ELEONORA **PANIZZA**

AGENT-BASED MODEL (ABM) AS A TOOL FOR REDUCING FLOOD DISPLACEMENT RISK IN THE IGAD REGION

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The project aims at **developing a new methodology to understand the nexus between floods and human displacement in rural areas of the Intergovernmental Authority on Development (IGAD) Region**, in Eastern Africa. A strong understanding of the impact of floods on people and their behaviors is the basis for identifying and implementing risk reduction measures.

At this scope, an Agent-Based Model (ABM) is being developed, aiming at testing different policies and strategies on displacement patterns in the context of floods. The analysis of the scenarios developed in the ABM is going to be used for identifying the most effective measures in terms of reducing people's vulnerability and flood displacement risk. The results will support decision-makers in identifying the most urgent and appropriate measures to be implemented.

The research focus is on a rural pilot area, which is sited along the Nile River in Sudan, and not the whole IGAD Region. The idea is to apply the methodology to small sub-national areas, in order to address displacement drivers that characterize the region, avoiding one-size-fits-all solutions.

Data collection includes questionnaires to residents and semi-structured interviews to representatives of organizations and institutions responsible for the subject matter.

All the activities are conducted in partnership with IGAD and ICPAC (IGAD Climate Prediction and Applications Centre), following a capacity-development approach.

Mitigation is the predominant DRM phase in this project. The main goal is the identification of policies and strategies for reducing exposure and vulnerability in rural flood-prone areas, and for enhancing capacities to prepare and respond to these hazardous events. In the ABM, different kinds of policies and strategies will be tested. The identified measures should support decision-makers at the local, national, and regional level for the reduction of the effects of floods on people, thus reducing the number of people forced to flee their homes.

SECURITY AND PROTECTION THROUGH KNOWLEDGE SYNERGIES

BUSHRA SANIRA **ASIF**

BUILDING RESILIENCE AGAINST CLIMATE CHANGE THROUGH DIVERSIFICATION OF FOREST ECOSYSTEM SERVICES

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Wildfire in forest areas has become an imminent threat worldwide. Some of the reasons behind these increasing wildfire incidents are climate change, mismanagement and lack of diversification in the tree species. Previous research showed that the direct involvement of the stakeholders in the forest management process is crucial to reduce the damages from extreme wildfire events.

Majority of the forests in Europe are privately owned and any government intervention is not deemed favourable by the private owners. Forest owners' perception regarding prevention and diversification can serve as a starting point for designing forest that can withstand unfavourable environmental conditions like wildfires. It is possible to create resilient forests by convincing forest stakeholders to increase diversification in forest ecosystem services. **My PhD proposal will try to analyse the stakeholders' perceptions regarding forest ecosystem demands and supply, and how their involvement can be increased through different participatory approaches.** The proposal may also include designing an information seminar for forest stakeholders to inform them of future positive technological options regarding forest diversification so that they can be more aware and informed regarding the climatic effect on forests.

My research proposal suggests identifying main indicators behind wildfire events using previous literature and finding incentives to engage forest stakeholders to take actions to reduce the risk of wildfire events. The predominant phase within the disaster risk management cycle for my PhD proposal can be mitigation and prevention. **The main objective is to inform forest stakeholders and try to prevent and minimise the economic and social damages of extreme wildfire events which are more connected to the mitigation/preparedness phase of the disaster risk management cycle.** This project could also contribute towards the policy making of forest management when it comes to wildfire events which is part of the mitigation phase too.

SECURITY AND PROTECTION THROUGH KNOWLEDGE SYNERGIES

NICOLÒ **PERELLO**

FROM BURNING LEAF TO MEGAFIRES: CONNECTING PHYSICAL-BASED AND STOCHASTIC SIMULATION TECHNIQUES TO FACE EXTREME WILDFIRES EVENTS UNDER CLIMATE CHANGE SCENARIOS

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Climate Change is forcing the scientific community to prepare for scenarios increasingly characterized by uncertainty, with fires whose behavior could be unexpected or not yet analyzed. The occurrence of unforeseen extreme wildfire events in recent years is an example of this trend. In this framework, the knowledge based on past events may be insufficient and could be supported by simulation tools.

