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1 Introduction

In the process of locating areas with high flood risk, in the region of Attica, Greece [1], besides hydrological design and hydraulic modeling, additional research was made through three courses of action: (i) field research, (ii) public engagement through:

- direct communication with the public during in site research
- loose-format interviews regarding their experiences through indirect communication through online questionnaires and

(iii) the collaboration with municipalities, institutions and universities for collection of data and previous studies of the examined area.

These three actions are considered important, as they establish a more general approach in flood risk assessment, allowing engineers to combine knowledge and experience from several points of view, and thus, to result in a more efficient design of mitigation works.



Figure 1. (a) Greece in the world map; (b) The Attica studied area.

2 Methods

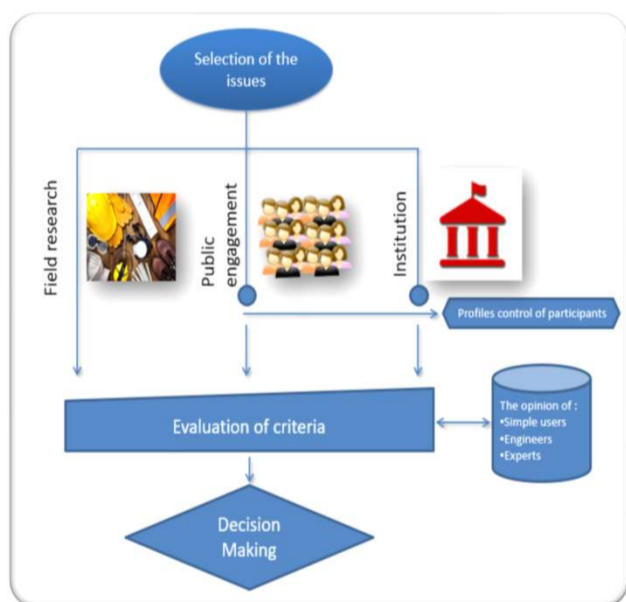


Figure 2: Actions applied for the integration of the assessment of public attitudes in flood-risk decision making

2i Field research

The research field of flood studies has had significant progress in past few years. Even though there is plenty of mapping and input data from satellite vision or drones, field-research is necessary for the flood studies as it detects a numbers of issues which are hidden by them. Unfortunately, this can only be done only by trained and specialized workers.

Having in mind that field-research must be connected with modern tools, this paper shows that engineers are the most appropriate for flood-study field-research.

2ii Public engagement

Direct (by interviews)



With the aim to identify areas prone to high flood-risk, a direct contact through brief interviews with the public in each area of examination was attempted during the in-site visits in the streams and rivers in the areas of interest. Particularly, people were asked their opinion on any past flooding incidents or upon specific locations prone to high-frequency flooding.

Indirect (by questionnaires)



For the purpose of additionally acquiring the residents' opinion, online questionnaires were conducted that contain multiple-choice questions.

2iii Collaboration with Institutions

During the analysis, the collection of all available data from Agencies and Institutions, such as Municipalities and Forestries, was given high priority. The cooperation between academic and research institutes and governmental authorities is crucial for the quantification of risks associated to natural hazards.

3 Results

The field research included:

- Codification of research points along the river and streams, depending on their type, e.g. bridge, pipe, cross section change, channel.
- Measurements of the exact dimensions, and material.
- Characterization of possible high-risk flooding
- Capturing photographs of each research point

The results of the questionnaires handed out to residents during field-work or online are presented in the following diagrams.

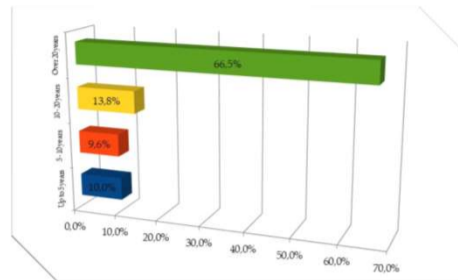


Figure 3. Question: How many years do you live in your area?

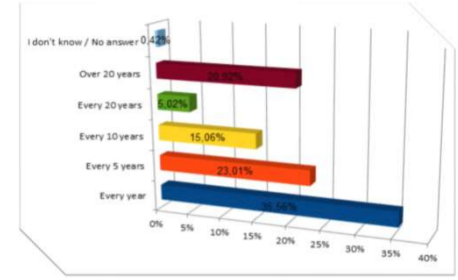


Figure 4. Question: How often would you characterize the flooding incidents in your area?

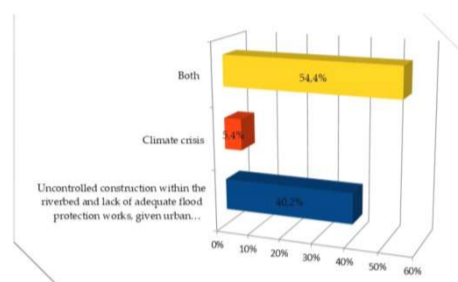


Figure 5. Question: What, in your opinion, is the main cause of the flooding incidents?

