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Management solutions in field impacts of flood and erosion on environmental pollution

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According to statistics prepared by the United Nations have entered most losses and damage to human societies among the natural disasters, floods and storm. Since the floods every year are causing loss significant of life and financial, the main aims of planning in this area are flood control and mitigation. The aim of this study is to instigate the effects of flooding and erosion on environmental pollution management options in this field. In this review study, the literature was done from 2000 to 2020 in various databases, including Medline, Web of Sciences (WOS), Google Scholar and Scopus. Data's was collected based on available reviewed articles. The Expanded Disability Status Scale (EDSS) was evaluated for effectiveness and the effects of the studies were evaluated for safety. After processing and modification on the basis of data collected, estimated the effects of flooding and erosion. The environmental impact caused changes in watershed physical, changes in shape and topography of the area influence erosion and brought in sediment, soil erosion; change the biological characteristics of water. The main effects of this including the water borne diseases such as typhoid, cholera, and create the appropriate environment for the growth of hosts and vectors of some diseases such as Schistosoma, Malaria
Finally, the findings of this study showed that the pollution due to by flood can be caused toxic acceptor waters, high PH of this water and reducing dissolved oxygen. Measures taken to reduce the effects and risks of erosion is: the correct and appropriate use of land, establishment of appropriate vegetation, soil conservation through crop management and plant residues in the ground or putting mulch sprayed.

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Introduction

Environmental pollution because of the entry of hazardous pollutants into surface water, groundwater, soil and the environment are among the most important threats to human, animal, aquatic and environmental health (Hassani et al., 2016; Naghizadeha, Kamranifarb, Yaric, & Mohammadid, 2017; Neisi et al., 2017; Niri et al., 2015; Soltani et al., 2017). Floods and soil erosion are among the most important ways of importing pollutants into surface and groundwater (Boardman & Vandaele, 2010).

United Nations (UN) reported that floods and hurricanes have caused the most damage to human societies, with flood damage reaching $ 21 billion in just one decade, while earthquakes causing damage has been about 18 billion (Doocy, Daniels, Murray, & Kirsch, 2013; Jonkman, 2005). Floods are causing loss significant of life and financial, the main aims of planning in this area are flood control and mitigation (Bertilsson et al., 2019; Y.-R. Chen, Yeh, & Yu, 2011; Tariq & Van De Giesen, 2012). Flooding is one of the main devastating natural hazard in Asia especially Iran and the recent flooding has demonstrated its severances (L.-C. Chen, Liu, & Chan, 2006; Tariq & Van De Giesen, 2012).

Since floods cause significant loss of life and property every year, flood control and risk reduction is one of the most important planning goals in this field (Adedeji, Odufuwa, & Adebayo, 2012; Bertilsson et al., 2019; De Bruijn & Klijn, 2009). Based on result different study the most important causes of floods are including changes in land use, the predicted impacts of climate change and increasing urbanization (Douglas et al., 2010; Penning-Rowsell, Ashley, Evans, & Hall, 2004).

Human beings need food that is obtained from the existence of water and soil (De Groot, Wilson, & Boumans, 2002; Wallace, 2000). The factor that endangers the existence of water and soil is erosion, which always acts to destroy soil (Granged, Zavala, Jordán, & Bárcenas-Moreno, 2011; Montgomery, 2007). Erosion is an inevitable phenomenon and it cannot be completely eliminated, but human activities can intensify or reduce soil erosion (Montgomery, 2007). Erosion is a permanent phenomenon and will always be there, but it is not critical if it is less than the amount of soil formed (Nearing, Foster, Lane, & Finkner, 1989). The erosion process mainly consists of two parts: loosening of soil particles due to raindrops, freezing, ice melting and transfer of soil particles by rainwater flow, and its types include: scattering erosion, scouring, furrow erosion, waterway erosion is canal erosion, weather erosion (Callaghan, Ranasinghe, & Roelvink, 2013; Cerdan et al., 2010; Wang, Steiner, Zheng, & Gowda, 2017).

