LUX MENSANA **Volume 1, Issue 4, 2022**
Page. 240-250

Original Research Article

THE ROLE OF COMMUNITIES LIVING IN WATERSHEDS TOWARDS FLOOD DISASTER MANAGEMENT : SYSTEMATIC REVIEW

Heri Suroso[1)*], Loeki Enggar Fitri[2], Yati Sri Hayati[3]
[1]STIKes Adi Husada, Surabaya, Indonesia
[2]Department of Parasitology, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia.
[3]Master Programs of Nursing, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia.
*Corresponding Author, E-mail : Herisos39@gmail.com

ABSTRACT

Introduction. Disaster is a series of events that can threaten and disrupt human life, caused by natural and non-natural factors. A flood disaster is a natural disaster that can occur due to extreme storms in the upper watersheds, climate change, and geomorphological conditions of soil slopes, erosion, and sediment material. Flood disasters will have an impact on the social situation, people's economy, health status and death. **Method.** A systematic review was conducted through several stages, namely making questions, identifying, eligibility, selecting article inclusions, screening, and appraisal. The selection process was listed in the Systematic review framework and 10 articles are obtained. Later, articles were summarized and rated according to The Joanna Briggs Institute (JBI) in each article**. Result&Analysis.** The data shows that the results vary according to the system, and the conditions in which the study was conducted. Increasing the role of the community in flood disaster management efforts is done by increasing community knowledge, skills and experience, related to an efficient disaster management system, with several methods, namely by giving questionnaires and conducting interviews with the community or family, special training and simulations. **Discussion.** To increase the awareness and role of the community in managing flood disaster, several methods are applied. The simulation method is an educational effort that can be used to improve people's knowledge, skills, and experience in conducting flood management activities.

Keywords: Role Community, Disaster Mitigation, Flood.

INTRODUCTION

Community life will not be free from disaster. Law of the Republic of Indonesia Number 24 Year 2007 Article 1 Paragraph 1 concerning disaster management, states that a disaster is a series of events or events that can threaten and disturb human life, caused by natural and non-natural factors. Floods are social-natural disasters that require serious attention, because they can cause casualties, environmental damage, property losses, and psychological impacts (Rehman *et al.*, 2019). Asia is a continent that is vulnerable to natural disasters, one of which is that floods have

occurred over the last few decades (Rehman *et al.*, 2019).

Indonesia is recorded as one of the countries that have flood-prone areas, nationally 77% of disasters occurred were hydrometeorological disasters, and in 2005-2015, more than 78% of hydro meteorological disasters. The flooding incident in Jakarta in January 2013 resulted in 40 deaths, 45,000 people lost their homes, substantial material damage and caused a loss of 15 billion rupiahs, while in 2014 the loss reached Rp100 million per day (Asdak, Supian and Subiyanto, 2018). The impact of disasters occurs due to lack of community capacity and social systems to manage threats to disasters (UNDP, 2014). Communities living in disaster areas are the biggest victims of disasters, as well as people who live in watersheds at risk of flooding (Kementrian Pekerjaan Umum, 2013). The main role of the community in disaster risk reduction is to form community organizations for disaster preparedness, which are in accordance with the Head of National Disaster Management Agency Regulation No. 1 of 2012, concerning general guidelines for Strong Disaster Village. This guideline explains the provisions regarding the formation of a village disaster risk reduction organization and the community disaster preparedness team.

Disaster prevention is an effort to reduce disaster risk by carrying out mitigation and preparedness activities. Disaster mitigation is the reduction of disaster risk through physical development, community awareness and capacity building to deal with the threat of disaster by establishing disaster-prone zones and building construction in accordance with government regulations (Law No. 24 of 2007, Chapter I General Provisions, Article 1 paragraph 6 PP No 21 of 2008 concerning Implementation of Disaster Management (Kurniati, Trsyani and Theresia, 2018). The purpose of this systematic review is to find out the role of communities living in watersheds towards flood disaster management.

