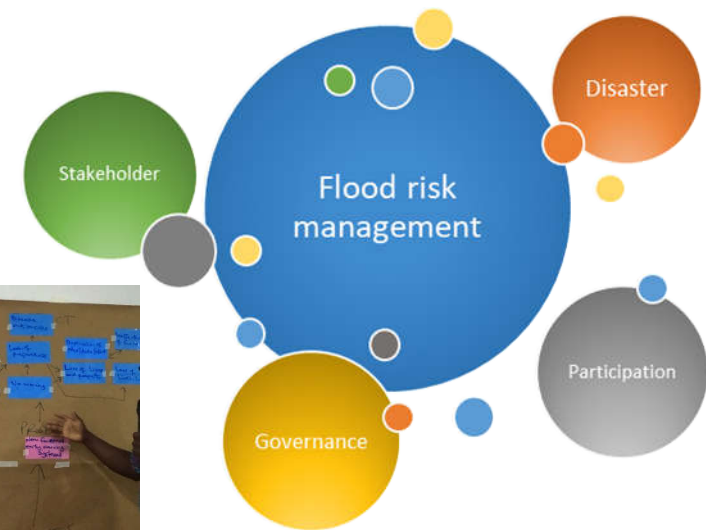


# An inter and transdisciplinary participatory approach to assess the current flood risk management practices in Ghana

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The following guiding questions with an overview of answers will guide you through the display

1	2	3	4	5	6
What is the issue?	What is our approach?	How was it implemented?	What was the outcome?	What is the value of our approach?	What do you think?
<p><i>The recurrence and impact of flood disasters in Ghana are still immense despite the existence of several FRM programs</i></p>	<p>(a) <i>An inter and transdisciplinary and participatory multi-method participatory approach</i></p> <p>(b) <i>Assessment of the social, technical and governance aspects of FRM</i></p>	<ul style="list-style-type: none"> <li>• <i>Stakeholder Workshops</i></li> <li>• <i>Institutional Interviews</i></li> <li>• <i>Household surveys</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Re-assessment of critical areas</i></li> <li>• <i>Technical, institutional, governance and human capacity weaknesses</i></li> <li>• <i>Aspects for reducing vulnerability</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Capture the factual situation of the FRM in Ghana</i></li> <li>• <i>Gain insights on stakeholders views, needs and requirements on FRM</i></li> </ul>	<p><i>Please leave a feedback to further advance our research approach</i></p>

# (1) What is the issue?

- In West Africa, Ghana is one of the countries most susceptible to floods
- Annual occurrence of major flood (e.g. in 2018, water releases from the Bagre Dam in Burkina Faso affected 100,000 people and destroyed 196 km<sup>2</sup> of fields)
- Flooding experienced in different parts of the country (fluvial, pluvial and costal flooding)
- Ghanaian government has established several mitigation strategies and policies (e.g. National Water Policy and Blue Agenda) to reduce flood impacts
- Why do flood disasters occur despite the existence of several institutional and non-institutional FRM programs?
- A need to investigate Ghana's national current flood risk management (FRM) strategy to better identify the gaps, weaknesses, and challenges



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## (2) What is our approach?

- The shortcomings on information dissemination of scientific facts and flood risk to decision makers, stakeholders and citizens in Ghana impose the need of a systematic analysis of flood prevention/management in an inter and trans-disciplinary approach.
- The following approach and methods were structured guided by questions on Ghana's FRM weaknesses and challenges on social, technical and governance.

### Approach and methods:

- Systematic literature review- using Web of Science and Science Direct databases
- Stakeholder analysis- using snowball sampling
- Online surveys- mixture of open-ended, multiple responses and Likert-scale questions
- Workshops- group discussion and use of participatory mapping, problem tree analysis and multi-criteria decision-analysis (MCDA) method
- Interviews (institutions and household)

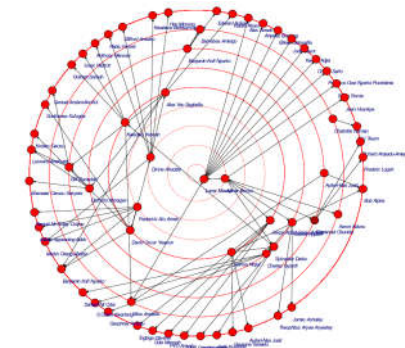
## (3) How was it implemented? (1/3)

### Systematic literature review

- For years 2009 to 2019- using search strings flood, inundation and Ghana
- Out of 165 articles queried, 53 articles were selected

### Stakeholder analysis (snowball sampling)

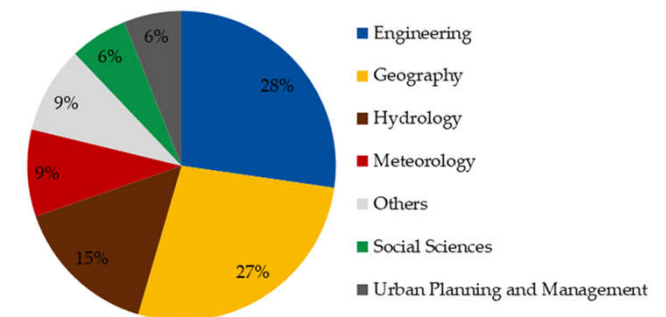
- 51 stakeholders contacted
- 33 stakeholders replied
- Developed a sociogram organized by the degree of centrality



