Disaster and crises management strategy

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Abstract The aim of the research is to deepen the preparation and early warning of all types of disasters, natural and artificial ones, considering the scarcity of resources and the difficulty of acting during and after disasters. The research discussed the mechanism of preparedness at various stages of disasters and the justification for including such a practical plan. A historical background was presented, the most important terms of disaster reduction were defined. The research also clearly discussed a vision of the disaster reduction effect from a purely environmental point of view. Many disasters are caused by excessive human exploitation of the environment or neglect of environmental resources. Which led to the inability of some ecosystems to withstand, therefore, collapsed and the disaster occurred.

The practical part, questioner was designed to assess the potential of Local Government and individuals to plan ahead, especially with the recent threat of flood, earthquakes and wars. The findings showed that there should be more efforts to cope the deficit in the adoption of mechanisms of disaster risk reduction in the stages (before - after - during) at the institutional and community level.

The second area of the practical part included the review of the experiences of 10 countries that had experienced natural disasters or wars and the impact of these crises on them compared with their readiness, infrastructure and social awareness. Data were introduced in the linear regression model and an inverse relationship was found between the inclusion of plans and the extent of damage caused by the disaster. The greater the readiness, the less harm and vice versa, which proves the hypothesis of research.

1. Introduction
Crises are a phenomenon that affects nations and peoples in all stages of their national plans. The growth and expansion of societies, the depletion of diverse resources and the intensity of political competition and economic, have lengthened the life of crises and supported lack of preparedness to the extent that the history of the previous century, for example, witnessed a series of crises interspersed with short stages of temporary solutions.

What this modest research indicates is the paramount importance of proactive plans and the lack of harmony between resource conservation, respect for the environment and waste of resources. This may be a cause of frequent disasters, which is explained by the recent increase in industrial and human processes, which has caused growing environmental degradation associated with global disasters.

Problem: Disaster risk and crisis considerations are not included in national plans. The plans usually lack for future and foreseen disaster mitigation resources.
Objective: To prevent or mitigate the impact of disasters and crises and avoid ad-hoc solutions.
**Hypothesis:** The more disaster and crises plans are included in the regional planning process, the less damage from disasters and crises.

**2. Research Methodology:**
A theoretical part to demonstrate the literature of planning processes related to disaster risk reduction and a practical part of the questionnaire form for experienced and decision-makers and a simple regression model for standardization of the experimental products of 10 countries.

**3. Importance of the subject**
The number of disasters recorded over the past two decades has doubled from nearly 200 to more than 400 a year, 9 out of 10 of these disasters related to climate. Current climate change projections indicate that this trend is continuing and that serious weather-related phenomena will become more frequent and more volatile. Between 2001 and 2002, there were more than 4,130 natural disasters in the world, resulting in more than 1 million and 117,000 deaths, resulting in losses of more than $1195 billion. The report of the United Nations Office for Natural Disaster Reduction (UNODC), which was prepared for the post-2015 period, indicated that the tsunami and major earthquake in eastern Japan sent a clear message that "even developed countries are not immune to such devastating disasters.

**4. Historical Overview**
Disasters vary in strength and gravity in terms of human and material losses. However, despite scientific and technical progress, it was unable to prevent it or to determine precisely where and when it occurred. National and regional scientific conferences and symposiums were held to discuss diverse topics of natural hazards to human and other living life. A Kobe, Japan, 2005 international conference concluded with the commitment of participating countries to reduce the risks faced by millions of people exposed to natural disasters. A workshop organized by the World Meteorological Organization (WMO) after the seismic waves (tsunami) resulted in a joint cooperation agreement between Germany and Indonesia. Early warning system for tidal waves in the Pacific and Atlantic oceans was the most important product of this agreement.

Historical sources and recent records indicate that there are many earthquakes in the Arab world, especially in the context of seismic belts: The Red Sea and Aden belt, the Atlantic belt in north western Africa, and the Zagros mountain belt, which runs from northern Iraq to the Omani highlands in the south and the Dead Sea.