METHOD AND ANALYSIS

The preparation of this review through several stages, namely making a research question in accordance with the PICOS method (Problem, Intervention, Comparison, Outcome and Systematic), then conducts a literature review using diagrams PRISMA. Journal identification is done by searching journal articles in three databases, Proquest, Pubmed, and Science Direct, published between 2010-2019, using English. The keywords used by the authors in this systematic review are 12 keywords in each database, Role,

Duty, Community, Public, Society, Family, Disaster Management, Disaster Risk Management, Disaster Mitigation, Flood, Overflow, Watershed. The author combines keywords with conjunctions (And). The selection of articles must be carried out a selection process based on the existing inclusion and exclusion criteria. Inclusion criteria include: there are research articles, dissertation articles or theses that describe flood disaster management, flood risk reduction, the role of the community in flood disaster management and articles using only English. Exclusion criteria, namely the article's focus on hospital services, the method of the article is a systematic review and related articles, cannot be read and cannot be edited. At this stage the authors summarize the article and make an assessment based on the Joanna Briggs Institute (JBI) checklist on each article in accordance with the method of the article. The assessment results are attached in table 1.

RESULT

The results of the systematic review obtained 10 international articles based on the Joanna Briggs Institute (JBI) checklist and inclusion criteria in each article according to the article method. Journal identification is done by searching journal articles in three databases, Proquest, Pubmed, and Science Direct, published between 2010-2019, using English. The results of the 10 articles have nothing in common with other articles, so the 10 articles will be reviewed more deeply regarding the methods and research results of the articles.

DISCUSSIONS

The community has the biggest role in carrying out the disaster management system program. This is in accordance with Law of the Republic of Indonesia Number 24 of 2007 concerning Disaster Management, and Government Regulation Number 21 of 2008 concerning Implementation of Disaster Management. The government, the community, and several institutions in the regulation have roles and same responsibilities related to disaster management strategies. The main role of the community in disaster risk reduction activities is to create community organizations for disaster preparedness, which are in accordance with the Head of Disaster Management Agency Regulation No. 1 of 2012, concerning general guidelines for Strong Disaster Village. This guide explains the provisions regarding the formation of a village emergency financial institution, and a community disaster emergency team.