There are essentially two different strategies: physical-based and stochastic or empirical modelling. Physical-based models start from fundamental physical laws arriving then to simulate wildfire scenarios. This method, however, introduces numerous challenges. First, the approximations introduced during the equations settings, as well as those introduced in their numerical resolution, are balanced against the initial purpose of an accurate and comprehensive description of these events. Moreover these simulations usually need a detailed representation of the domain in which they are set and its condition at the beginning of the process. Both these aspects could not be easily known in case of real wildfire scenarios. Lastly, these simulations usually require a significant computational cost, leading to long simulation time. This aspect makes the use of this tool potentially unsuitable for operational purposes. On the contrary, stochastic or empirical models are suitable for that, because of their simplicity of setting and their fast simulation time. However, these models are based on either controlled experiments or past events behavior, and could therefore lose generality in extreme situations. Each method has its own strengths and weaknesses, which make it suitable for different purposes. **My PhD project will focus on connecting these two different strategies. The use of reduced-order modelling and machine learning techniques would allow results from simulations performed on smaller scales to be used for the simulation of large wildfires.**

My PhD activity can support the prevention, preparedness and response phases of the DRM cycle. In fact, the simulations of different wildfire scenarios can help identify the actions to mitigate wildfires effects, as well as planning the placement of resources in the preparedness phase. In addition, simulations of events occurring in real time can provide a useful tool for planning firefighting actions during the response phase.

SOHEIL **MOHAMMADI**

A RESILIENCE-BASED METHODOLOGY FOR THE MULTI-RISK ASSESSMENT OF URBAN SETTLEMENTS TO BE IMPLEMENTED IN SUSTAINABLE PLANNING AND MANAGEMENT TOOLS

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According to UNDRR terminology, resilience is the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate, adapt to, transform, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.

Damage to a city's basic physical structures caused by natural hazards creates a complex and challenging post-disaster environment. Many functions provided by the affected structures are disrupted and consequently, systemic processes, including recovery, are impaired and delayed.

In my Ph.D. research, I first seek to identify these essential structures and their interdependencies that ensure that the urban system is able to initiate and continue a timely and orderly recovery process, taking into account the socioeconomic needs and livelihoods of the disaster area population.

In addition, **the research aims to develop an applicable methodology as a tool for decision-makers to find the optimal investment alternatives to stabilize the system considering the limited budget**. This robustness should follow the improvement of overall resilience, with a focus on increasing the system's ability to recover under multi-risk conditions (especially flooding and earthquakes).

Although much research has been done on preparedness and pre-disaster planning to meet emergency limit conditions, little consideration has been given to community needs in pre-disaster planning for the start of and continuing the recovery phase. Therefore, it can be said that this research focuses on disaster risk preparedness with the perspective of the recovery phase of the disaster risk management cycle. The determination of the final strategies is based on the pre-disaster state of the system and its essential functions, as well as the provision of capacity and opportunities for effective and progressive recovery to build back better.

ROI **PANTÍN LÒPEZ**

INSPECCIONES DE SEGURIDAD EN SERVICIOS DE PREVENCIÓN, EXTINCIÓN DE INCENDIOS Y SALVAMENTO MEDIANTE UAS

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Use of unmanned aerial vehicles in the emergency sector and useful applications for the benefit of the safety of those involved.

In an emergency, the value of having an image at a given moment is crucial and even more so if it can be in the form of video, telemetry, 3d image, LiDAR, etc. In addition to these aspects, an emergency can also be managed by providing auditive, visual or even providing material in a point of difficult access. The aerial perspective of UAVs in emergencies, apart from giving us security, provides us with multiple options for the investigation of incidents or even in the integration of different means in an intervention.

DIEGO **RODRÍGUEZ SERANTES**

INSPECCIONES DE SEGURIDAD EN SERVICIOS DE PREVENCIÓN, EXTINCIÓN DE INCENDIOS Y SALVAMENTO MEDIANTE UAS

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In this master's thesis I will evaluate the internal and external risks of the Sala Ruido concert hall, by the taking of measurements, the making of observations, as well as interviews with its staff. Once the
evaluation is finished, a self-protection plan will be designed according to the risks detected, detailing the material equipment, human resources and procedures necessary to deal with the possible emergencies.

This master' thesis wants to put in practice the knowledge accumulated during the master through the design and elaboration of a thorough self-protection plan with tangible effects on the quality of the response to emergencies of a referent of local nightlife. It's intended as the empirical demonstration of the importance of establishing procedures adapted to the concrete reality of the business. That specificity and search for excellence, more than any theoretical input to the field of prevention, is the final objective of this thesis.

JUAN JOSÉ **LADA VILARIÑO**

PREVENTION OF PSYCHOLOGICAL RISKS OF THE UNEMPLOYED

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An analysis with which to investigate about the risks that job search, anxiety, stress, phobias and loss of confidence, generated by the hostile labour market, entail for the unemployed.