In November 1995, The Middle East earthquake was centred in the Gulf of Aqaba and included coastal areas in Egypt as well as Jordan, Palestine and Saudi Arabia and was felt by the inhabitants of Lebanon, Syria and Cyprus. Regions in Iran were exposed for devastating earthquakes after the war in Iraq in 2003. Some areas in Saudi Arabia are exposed to frequent and violent floods, resulting in the destruction of roads and bridges. Recently, In Iraq, there has been a series of earthquakes and floods risks which was a sign of alert. The importance of preventive education to help individuals to face these

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3 [http://usinfo.state.gov/gi/global_issues/recovery.html](http://usinfo.state.gov/gi/global_issues/recovery.html)
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6 [http://www.najah.edu/arabic/Centers/ESSEC.asp](http://www.najah.edu/arabic/Centers/ESSEC.asp)
7 [http://earthquake.usgs.gov/faq/](http://earthquake.usgs.gov/faq/)
8 Mohammed Mahsoub and Mohammed Arbab (2002). Natural hazards and disasters - the event and confrontation geo-treatment, Cairo, Dar al-Fikr al-Arabi p. 97.
risks and to maintain their safety and health and to teach to behave appropriately in the face of what could happen is a major key of disaster reduction strategy.

**Definitions**

Disasters: Serious confusion in the performance of the community causes extensive human, material, economic or environmental losses that exceed the capacity of the affected community to cope with its own resources. The disaster is a continuum of risk and arises from a combination of hazards and conditions of vulnerability, inadequate capacity or measures to reduce the potential adverse effects of hazards.

Disaster Risk Reduction: A conceptual framework for elements that have the potential to reduce vulnerability and disaster risks in society as a whole and to prevent and mitigate the negative impact of hazards within the overall framework of sustainable development.

Hazards: A physical event, phenomenon, or human activity that may cause loss of life or damage, damage to property, social and economic confusion, or environmental degradation that may result in destruction. This could include potential conditions that may represent future threats and may be of different origin: natural, geological, hydrological, meteorological or biological. Risks can be individual, sequential, or common in origin and effects. Each of these risks is distinguished by its location, unity, frequency and potential.

Preparedness: are the capacities and knowledge developed by governments, technical response organizations, communities and individuals who can predict, and respond effectively to the impact of events or conditions of potential, imminent or current hazards.

Preparedness measures are undertaken in the context of disaster risk management and should be based on sound disaster risk analysis and well-connected with early warning systems. They include contingency planning, equipment and supplies storage, emergency services, standby arrangements, communications, information management and coordination arrangements, staff training, community training and exercises, and public education. This must be supported by formal institutional, legal and budgetary capacities.

Relief / response: providing assistance or intervention during or immediately after a disaster, in order to sustain the life and basic subsistence needs of the affected population. This may be done immediately, in the short term, or for a long time.

Capacity to cope with disasters (Resilience): the ability to absorb pressure or destruction through resistance or adaptation; to manage and to continue to do basic tasks and structures during catastrophic events; and to recover from a resurgence after the event.

5. Planning priorities within the process of preparedness

Planning for preparedness is intended to sustain preparedness. Here, several questions arise as to what we mean by readiness:

- Is there a representation of the supporting bodies involved in the process of alert? Including technical advisory bodies.

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9 Bulletin issued by the secretariat of the United Nations Strategy for Disaster Reduction and the United Nations Office for the Coordination of Humanitarian Affairs.
10 International Strategy for Disaster Reduction, 2007.
• Is there representation of relevant international and local organizations and institutions? Often these organizations have sources of information of paramount importance that should not be overlooked in the process of alert.
• Is there an organizational framework for the work of these parties (mechanisms of work, meetings and periodic reports)?
• Have social and cultural considerations been adopted in the planning process? Including the moral aspect and the preservation of the dignity of the people in response to their basic needs?
• Have women been involved in the planning process?
• Are members of the community involved in planning and decision-making?
• Are the requirements of the neediest groups diagnosed?
• Have any sectoral tensions been considered among the people? Between the host society and the displaced, for example?
• Has the extent of environmental degradation been assessed, leading to a weak capacity for environmental integration to cope with disasters?
• Conversely, has the impact of disasters on the environment been assessed in the future?

