Research Proposal IIODM - Group 21

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Research Question: *How do interest gaps between stakeholders influence the decision-making process in designing AI-enabled coastal flood mitigation in the Netherlands?*

The Netherlands has quite a long history in battling coastal flood. Major events like the North Sea flood (1953) led to the development of the Delta Works defence system [1]. However, the threat of flooding will mostly increase due to climate change [2]. Recently, the use of artificial intelligence (AI) has come as an enabler to improve coastal flood prediction and mitigation efforts [3].

Despite the potential benefits, the decision-making process surrounding the implementation of the AI can be characterized as a wicked problem, because of the multi-faceted nature of the problem. Firstly, there is no single definitive solution to mitigating coastal flooding. The added use of AI gives this problem another dimension. But perhaps more importantly, the conflicting stakeholder interests cause a high degree of complexity influencing both the solution making process and the possible solutions itself. These characteristics of the problem stated above cause it to be a wicked problem, thus suited for our research question.

The decision-making process for the AI-enabled coastal flood mitigation involves several phases:

1. **Data collection**: Research data is gathered from databases NSO (the Netherlands Space Agency) and the Ministry of Infrastructure and Water Management [4, 5, 6]. Conflicts may arise around data accessibility, quality, privacy, and compatibility.

2. **Data analysis**: Experts from institutions and private companies use AI algorithms to predict potential hazard scenarios [7, 8, 9, 10]. Conflicts may emerge regarding the choice of algorithm (model), accuracy, and the result interpretation.

3. **Consultation phase**: The output (predictions) will be reviewed by stakeholders, such as municipal authorities and affected communities [11, 12]. Conflicting interests may arise during this phase, especially because of different political objectives (e.g., environmental vs. economic). Research by Tallberg et al. (2024) [13] has shown that business interests may clash with protection of rights, safety, and public interests in the context of regulatory approaches for implementing AI.

4. **Resource allocation**: Based on the flood risk analysis, the governments will allocate resources for evacuation efforts [14]. This involves coordination and negotiation with other ministries, such as the Ministry of Interior and Kingdom Relations and the Ministry of Economic Affairs and Climate Policy. Conflicts may emerge because the resources distribution and prioritization of different regions.

5. **Finally, Implementation**: If the AI models indicate a high risk of severe coastal flooding, this further leads to issuing evacuation orders through local authorities [15]. Challenges can arise in communicating the evacuation plans, coordination, and addressing public scepticism.

In our paper, we will focus on the stakeholder consultation and resource allocation (3rd and 4th) steps. These two negotiation moments are the most relevant for answering the RQ. Stakeholder consultation is important because, as stakeholders have different interests and priorities, there is a high likelihood of interest gaps arising at this stage. For example, environmental organisations may prioritise ecological protection, while local authorities and communities may be more concerned with economical impacts and evacuation logistics. Similarly, in the resource allocation step, conflicts of interest may arise as different regions compete for limited resources based on their perceived level of risk and political influence. These conflicting interests could significantly influence the decision-making process.

We plan to list all the relevant stakeholders, define the interest, and map the gap between the interests to understand the potential conflicts. The main reference mainly includes "Participatory Framework" [16], "Actors Perspectives" [17], "Democratized AI" [18], "AI Governance" [19], "AI Ethics" [20], and "AI in Flood Decision" [21]. To our best knowledge, there are small number of papers about the socio-technical challenge in using AI as a novel tool in coastal flood mitigation.

References

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Appendix: Team Contract

ITP METRICS
Growing your people and ours

Team Contract for MOT123a course
*Content adjusted from the original for the purposes of the MOT123a course
Teams are responsible to fill out any and all areas of the contract in blue below.*

Team Name: Group 21

Team Member Names:

Yuxiao Ma	Tom Vermaat
Mochammad Miftahul Fahmi	
Marie-Anne de Gier	

1. Document Purpose

The purpose of this team contract is to outline the standard operating practices and team norms of the above-named team and individually listed members for the remaining duration of the team lifespan. The guidelines outlined in this document are agreed to by all team members as indicated by their signature at the end of the contract. Any amendments to the contract must be discussed and agreed to by all signing members. Failure to abide by the outlined standard operating practices of this contract could harm the team's overall functioning and result in penalizing action as detailed in the contract.