According to the above, management options in field impacts of flood and erosion on environmental pollution, despite numerous studies in the field of management options in field impacts of flood and erosion, there were not many review studies in this field, so the present study aims to compare the effectiveness and observance of flood and erosion on environmental pollution in studies conducted worldwide. Done. The findings of this study can provide good evidence for further use of management options in helping prevention flood and erosion.

Material and methods

Search strategy

A review of the literature was conducted on references available in various databases: Google Scholar, Elsevier and Science Direct. Search restrictions included English language, years of publication 2000–2020.

Data collection method

The bases were searched by two people and independently. Possible disputes were resolved through discussion with a third party. Basic data needed for the study to be analyzed, including data on the author's name, environmental pollution, year, place of study, how to measure the data, method of design, as well as information on management options in field impacts of flood and erosion was collected. Based on the explanations provided during the search, 108 articles were found and after review and final evaluation, 11 articles were entered into the analysis stage and finally 7 articles were selected. Other articles were excluded from the study due to lack of one of the desired entry and exit criteria, failure to provide correct information, duplication of results and addressing other plant effects.

Extracting the data

Two authors extracted the data independently. After selecting the studies based on the study criteria, the following data were extracted. Name of the first author, year of publication, country of study, flood, erosion, environmental pollution and Management options, outcomes and reported complications were extracted.

Result

Based on studies on the Management options in field impacts of flood and erosion on environmental pollution, including articles published in domestic and foreign journals and searches in Web of Sciences database 50 articles, Science Direct received 31 articles and 85 articles in the Google Scholar search engine. Deletion of 37 articles and deletion of 11 articles During the secondary studies, finally 7 articles entered the analysis process (Boardman, Vandaele, Evans, & Foster, 2019; Dawson et al., 2009; Deasy, Titman, & Quinton, 2014; Hudson, Middelkoop, & Stouthamer, 2008; Posthumus, Deeks, Rickson, & Quinton, 2015; Wheater & Evans, 2009; Williams, Rangel-Buitrago, Pranzini, & Anfuso, 2018). The selection process for the studies is shown in Figure 1.