This clearly shows that the process is complex and requires a high sense of responsibility and a real moral obligation. It is not the development of the plan that is the end of this process, but the ability to apply it and put it on the ground. That is why we see many developed countries conduct pre-training exercises and assume a disaster to measure the response capacity and diagnose the imbalance before the disaster.

6. Basic principles for disaster risk reduction implementation
a) Contribution of the local community
b) Including the plans of preparation within the national plans.
c) Deepening the principle of decentralization in dealing and planning for the stage of preparation.
d) Considering the partnership between all public and private sectors and international and local NGOs

7. Resource allocation and funding
The availability of funding and resources for both planning and operations is essential for a well-functioning disaster management system. National legal frameworks should include allocation of funds in the national budget and an institutional funding mechanism for risk and disaster management.

Even if the national plan does not first recommend international assistance, appropriate legislation and policies should be in place to facilitate the entry and management of external funds and to ensure that they are effectively transferred to local levels. This should include the approval of financial laws and the development of standard operating procedures for accessing and using such resources. In addition, procedures should be established to expedite customs / tariff issues for incoming relief items and other in-kind donations. International organizations should also be involved in the contingency planning process and integrate disaster risk reduction into national development processes, such as World Bank-financed poverty reduction strategies, enabling Governments to conduct a pre-disaster dialogue on the availability of funds for international preparedness and response. On the other hand, many disaster funds at the international level cannot directly fund government relief operations, but instead require United Nations agencies or non-governmental organizations to work in the field.

8. Disaster management contexts
The concept of disaster management is linked to the study of administrative and political decisions, activities and processes related to the stages of disaster. With reference to the role of different institutions in relief operations.
The stages of disaster management usually go through the so-called “Four Rs stages”\textsuperscript{11}:

1. **Reduction**: the stage of reducing or preventing the expected effects, including structural considerations when preparing designs for resistance or disaster.
2. **Readiness**: where work is done with early warning systems and the necessary training.
3. **Response**: which begins after the disaster and includes coordination efforts between the supporters of the relief operation.
4. **Recovery**: A stage that is intended to return to normalcy. It may also be an opportunity to get into a deeper stage than before and make drastic changes that might make the situation better than it was.

![Fig. (1) Stages of disaster response](image)

**Resource**: Researcher

**Early Warning System** An early warning system is the ability to absorb signals of potential disasters or crises, enabling all measures to be taken to avoid them. The process monitors and records signals that predict a disaster or crisis. Senior management in the governing institution as well as the community should have the ability to identify early warning signals for disasters and crises. This requires an assessment of institutions for their ability to predict crises to avoid them or mitigate their effects as they occur\textsuperscript{12}. The fundamentals of the system can be:

1. Moral and professional obligation
2. Ability to predict and analyze
3. Addressing issues
4. Use of technology in communication and presentation of results
5. Follow-up and archiving

**9. The Crisis**

Crisis: It is defined as any situation in which the life or well-being of persons is threatened unless appropriate and immediate action is taken, which requires extraordinary response and exceptional measures. It is therefore necessary in the case of crises to form the so-called crisis management cells that deal with and resolve the crisis. The cells shall not be limited to disaster time only but must be present before and after the disaster to take advantage of lessons learned and develop future responses. In Iraq, and as a result of the recent threats of floods, a crises management cell was created and headed by the highest Sr staff of the government. The most important tasks related to the work of this cell before the crisis are:

- The collection of central goods stores, which include government parcels of humanitarian aid.
- Signing memorandums of understanding with a number of external agencies.
- Emergency contingency planning is in place, as well as planning throughout each phase of the crisis.

\textsuperscript{11} Ngoh Tiong Tan, "Emergency Management and Social Recovery from Disasters in Different Countries", Journal of Social Work in Disability & Rehabilitation, Vol.21, No.1, May 2013, PP 8-10.