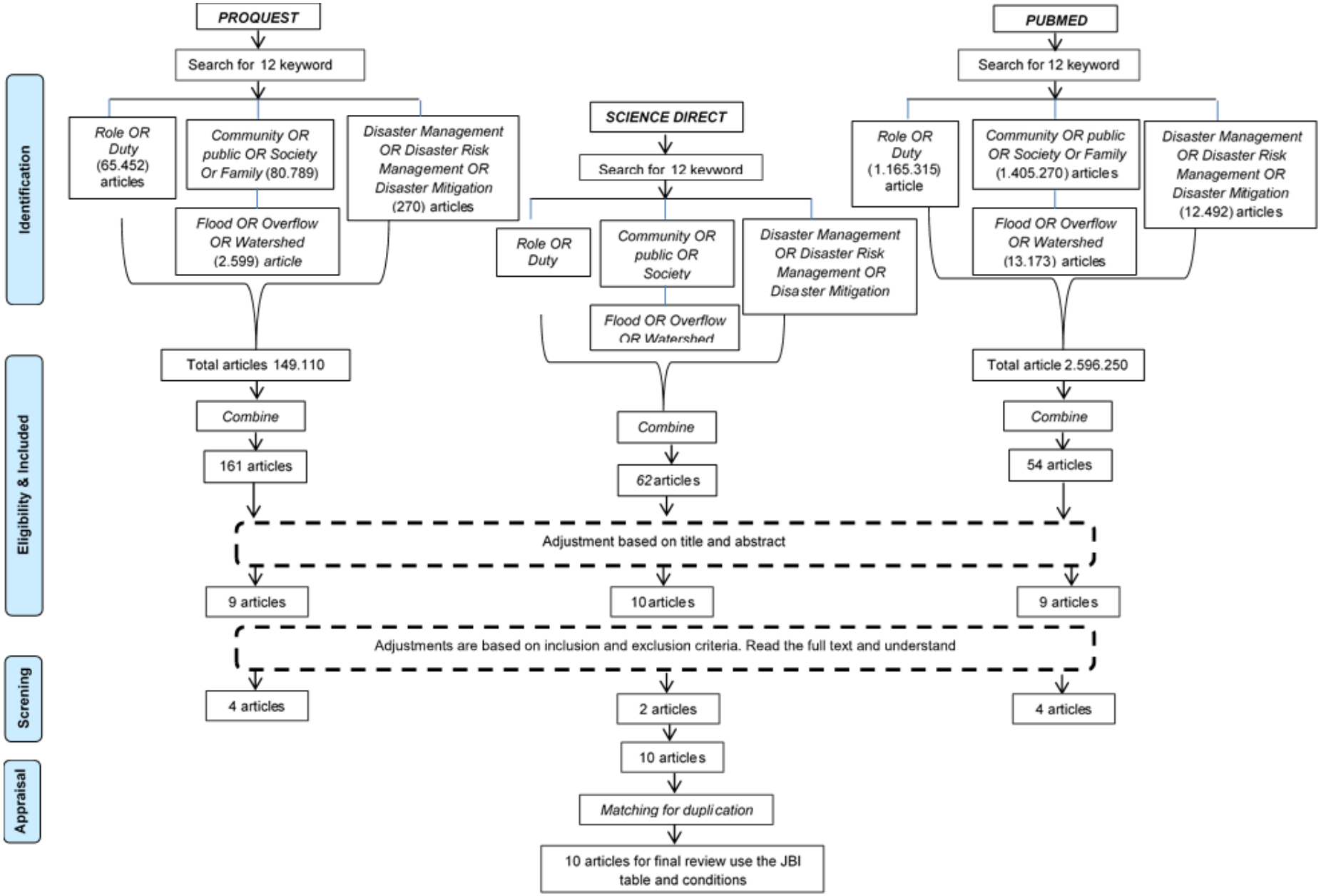

Figure 1. Systematic Search Framework Review

Based on the results of research conducted by (Adams, Eisenman and Glik, 2019) with the title "Community Advantage and Individual Self-Efficacy Promote Disaster Preparedness: A Multilevel Model among Persons with Disabilities", identify community factors in an effort to improve disaster preparedness, and in order to be able to implement community resilience behavior towards disasters faced by the disasters people with disabilities, and strengthen the capacity of the whole community to respond and recover from disasters. This research was conducted using descriptive cross sectional survey, by giving questionnaires to respondents to determine the relationship of respondents to disaster preparedness and response. Results of a study of 4,700 respondents based on self-efficacy mediation analysis and efficacy responses to the relationship between disability and disaster preparedness, found that poor health was associated with lower self-efficacy, with a value (B =-0.25, $p<0.01$) and the effectiveness of the response (B =−0.06, $p <0.01$).

According to (Dube et al., 2018) with the title of research "Managing flood disasters on the built environment in the rural communities of Zimbabwe: Lessons learned", the purpose of this study is to determine the impact of flood disasters on the built environment, to limit the factors causing community vulnerability to flood disasters and to illustrates the challenges that hamper the management of flood disasters in the built environment. The study was conducted using qualitative studies with phenomenological and interpretive methods with a total of 40 participants from community members. The study was conducted with semi-structured interviews and observation methods in gathering information related to the impact of flooding. The analysis used is a thematic analysis that functions to analyze data, with research themes derived from literature reviews. The results of the study of 40 respondents showed different views on the impact of floods, namely poverty and the cost of infrastructure development, lack of cooperation between the community and the task bearer, as well as cultural factors, and community knowledge can hamper flood disaster management.

