006:117) analyzed the various dimensions of sustainable development in a developing nation like India. The study noted that the governments in the newly independent developing countries, with their agenda of modernization, failed to deliver on their promises and the successful model based on the Western experience largely benefited the ruling elite and educated middle class in these countries. The scholar also noted that defining development only in terms of quantifiable measures like GNP and per capita income was inadequate in view of the gross inequality in the distribution of income and wealth in these countries.

Dhanraj (2006:87) examined the role of information and communication technology (ICT) in agricultural development, cooperative management, decentralized administration, natural disaster management and other aspects of integrated development in India. The scholar found to the existence of digital divide in Indian society and called upon the authorities concerned to bridge the communication gap and facilitate development of the marginalized sections of society.

Singh (2007:305) studied the role of communication in agricultural and social development with special reference to India. The work pointed out that communications media did not provide priority-based support and guidance for effective implementation of agricultural development programmes, natural disaster management initiatives and social transformation activities. The scholar has also suggested suitable communication strategies for the socio-economic progress of the country.

Qureshi (2008:258) evaluated the impact of information and communication technologies on development with reference to India and reported that the presence of new media was not felt by a vast majority of people who suffered from social and
economic backwardness in Indian society. The scholar examined the possibilities of enhancing the access, utility and relevance of ICTs as effective instruments of environmental protection, natural disaster management, sustainable development and integrated development in India.

Yogisha (2008:379) assessed the progress of rural economy vis-à-vis information and communication technologies in India and observed that new media technologies were not accessible to the majority of people in the rural areas due to illiteracy, poverty, unaffordability and other factors. The scholar suggested that government and non-government organizations should provide the benefit of access to new media which have the capacity to enlist the active participation of various stakeholders in the processes of agricultural development, community development, natural disaster management and inclusive development in the country.

National Institute of Disaster Management (2009:219) analyzed the causes and consequences of natural disasters in a developing country like India and noted that the process of natural disaster management was not strengthened properly on the basis of mobilization of ideas, guidelines, strategies and practices which suit India. The study also suggested that integrated efforts were required to manage the natural disasters on the basis of proper planning, coordination and execution in India.

Thakur (2009:326) examined the role of new media in development with reference to India and found that almost all the States and Union Territories provided market information in one form or the other for the benefits of market users like producers, traders, and consumers. The study reported that the information was collected and disseminated by use of conventional methods, which caused inordinate delay in communicating the information to different target groups in times of natural disasters which adversely affected their economic interest. The scholar suggested that new media should be utilized by various development departments to facilitate natural disaster management, agricultural promotion, sustainable development and integrated rural development in India.

Caritas India (2010:59) studied the role of community in the management of natural disasters in India and pointed out that most of the members of the
community were not fully equipped with the art and capacity of natural disaster management. The study also reported that local community did not participate actively in the process of natural disaster management in the absence of proper education, training and orientation. The study suggested that community specific media intervention programmes would enlist the active support and participation of community in the process of natural disaster management in India.

Nayak, Thorat and Kalyankar (2010:221) evaluated the role of ICT in sustainable rural development with reference to India and reported that ICTs offer unique opportunity to introduce new activities, new services and applications into rural areas. The study reveals that ICTs can play a significant role in combating rural and urban poverty and fostering sustainable development in the country. The study concludes that ICTs offer the developing country, the opportunity to look ahead several stages of rural development by the use of Internet.

Pasupuleti (2013:237) assessed the need for designing culturally responsive built environment in post-disaster context with reference to Tsunami in Tamil Nadu. The scholar observed that the importance of connectivity as a construct of cultural continuity that linked approaches for designing built environments with a socio-special understanding of traditional settlements in post-disaster context. The scholar suggested that culturally responsive environment should be built in a pluralistic society like India in order to facilitate reasonably good settlement of fishermen in Tamil Nadu.

Raju and Becker (2013:259) analyzed the significance of multi-organizational coordination for natural disaster recovery which is one of the most neglected areas of disaster risk management in a developing country like India. The scholars also investigated the factors affecting coordination for long-term recovery and highlighted five key factors that affected coordination in long-term recovery such as - the need to coordinate, the role of the government, knowledge networking, mandates and goals and coordination at the donor level. The study indicated a potential for applying a governance perspective on disaster recovery coordination, which needs to be further researched.
Leboeuf, Janice (2013) examined the role of social media and smart phone in the development of the agriculture in Ontario and found that in the fast changing communication and mobile landscape, these media served as a base line to pick out trends and help agri-businesses and organizations plan communication and technology strategies. The scholar suggested that effective communication strategies should be followed by using newer communication technologies and initiatives to improve agriculture productivity.

2.4 Karnataka State Studies

Guru (1997:134) studied the status of grassroots development communication in Karnataka State by adopting factor analysis method. The researcher primarily dealt with the process of grassroots development communication management and media intervention for grassroots development in developed and under developed regions of Karnataka State. The scholar suggested that multimedia campaigns should be launched in the rural areas to facilitate integrated rural development and natural disaster management in Karnataka State.

Government of Karnataka (2000:128) evaluated the role of ICTs in agricultural development, sustainable development and natural disaster management in Karnataka state. The study reported that Karnataka State had emerged as a model state in India. The report also suggested that development departments of Karnataka State should use the new media as effective instrument of agricultural development and integrated development.

Chakravarthy (2004:65) assessed the role of ICT in rural development, agricultural development and natural disaster management in Karnataka. The scholar observed that new media had the potentials to enlist active participation of people in the processes of agricultural development, rural development, environmental protection, natural disaster management and so on. The scholar called upon the various stakeholders of development to utilize communications media for sustainable development in Karnataka.

Tiwari (2005:330) analyzed the role of advanced communications media for rural development with reference to Northern Karnataka and noted that highest
utilization of advanced communication media and tools such as computer, Internet, laptop etc., were used by the higher and middle level of extension personnel for the purpose of documentation, seminar, presentation and other communication endeavors. The study suggests that advanced communication technologies should be used in the rural areas in order to further the cause of agricultural development, cooperative management, empowerment of women, social welfare, natural disaster management and other areas of sustainable development.

Krishna et. al. (2006:175) examined the ICT initiatives across rural Karnataka and found that Karnataka had become the software capital over a period of time. The scholars also observed that the state government of Karnataka had launched several initiatives to facilitate agricultural promotion, natural disaster management, decentralized development and distributive justice. The scholars suggested that a healthy combination of various media should be utilized by the development departments to achieve the goal of integrated rural development including agricultural promotion and natural disaster management in Karnataka State.

Chavali et. al. (2013) carried out an impact evaluation of KSNDCC Help-Desk Services and noted that the organization provided periodic and timely facilities for providing weather related information to farmers, fishermen and common man on natural disasters to achieve the goal of agricultural development in Karnataka State. The scholars observed that the people received the technical advice and increased profits through agricultural operations in times of natural disasters. The scholars suggested that the organization should provide need based services through advanced SMS facilities.

2.5 Summary

Karnataka State has achieved commendable progress in the fields of agricultural development, Panchayat Raj, rural development and natural disaster management. The government departments have developed sound communication networks to facilitate sustainable development in the state. There are couple of initiatives which have facilitated meaningful natural disaster management in the state. There are a good deal of scientific investigations dealing with agricultural