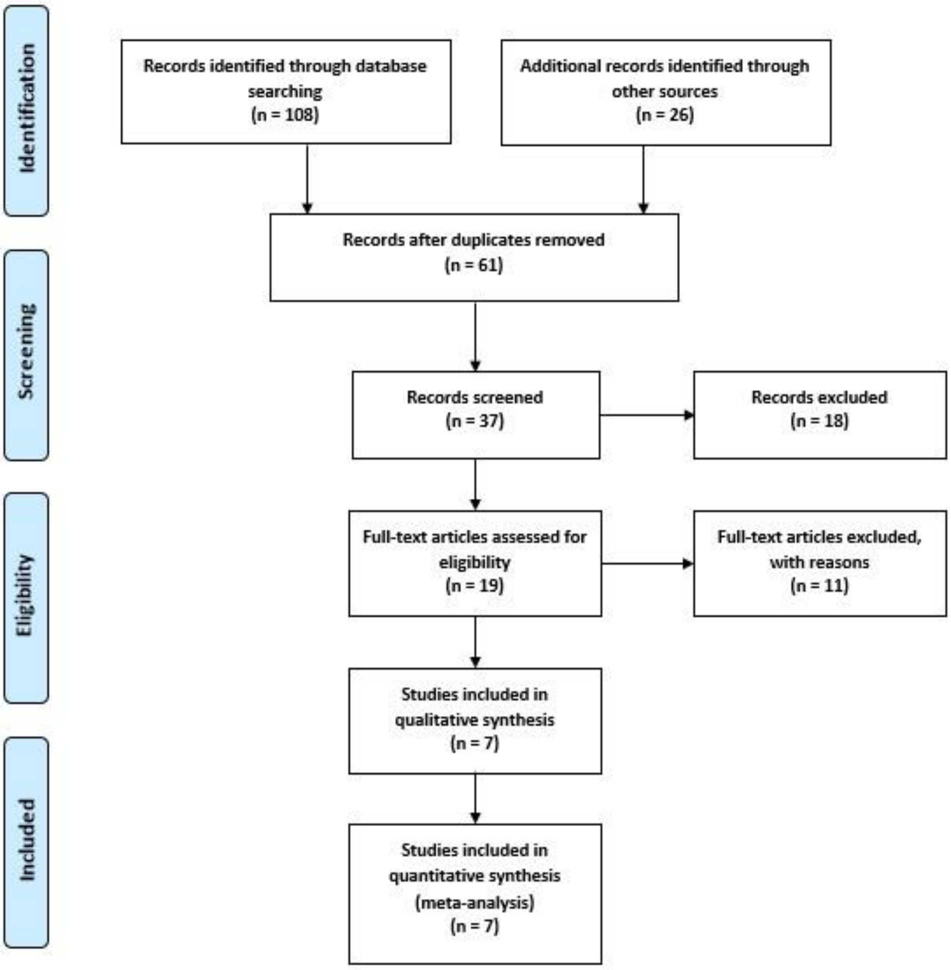

Figure 1: Flowchart of study entry steps for the studies

Discussion

The findings of this study showed that the responsibility of the consequent impacts of flood and erosion are by several different agencies.

This study had some limitations. The number of studies selected for analysis was small, so more studies on management options in field impacts of flood and erosion were needed for a stronger comment. Despite a number of further studies, more valuable evidence is provided to judge the widespread impacts of flood and erosion on environmental pollution. The selected studies were in English only and therefore other studies may have been published in another language that may influence the findings of these studies. In addition, the difference between management options can also affect the findings.

Flood risk is dangerous for human populations, terrestrial organisms, aquatic animals, the environment, the marine environment and all livestock in floodplains (Affonso, Barbosa, & Novo, 2011; Hossain, 2001).

The most important adverse effects of flood and soil erosion are Deaths from drowning or burial under rubble and the destruction of buildings, the spread of infectious diseases including water-borne diseases (such as typhoid, cholera), the creation of suitable environments for host growth and transmission contributors of some diseases (such as schistosomiasis and malaria), complete destruction of agricultural lands, destruction of crops, destruction of pastures, damage to industries and related services, destruction of canals, damage to pumping stations, destruction of diversion dams, reduced soil fertility, loss of clay in the soil, loss of organic matter in the soil, reduced investment in flood-prone areas, damage to the flooded area due to the destruction of infrastructure, costs imposed on the medical sector to transport the injured, the cost of treatment and construction of emergency clinics, damage to the transport network (roads, bridges and railways), reduced production in the industrial sector and factories in the flooded area (Cissé, 2019; Dhara, Schramm, & Luber, 2013; Elsheikh et al., 2013; Golchin & Asgari, 2008; Jonkman & Kelman, 2005; McCreesh & Booth, 2013; Nemry & Demirel, 2012; Neumann et al., 2015; Patz, Graczyk, Geller, & Vittor, 2000).

Fear of losing the lives of people in the community, feelings of insecurity, social unrest, intimidation, migration from flooded areas and suffers from soil erosion are another adverse effects of flood and soil erosion. Flood and soil erosion management in order to reduce the risks and effects of this phenomenon refers to the pervasive processes in flood control that moderate the spread of floods and the damage caused by it, but full protection against floods and soil erosion both technically and economically and biologically.

The most important actions in the management and reduce the occurrence of flood and soil erosion control including the operation of reservoirs to control floods, use of reservoir capacity to store, routing and regulation of flood discharge, rehabilitation and use of wetlands for use in times of floods, keep down Having flood height is storing and collecting part of the water flow by trees and plants in the wetland along the coastal areas, using new agricultural methods and techniques for temporary storage of flood water and turning farms into forests and planting trees, grass in areas without vegetation, proper and appropriate use of land, preservation of vegetation and plants in the area, prevention of uncontrolled excavation and digging of natural lands, agricultural management, use of appropriate fertilization methods and plowing methods, construction of small stone dams in deeper and wetter areas of the basin.

Conclusion

In field of Management options flood and erosion a setup consisting of organizations, legislation, and measures is implemented. Analyzed and optimized are action in order to reduce the destructive environmental effects of floods and erosion. It actions is a very important that should be considered by governments.

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