2. Rules and Regulations

The team agrees to the following guidelines regarding general procedures, practices, and behaviours that are deemed acceptable.

A. Expectations

    i. Project Expectations
- The team is happy if we get an 8/10. But we want to work as good as possible.
- We aim to distribute the work equally. We will divide the work more extensively when the project has started.
- Be respectful of copyright, be mindful in using ChatGPT (don't just copy paste, check if contents are correct with references, etc.).

    ii. Member Expectations
- If we have difficulties, we discuss it with each other. It is okay to not understand something, not okay to not put in effort.
- We want to use references, deliver high quality work, diligence is appreciated.
- We will give each other feedback often.

    iii. Role Expectations
- We want to switch the group roles based on intermediate deadlines we will make once we have more details about the group project.

    Suggested Role:

- **Facilitator**: Manages the group by helping to ensure that the group stays on task, is focused, and that there is room for everyone in the conversation during the meeting, lead the consensus-building process (helps group members come to a common conclusion).
- **Task manager**: Keeps a record of those who were in the group, keeps meeting on time, and keeps track of interim and final deadlines. The recorder also records critical points from the small group's discussion along with findings or answers. Writes up key action items based on reflector; follows up to ensure work is being done on time.
- **Content quality manager(s):** review the content that report/course criteria are met, consolidate content, go to the teaching team for questions related to your work.
- **Contributor(s):** contributes to content, support to tasks, substitutes other role when necessary, and contributes to team-work dynamics.

B. Communication

    i. Communication Medium
- We use Whatsapp for informal updates and the planning of meetings.
- We use Teams for uploading files and content updates on the project.
- We make to dos in Teams to keep track of our progress.

    ii. Communication Timelines
- We can send each other updates whenever (all hours are okay, weekends are fine as well).
- Response is expected within a day during the week and working hours.

    iii. Communication Code of Conduct
- Informal communication within the team is good.
- If not urgent, chatting is preferred over calling.
- Let the group know in advance if you are not available to respond.

    iv. Document Sharing and Storage
- We use Teams to share documents.
- Let a team member know in advance if you want to make changes or use comments/track changes.

C. Team Meetings

    i. Scheduling
- We will schedule at least one meeting per week to discuss our progress. More if needed for a deadline.
- Our meetings will be between 9-18h during the week.

    ii. Involvement
- We aim for everyone to be present at a meeting (physically or online).
- If you can't be there:
  - Read the meeting notes.
  - Agree with meeting decisions (be there for decision-making)
- Up to the facilitator to say what needs to be prepared/done/read in advance.

    iii. Attendance & Notice
- Everyone aims to be on time and be at the meetings.
- Explain why you are late or cannot attend.
- We expect meetings to be
  - 1h for updates

○ 3h for working sessions.

D. Team Conflict & Decision Making

    i. Conflict Code of Conduct
- We vote if we disagree.
- We listen to the person with the most knowledge (familiar, previous experience, etc.)
- We mostly have discussions about whether something is important.

    ii. Initial Conflict & Conflict Escalation
- If we have conflict, we try to resolve it in a team meeting.
- If we have conflict, we cannot resolve ourselves, we discuss it with the TA.

    iii. Decision-Making
- We use team meetings for major decisions.
- If there are distinct tasks in the group assignment, we will split up into smaller groups. These groups can make their own decisions but discuss updates with the rest.

E. Stress Management

    i. Monitoring & Assistance
- Communicate if we cannot make deadlines.
- We don't rush each other; we will keep intermediate deadlines, so we don't need to do last minute things.

    ii. Resources
- We can do online meetings if it's more convenient.
- Lunch meetings to make it more fun with snacks.
- Each team member helps others.

F. Contract Code of Conduct

    i. Contract Breaches
- Have team meeting with feedback to understand each other.

3. Declaration

By signing below, team members acknowledge and agree to be bound by the guidelines outlined above.

_____   25/04/2024
Team Member Signature   Date

M. Miftahul Fahmi_____   _25 April 2024_____
Team Member Signature   Date

__   25/04/2024
Team Member Signature   Date

_____
Team Member Signature

28/04/2024
Date