According to research by (Mcewen et al., 2017) with the title 'Learning for resilience': Developing community capital through flood action groups in urban flood risk settings with lower social capital, the purpose of this study is to determine the effectiveness of community participatory cooperation models in building effective flood action groups in Indonesia. This study has a qualitative design with observational descriptive studies design,

and as many as 10 participants were divided into 2 groups. Participants come from residents who live in areas that are vulnerable to the risk of recurring floods with members of the flood group and flood risk management institutions by conducting semi-structured interviews with a duration of 1 hour and observation of vulnerable groups at risk of repeated flooding. Descriptive statistics using QSR-Nvivo software, with the results of the study showing that the community has a group in effective flood action in Indonesia still has a good value on developing local knowledge, skills and communication. The normalization of group members in the participatory process in this process continues to fail with the group and the perspective of flood risk management agencies.

Azmeri and Isa (2018) with the research title "Community resilience to floods in the coastal zone for disaster risk reduction", the purpose of this study is to determine the level of vulnerability of flood zones, the level of community resilience to flooding and the influence of aspects of vulnerability to community resilience. This research was conducted using descriptive cross sectional survey, by giving questionnaires to respondents to determine the effect of respondents on the level of resilience of coastal communities to flood disasters. The results showed that the level of resilience of coastal communities to flooding was influenced by the variable adaptive capacity (sig. 0.007) and the exposure variable (sig. 0.071). The biggest variable that determines community resilience is damage, followed by community losses, both personally and in groups. Among the aspects of flood vulnerability are exposure and adaptive capacity that determine community resilience on the north coast of Central Java.

According to the research of Shariff, Hamidi and Shariff (2019), with the research title "Community-based approach for a flood preparedness plan in Malaysia" the purpose of this study is to determine the importance of developing a flood preparedness plan by involving the community. This study uses a qualitative study design with phenomenographic and interpretive methods with a total of 40 participants from community members. This research was conducted with semi-structured interviews about experiences before, during and after, and observing their preparations in the village by conducting observation methods in gathering information related to the impact of flooding. The analysis used is a triangulation technique, which is to carry out an assessment of 6-10 months of preparation before the floods which are expected to occur in December 2016. The

results of the study indicate that there are two important things that must be done by the community in making preparations, namely community-based disaster risk management and lead assistance intensive turning. The community-based approach to flood preparedness plans depends on the frequency of the flood, the severity of the flood, the type of preparedness plan for each social unit for the whole village which may differ slightly from families or individuals, and community awareness about the dangers of floods that are influenced by community or individual knowledge and experience of flood disaster risk management. A flood preparedness plan must meet specific objectives, namely solving problems without competition, bridging gaps and taking a holistic approach.

According to Cvetković et al. (2018) with the research title "The Role of Gender in Preparedness and Response Behaviors towards Flood Risk in Serbia", the purpose of this study is to find out the socio-demographic of the community, assessing social background, gender, risk awareness, preparedness, rescue management, and information and education assistance. This research has a quantitative design with a cross-sectional descriptive design, with 2500 participants who are members of the community affected by the flood disaster. The study was conducted by giving questionnaires to respondents who had participated. Statistical analysis of the data used is the statistical package for social science (SPSS), programs (SPSS 20, IBM, Armonk, NY, United States). A 'gender' variable was tested to validate a central hypothesis using multivariate analysis and a Chi-square test was performed. The results showed that there were significant differences between the roles of men and women. Men are better prepared and more active or willing to be involved in disaster management activities led by community level activities. Women lack confidence in disaster management, but have a more realistic view of temporary preparation, more awareness, concern and preparedness behavior at the household level.