\textsuperscript{12} Bousiso, Fouad Hamdi, Priority of developing early warning indicators for economic crises, article published in Al-Dustour newspaper, July 18, 2010
• Coordination of priorities, as well as contingency planning and operations.
• Provide adequate numbers of crisis management staff with the right skills and experience to deploy them in the right places, equip them with the necessary authority, material and logistical support.

1st Practical part
10. National Survey Result Analysis

A questionnaire was conducted to assess the local preparedness by experienced persons and decision-makers. The questions are related to the recent floods and earthquakes that hit the country in addition to the recent crises resulting from liberation operation of areas under ISIS. The point is to highlight the national preparation process in those crises. The below, are the findings of the questionnaire.

a) The existence of a plan for the government to face the crisis / disaster before it happens.
80% of the sample said that there is a plan for the government before the occurrence of crises or disasters. While 20% said, there was no such plan. This raises a question of to what extent this plan can be seriously adopted.

b) The existence of a plan for the government to face the crisis / disaster when it happens.
50% said there was a clear plan at the time of the disaster and the same percentage showed that it did not exist. To analyse this, the country has not experienced many natural disasters, but it has witnessed many wars, a 13-year economic embargo/sanctions and some precautionary measures as a result of the rising levels of the Tigris at certain times. The vision is limited to a set of unexplored jurisprudence, as in countries that have experienced severe consequences with natural disasters.

Iraq, however, remains in a turbulent political and security situation that spanned 1980, beginning with the Iraq-Iran war, the first and second Gulf War and devastating impacts on infrastructure. Those wars were catastrophic experiences that demonstrated the ability of the decision maker and the planner to absorb the lessons. The fact that 50% of the respondents believe that there is no plan during the disaster or crisis is a big indicator of the weakness of the preparedness and that half of the decisions are improbable.

Another explanation for the existence of such a view (50% there is no plan), is that the planner or the decision-maker may seek to read the situation as it is, and then act. But the question remains if time is sufficient to build a plan at such a critical period.

c) Having a plan for the local government after the disaster
70% said there was no plan or no integrated plan. 30% of them indicated the presence of such a plan. This reflects a major sign of poor preparedness for post-disaster crisis. These results may be based on the aftermath of the war in some cases of war and destruction in Iraq.

d) Inclusion of disaster and crisis funds in the local budget
60% of the sample said there is such inclusion, which represents a good indicator of government interest in finding funding sources, although there is a hint of post-crisis planning weakness in previous questions. That would raise a question here, in the case of the availability of money but without a plan, how would that work? Will there be professionalism and justice in the absence of advance planning? 40% said there was no disaster funds allocated in the local budget.

e) The presence of structural changes in engineering designs in the event of disasters (such as earthquakes).
70% said there were no such hedges in the construction buildings, despite their presence in the construction codes. But designers seem to be neglecting this aspect because of the extra costs involved (extra concrete and consequent costs). At the level of houses and civil buildings, these safety factors are
completely absent because of the cost and the lack of a sense of a real threat by earthquakes. 30% of them said that there are such protective factors, and perhaps they pointed to the reinforcement of dams, periodic maintenance works and the strengthening of river banks.

f) **Awareness before, during and after disasters**
80% said there was insufficient awareness by the citizen to act when such cases occurred, which represents an indicator of the absence of guidance / information sharing directed at the public to act and respond when disasters occur. The remaining 20% showed the existence of such awareness, which may be the result of the experiences of previous wars and the economic blockade. In some crises times, some citizens may buy food in anticipation of emergencies in the event of a break roads and the difficulty of access to food and medicine.

g) **Having a personal plan in the event of a disaster**
30% said yes. 70% said no! This is another sign of local indifference. The experiences of countries in dealing with various phases of the disaster (before-after-during) indicate a clear popular public role in controlling things and assisting the government and the non-governmental and community institutions in organizing response and relief operations. The confusion of citizens is another burden added to the disaster as everyone wants the government to provide solutions, which may be impossible in the absence of pre-hedging by the government or society (groups and individuals).

h) **The possibility of having your city exposed to a disaster or war one day**
50% said yes, may be the many wars the country had gone through is the driver of such answer. Some still believe that their cities are beyond the scope of natural disasters.