Social network diagram depicting the linkages between the stakeholders

### Online surveys

- Questionnaires- using Survey Monkey
- Consisted of 10 questions- FRM gaps, existing measures, risk perception and flood governance structures
- 33 stakeholders participated



Online participants background

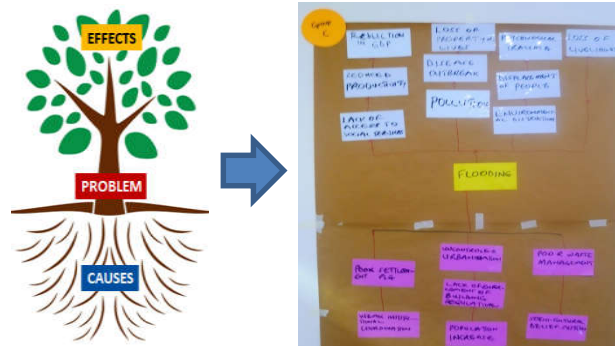
### (3) How was it implemented? (2/3)

#### Workshops

- One-day workshop in Ghana with 29 participants
- Identify critical areas using Participatory Mapping
- Identify major problems and their causal relationships using Problem Tree
- Group ranking of vulnerability and exposure criteria using cardinal ranking (CAR) MCDA method
- Group discussion about coping strategies for floods and risk governance and policy



Group discussion



Example implementation of Problem Tree



Group ranking of vulnerability and exposure

## (3) How was it implemented? (3/3)

### Interviews institutions

- To capture information, knowledge, and perception that were not shared by the key stakeholders during the workshop
- 20 key institutions interviewed. Categorized into governance and implementation, security agencies and research and academia
- Questions related to measures, scenarios, modelling, vulnerability, disaster risk, sustainability, policy and governance and human capacity

### Household interviews

- To analyse the risk perception of citizens
- Interviews in Accra, Kumasi and Northern region
- 1,469 residents in total were interviewed

## (4) What was the outcome?

- (1) the most critical regions are Accra, Kumasi, and the White Volta river basin,
- (2) the most crucial aspects for reducing vulnerability and exposure are related with high population density, social hotspots and location of Critical Infrastructure,
- (3) FRM are unsustainable and unintegrated and it heavily relies on short-term projects and external funders
- (4) reliable data is scarcely available and communities need to be engage more in the planning and provision of information and data
- (5) there are weaknesses in flood early warning systems (FEWS), institutional collaborations, human capacity, trained FRM professionals and policy implementation
- (6) the most important vulnerability criteria are the existence of FEWS, disaster relief agencies, areas with a high density of children and poverty rate
- (7) the interviewed communities in Accra and Kumasi claimed that flood disasters are caused mainly by human activities and interventions



## (5) What is the value of our approach?

- The applied participatory multi-method approach proved to be useful to capture the factual situation of the FRM in Ghana, this was shown when cross-referencing the results of the different methods.
- The use of a participatory and inter and transdisciplinary approach allowed capturing a multitude of views as well as the stakeholders needs and requirements in terms of FRM.

## (6) What do you think?

- What is your expert opinion of the presented research? We would be very glad to have your feedback to improve our approach for application to other case study.
- For further questions, inquiries and details please leave a comment or contact me [adrian.almoradie@uni-bonn.de](mailto:adrian.almoradie@uni-bonn.de)

## Abstract (1/2)

The understanding of the multifaceted nature of flood risk management (FRM) of a country requires the consideration of both social, technical as well as governance aspects. The inclusion of these components in the analysis and assessment of FRM allows comprehending the veracity of its interdependencies, its strengths and weakness that would, in turn, aid in improving the current system.

This paper presents an inter and transdisciplinary and participatory multi-method participatory approach to promptly assess Ghana's current FRM practices, describing the current gaps and opportunities for improving FRM. Here, we describe the challenges on its institutional, governance and implementation, scientific, technical and social capacity levels and potential ways forward. The methodological approach comprised a systematic literature review of 53 peer-reviewed articles, stakeholder analysis, engagement of stakeholders on workshops through focus group discussion and collaborative mapping, interviews with key individual stakeholders, and household surveys with 1,479 citizens living in flood prone areas. The stakeholders were identified and categorized into governance and implementation, academia and research and security agencies.

## Abstract (2/2)

Results show that stakeholders have diverse and even contradictory views regarding FRM in Ghana. Overall, the findings indicate that: (1) the most critical regions are Accra, Kumasi, and the White Volta river basin, (2) the most crucial aspects for reducing vulnerability and exposure are related with high population density, social hotspots and location of Critical Infrastructure, (3) FRM are unsustainable and unintegrated and it heavily relies on short-term projects and external funders, (4) reliable data is scarcely available and communities need to be engage more in the planning and provision of information and data, (5) there are weaknesses in flood early warning systems (FEWS), institutional collaborations, human capacity, trained FRM professionals and problems in policy implementation, (6) the most important vulnerability criteria are the existence of FEWS, disaster relief agencies, areas with a high density of children and poverty rate, (7) the interviewed communities in Accra and Kumasi claimed that flood disasters are caused mainly by human activities and interventions.

The applied participatory multi-method approach proved to be useful to capture the factual situation of the FRM in Ghana, this was shown when cross-referencing the results of the different methods. The use of a participatory and inter and transdisciplinary approach allowed capturing a multitude of views as well as the stakeholders needs and requirements in terms of FRM. The co-production of knowledged allowed improving the credibility, salience and legitimacy of project outputs.

This study was carried out in the PARADeS definition project financed by the German Federal Ministry of Education and Research (BMBF).