According to Nii, Codjoe and Danaa (2016) with the title of the research "Cultural dimensions and adaptation to floods in a coastal settlement and a savannah community in Ghana", the purpose of this study is to analyze information about the cultural dimensions and family adaptation options in dealing with floods in the future. This research has a quantitative design with a cross-sectional descriptive design, with 100 families participating in the savanna (Dungu) community and 134 families participating in the coastal settlement

(James Town) in Ghana. The study was conducted by giving questionnaires to respondents who had participated. Analysis of the data used in this study is to use a Likert scale. The results showed that first, there was an imbalance between the rank and structure of traditional hierarchical governance in Dungu relatively lower than in James Town, secondly, there were differences that were more beneficial to men than women in carrying out disaster management in Dungu, third, the existence unstructured rejection and unexpected situations in both communities, fourth, participants in both communities are currently willing to sacrifice time and resources to achieve a better life in the future, and fifth, community members in Dungu consider themselves to be a unit, and will do their best to carry out disaster management related to future flood disasters.

According to Scolobig, Pellizzoni and Bianchizza (2016) with the research title "Public Participation and Trade-Offs in Flood Risk Mitigation", the purpose of this study is to analyze various community approaches in making decisions on flood disaster mitigation by comparing two experiences related to flooding. This study has a qualitative design with a case study of observational descriptive studies, with a total of 102 people participating in the Malborghetto-Valbruna community and 186 from the Vipiteno-Sterzing community. The study was conducted with semi-structured interviews and observation methods in gathering information related to decision making on flood disaster mitigation. The analysis used is a thematic analysis that functions to analyze participant data related to information in community flood mitigation decision making. The results showed the participants' responsiveness to the institutional needs and expectations of citizens, the capacity to harmonize various views and types of knowledge in development in determining flood mitigation options.

According to Subandi et al. (2019) with the research title "Training on modified models of programs for enhancement of emergency response flood preparedness based on the local wisdom of Jambi community ", the purpose of this study was to determine the effectiveness of training for flood preparedness based on local wisdom to improve the knowledge, abilities and skills of people in disaster prone areas. This research is an experimental study with a pre-and post-test control design, with 24 participants who are members of the community. This research was conducted by giving questionnaires to respondents who have participated in flood disaster preparedness training based on local wisdom. Analysis

of the data used is to use the T Test, to determine the results of the control group and the treatment group. The results of the research post-test showed an increase with an excellent score of 75% or a coefficient value of 71.4 ($p < 0.005$) of skills in the final simulation by using a modification of the program model to increase emergency response based on local wisdom.

According to Dwirahmadi et al. (2019) with the title "Understanding the Operational Concept of a Flood-Resilient Urban Community in Jakarta, Indonesia, from the Perspectives of Disaster Risk Reduction, Climate Change Adaptation, and Development Agencies", the purpose of this study was to determine the role of the community resilience to floods through the observation of three main stakeholder groups: disaster risk reduction (DRR), climate change adaptation, and infrastructure development. This research is a study that uses a mixed methods approach using quantitative and qualitative methods, with a total of 221 people who are participants. This research was conducted by conducting semi-structured interviews and giving questionnaires to participants. Data analysis in qualitative research uses thematic analysis, whereas quantitative research uses simple descriptive statistical analysis (percentages) used to describe the results. Data frequency was calculated to determine response characteristics regarding features and barriers to community resistance to flooding. The results of this study indicate that there is a common view of the importance of the human aspect at the center of resilience development efforts.

CONCLUSION

Based on the 10 results of this study it can be concluded, that in increasing the role of the community in managing disaster risk is to increase knowledge, skills and experience of the community related to an efficient disaster management system, so as to foster public awareness in managing disaster risk properly. As for several methods that can be applied in knowing the role of the community in disaster management, namely the method of education and special training for people who live in disaster prone areas, such as giving questionnaires and conducting interviews with the community or family to find out the level of knowledge skills, and related community experience disaster management during flood disaster, the simulation method is an educational effort that can be used to improve the knowledge, skills and experience of the community in carrying out flood management activities. So that it raises

awareness for the public against the dangers of flooding, and can change the willingness and volunteerism of the community in carrying out flood disaster management.