This respectable percentage makes sense to have an advanced plan. While the previous answers indicated that there is no real seriousness in this matter.

i) **Priority response (plan, funding and human resources).**
30% answered that there must be a plan to work on it first and foremost. 40% responded that there is a need for funding first. The remaining 30% of the responses indicated the urgent need for human resources capable of performing work according to plan and with sources of funding.

j) **Reasons for not having a post – disaster plan**
50% said as a result of lack of seriousness and 50% said it is that the country will not go through a disaster.

k) **Priority when a disaster occurs (shelter, food, drink, money)**
42% said they need shelter as a priority to live in a safe place for their families and preserve their dignity, and 39% said it is necessary to get enough food and drink first of all. While 19% pointed to the need to have enough money to give them the freedom to act by moving to other more secured places.

2nd practical part
11. **A comparative study of international experiences**
The researcher conducted a study on the relationship of precautionary measures and its inclusion in the national plans to measure the response and its effectiveness and the amount of damage caused. In this context, the researcher wanted to collect information on a group of experiments of countries whose cities were subjected to natural disasters or wars to measure variables by simple linear regression model. Standards have been developed and compared to the extent of destruction.

A group of countries (10 trials) were selected, which underwent a large number of catastrophic trials. The magnitude of the damage was measured by reports received after the disaster. A set of criteria and
variables that were subsequently reduced were applied to a single variable called preparedness, which included plans on national basis, an informed infrastructure, social awareness of good behaviour before and after the disaster, and the ability to return to normal, taking into account the scale and impact of the disaster.

The results indicated that most of countries that benefited from their previous experiences improved their level of response and included plans in advanced stages to avoid improvisation and random confusion in the qualitative response in the disaster phase and the resulting crises that are difficult to get out of. The earthquakes of Chile and Haiti in 2010 were very close in intensity and impact area. But Haiti has suffered a lot, lost thousands of its citizens and damaged its infrastructure enormously because of its weak infrastructure and weak financial and planning resources. While Chile lost a few hundred citizens and the government and other institutions were able to provide an advanced response to the disaster area.

The two cases show the different readiness and response in both cases. Where the earthquake struck Haiti in 2010 and the country was not prepared for such a disaster, causing a major collapse in infrastructure and the fall of many civilian casualties. While when Hurricane Katrina in the United States in 2005 happened, the tactical capabilities before and after the disaster were to some extent ready to respond to such a situation. The different is clear between the type and arrangement of tents provided to affected civilians as compared with the case of Haiti.

Important countries such as China, one of the world's most vulnerable to natural disasters, have developed a quantitative measure of the magnitude of losses that could be experienced in the event of disaster, which should not exceed 1.5 percent of gross national product.

The study also showed that the training of the population and the development of their cooperation and organization capabilities helps the responding institutions to achieve better results at all stages of the disaster, which ultimately leads to a reduction in loss of life and property. The criteria included:

- Presence of disaster preparedness plans
- The existence of infrastructures that take account of disaster preparedness
- Community awareness
- Resilience
- Disaster size

Table 1. measures of the effect of application of criteria and their relation to the extent of destruction resulting from the disaster

| Criteria          | Weight from 1-5 |
|-------------------|-----------------|
| Origin of Earthquakes | Haiti Earthquake 2010 |
| Existence of pre-disaster plans | 3.5 |
| Infrastructure Quality | 4.2 |
| Social Awareness | 2 |
| Resilience | 4.2 |
| Disaster Magnitude | 3.9 |

Source: Researcher
The result was the regression of the simple regression $Y = 1.31 - 0.023X$ indicating an inverse relationship between the level of preparedness and the degree of damage obtained from the disaster. Where the more readiness and inclusion in the plans, the less damage occurred, and this is the basis of the hypothesis of this research.