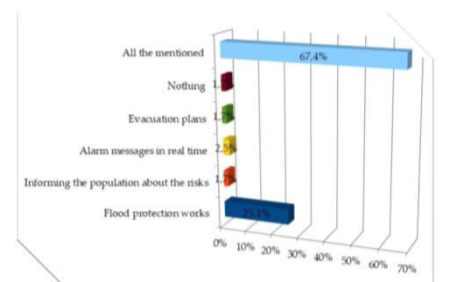


Figure 6. Question: Which measures would you prefer to be taken to decrease the flood risk?

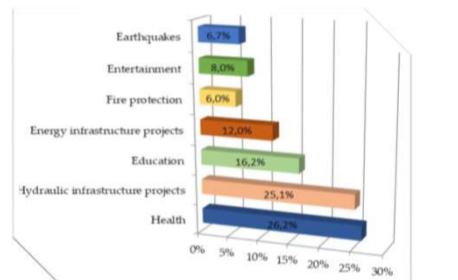


Figure 7. Question: Which are your most important needs - priorities for financing of infrastructure projects in your area?

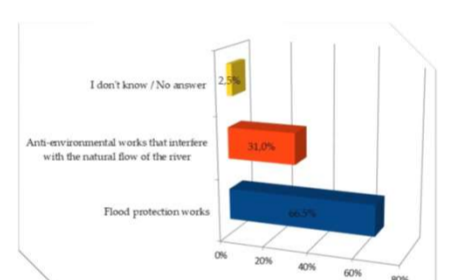


Figure 8. Question: Do you consider the river settlement works as:

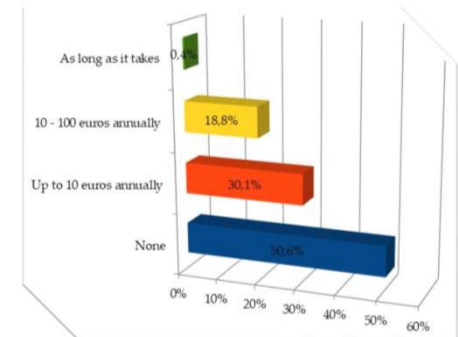


Figure 9. Question: If money was required for infrastructure projects, would you be willing to contribute and how much?

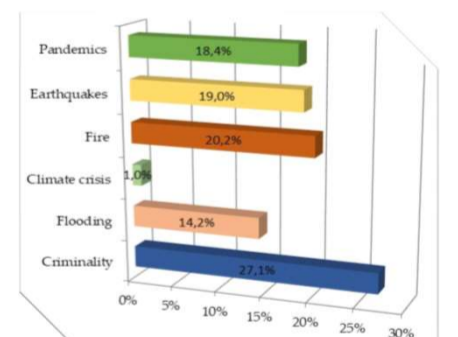


Figure 10. Question: For which sector would you like to be taken measures for your protection?

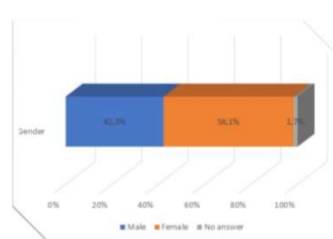


Figure 11. Question: Gender. Answers: (a) Male; (b) Female; (c) No answer.

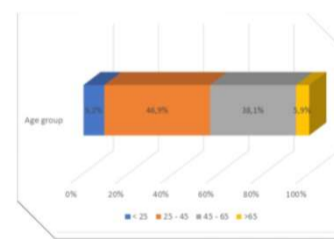


Figure 12. Question: Age groups. Answers: (a) < 25; (b) 25 - 45; (c) 45 - 65; (d) > 65.

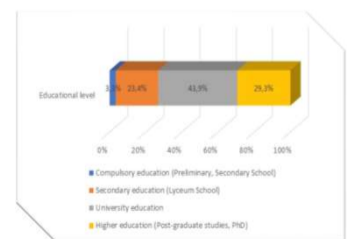


Figure 13. Question: Educational level.

4 Conclusions

The results of this study demonstrate that applying (a) field research, (b) public engagement and (c) institutions' collaboration in the process of defining high flood risk areas is highly effective and provides a rather holistic approach in flood risk assessment.

Field research in combination with the knowledge gained from communicating with residents with local experience helps in locating areas prone to flooding that, in many cases, would not manifest through digital flood-risk assessment tools. The communication with the public enriches the field research, while also investigating public attitudes on the integration of civil works within the urban area [2,3]. Additional flood-risk related information was obtained with the successful participation of governmental institutions.

It is argued that the residents should play an active role in the conception, design and implementation of flood protection works and social persuasion is a prerequisite [4]. In general, the acceptance of any civil works by the residents is a prerequisite for their successful implementation, without opposition and delays and with reduced impact to quality of life of local communities.

References

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