REFERENCES

Adams, R. M., Eisenman, D. P. and Glik, D. (2019) 'Community Advantage and Individual Self-Efficacy Promote Disaster Preparedness: A Multilevel Model among Persons with Disabilities', International Journal of Environmental Research and Public Health, 16(15), pp. 1–18. doi: 10.3390/ijerph16152779.

Asdak, C., Supian, S. and Subiyanto (2018) 'Watershed management strategies for flood mitigation: A case study of Jakarta's flooding', Weather and Climate Extremes, 21, pp. 117–122. doi: 10.1016/j.wace.2018.08.002.

Azmeri, A. and Isa, A. H. (2018) 'An analysis of physical vulnerability to flash floods in the small mountainous watershed of Aceh Besar Regency, Aceh province, Indonesia', Jamba: Journal of Disaster Risk Studies, 10(1), pp. 1–6. doi: 10.4102/jamba.v10i1.550.

Cvetković, V. M. et al. (2018) 'The role of gender in preparedness and response behaviors towards flood risk in Serbia', International Journal of Environmental Research and Public Health, 15(12). doi: 10.3390/ijerph15122761.

Dube, E. et al. (2018) 'Managing flood disasters on the built environment in the rural communities of Zimbabwe : Lessons learnt', Journal of Disaster Risk Studies, 10(1), pp. 1–11. doi: https:// doi.org/10.4102/jamba. v10i1.542.

Dwirahmadi, F. et al. (2019) 'Understanding the Operational Concept of a Flood-Resilient Urban Community in Jakarta , Indonesia , from the Perspectives of Disaster Risk Reduction , Climate Change Adaptation , and Development Agencies', Journal of Environmental and Public Health, 20(16), pp. 1–24. doi: 10.3390/ijerph16203993.

Kementrian Pekerjaan Umum, I. (2013) Pedoman Analisis Harga Satuan Pekerjaan Bidang Pekerjaan Umum. doi: S1043-4666(08)00197-X [pii] 10.1016/j.cyto.2008.07.001 [doi].

Kurniati, A., Trsyani, Y. and Theresia, S. I. M. (2018) Keperawatan Gawat Darurat dan Bencana Sheehy. 1 Indonesi. Singapore: Elsevier Ltd.

Mcewen, L. et al. (2017) '"Learning for resilience'': Developing community capital through flood action groups in urban flood risk settings with lower social capital"', International Journal of Disaster Risk Reduction, 27, pp. 329–342. doi: 10.1016/j.ijdrr.2017.10.018.

Nii, S., Codjoe, A. and Danaa, A. (2016) 'Cultural dimension and adaptation to floods in a coastal settlement and a savannah community in Ghana', GeoJournal. Springer Netherlands, 81(4), pp. 615–624. doi: 10.1007/s10708-015-9641-7.

Rehman, J. et al. (2019) 'Applying systems thinking to flood disaster management for a sustainable development', International Journal of Disaster Risk Reduction, pp. 1–27. doi: 10.1016/j.ijdrr.2019.101101.

Scolobig, A., Pellizzoni, L. and Bianchizza, C. (2016) 'Public Participation and Trade-Offs in Flood Risk Mitigation', Nature and Culture, 11(1), pp. 93–118. doi: 10.3167/nc.2016.110105.

Shariff, N. N. M., Hamidi, Z. S. and Shariff, N. (2019) 'Community-based approach for a flood

preparedness plan in Malaysia', Jamba: Journal of Disaster Risk Studies, 11(1), pp. 1–7. doi: https://doi. org/10.4102/jamba.v11i1.598.

Subandi, A. et al. (2019) 'Training on modified model of programme for enhancement of emergency response flood preparedness based on the local wisdom of Jambi community', Journal of Disaster Risk Studies, 11(1), pp. 1–9. doi: doi.org/10.4102/ jamba.v11i1.801.

UNDP (2014) Disaster Risk Reduction.