Using the Lowest Square Method, we obtain the equation $Y = 0.97 - 0.012X$ and the correlation coefficient is 86%. The values of $a$ and $b$ were extracted by the equations:

$$a = \frac{(\sum X^2)(\sum Y) - \sum X \sum XY}{n \sum X^2 - (\sum X)^2} \quad b = \frac{n \sum XY - (\sum X)(\sum Y)}{n \sum X^2 - (\sum X)^2}$$

The regression equation is according to the following diagram.

**Figure 2.** Relationship of the applied criteria / damage ratio
Source: Researcher, based on the field survey

**Figure 3.** Criteria Vs Damage
Source: Researcher, based on the field survey
12. Summary
The reduction of disaster risks is of increasing importance because of increased disasters and associated crises. Nations with both poor and rich potentials are under threat. But developed countries have better preparedness, making them better positioned to respond.

The lack of potentials may not be a justification for falling into the trap of catastrophic outcomes, as we know that some countries are starting to mobilize the potential of local and benefit from the experiences of developed countries. Countries such as Indonesia, Mozambique and Sudan do not have significant assets at the regional economies but have adopted global experiences and have taken precautionary measures stemming from plans to reduce damage, community participation, early preparedness and availability of technical expertise.

The biggest challenge of disaster response is funding and how to get resources to restore normalcy and secure relief operations, but even the existence of significant funding possibilities cannot eliminate the role of proactive plans that ensure the best utilization of available financial resources.

Large-scale natural disasters, especially in fragile states and developing countries, can lose years of development achievements. While we cannot completely stop disasters in the future, we can learn from every disaster so that when we rebuild we reduce the specific vulnerabilities.

13. General Conclusions
1- Advance planning is an important factor in disaster preparedness, although it is difficult to predict the type and magnitude of the disaster and the time it occurs.
2- There is a global trend towards uniting efforts to reduce the impact of disasters through international and regional conferences and conventions
3- Experiences of countries continuing to deal with disasters, many of which gained experience and good conduct. Some countries have improved their response to disaster recurrence, such as Mozambique, Indonesia and China.
4- Cities that take precautionary measures, maintain the sustainability of infrastructure and resources and the preservation of the lives of residents are cities that become attractive, vital and able to manage future investments

14. Special conclusions on the practical part: questionnaire
1- A significant percentage indicated the existence of a government allocation, but also showed the lack of integration and clarity in the mechanism of disbursement.
2- Lack of technical implications and safety factors in constructions because of the costs incurred.
3- Poor citizen's awareness of how to behave during the disaster and the weakness of the mechanisms of personal planning and individual action.
4- Some institutions have earmarked funds with no plan to spend them.
5- Priorities of the population in emergencies and disasters are shelter, food and money.

15. Conclusions of States' experiences
1- The speed of response and prevention of risks clearly indicated an improvement compared to the experiences of countries did not consider these changes.
2- Rehabilitation and training of communities has an effective impact on response and reduction of losses.
3- Utilization of global experiences and affiliation under the signed agreements contribute to improving the mechanisms of preparedness.

16. Recommendations
1- Adopting disaster and crisis planning plans within future national plans
2- Developing the early warning system and adopting transparency in the delivery of information to the public
3- Participate in the work of regional and international institutions with a view to developing disaster risk reduction mechanisms and benefiting from experiences in the development of response
4- Establish specialized bodies and institutions that monitor the development of crises, check the possibility of exposure to disasters and propose solutions and transitions for all phases of crisis or disaster.
5- Allocating funds and seeking to protect these allocations for use in the event of a disaster
6- Provide trained human resources for immediate response
7- Develop the resilience of communities - especially those exposed to disaster risk - to develop personal plans and realistic assessments in case of crises
8- Increase public awareness of good behavior and commitment to instructions and calmness.
9- Include and activate using safety factors in construction designs and according to technical specifications

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