Technologies and applications bring us closer to a world of possibilities, and prevention is no stranger to this. Training in emergency management should be transversal to any type of training and such training should be renewed in a period not exceeding two or three years.

Early reaction is key in times of emergency, so up-to-date training and the right tools are crucial when it comes to saving lives and minimizing damage.

KRISTIÁN **FURIAK**

RISK MANAGEMENT DURING PROJECT IMPLEMENTATION IN THE ENTERPRISE – FOCUSED ON SPHERE OF RISK MANAGEMENT IN ENTERPRISE PROJECT MANAGEMENT | BUSINESS RISKS IN SELECTED ACTIVITY OF ENTERPRISE – FOCUSED ON SPHERE OF RISK MANAGEMENT IN ENTERPRISE ENVIRONMENT

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•To analyze internal and external determinations of company.
•To determine and assesst risks.
•To propose a complex project for reduction of risks.
•To assesst project risks and propose measures for their reduction.
•Will be finalized in 2022.

Civil protection projects

Integrated civil protection information system
• Propose of IS for sharing information and public education.
• The main idea – create an integrated system for education, information sharing and warning in case of threat.
• The article about this IS was publicated in journal of Deparment of Interior of Slovak Republic.
• Basic element – Analysis of threats in municipality. (Source of informations about local threts. Part of public available informations. Contain also informations about prevention on municipal level)

Crisis management documents for Belá municipality
Project focused on improvement of public safety level and preparation on extraordinary events.
Stage 1 – rewiev of existing documents and plans | Stage 2 – correction and elaboration of new documents and plans|Stage 3 – publishing of informations and introduction of EPSIS information system.
*Analysis of threats in Belá municipality (*Creation of whole new Analysis. Source of informations for publicand state elements. A very important part – risk assessment.)

Risk assessment

•One of the most important part of all my university works.
•Necessary in business crisis management and also in public crisis management.
•Well-designed risk assessment – great soruce of valuable informations.
Requirements on risk assessment in municipality environment based on my experiences
•Public environement – main problem is that significant part of people do not have any experiences.
(Problems to understanding the system. Incorrect use of the system. Incorrect iterpretation of informations.)
•Use simple methods for risk assessment.
•Make sure that the output is clear and simple.
•Try to avoid information overload.
•Make sure that responsible person uderstand the system.

SECURITY AND PROTECTION THROUGH KNOWLEDGE SYNERGIES

DANIEN **CHOVANEC**

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Current bachelor thesisentitled "Fire protection in hazardous waste treatment " analyzes the handling of hazardous waste in specific organization that deals with waste management.

The thesis describes the current measures at the level of fire protection and their effectiveness in real conditions, the risks that arise in the treatment of hazardous waste and methods of disposal and storage of waste.

The project takes into account the impact of individual hazardous substances and their characteristics and the resulting necessary measures to prevent fire, fire extinguishing, protection of employees and intervening units, as well as ways to prevent natural disasters in case of leakage into the environment. The conclusion is to synthesize current knowledge in the field of waste management, determine risks, evaluate current measures and propose the use of new or additional measures based on findings, analyzes and fire statistics.

The predominant phase is prevention as important measures in the field of fire protection were the main idea of the thesis that assesses these measures and proposes new ones in an effort to prevent the emergence of potentially dangerous situations that could arise in the process of hazardous waste management.

SECURITY AND PROTECTION THROUGH KNOWLEDGE SYNERGIES

SERGIO **ANTIME MUÑIZ**

SELF-PROTECTION PLAN OF THE SCHOOL OF ARCHITECTURE OF A CORUÑA UNIVERSITY

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Development of a Self-Protection Plan to determine an assessment of the risks, what measures are necessary for the prevention and control of these risks, as well as the protective measures or other actions that are to be taken in the event of an emergency in a university centre.

MARTHA LUCIA **LOPEZ MONTES**

TECHNICAL STUDY OF THE EFFECTS OF ELECTROMAGNETIC RADIATION ON HEALTH

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The job pursues to evaluate the long, medium and short term effects on health of exposure to electromagnetic radiation, and the changes caused by different levels of radiation exposure..

The work intends to determine the risks of exposure to electromagnetic radiation in health from the study of the vulnerability of the worker against the different levels of exposure, and its consequences in the long, medium and short term, in order to establish the strategy of organization and management of resources to respond to an emergency. In addition, the job also covers the distribution of responsibilities, the preparation, the response, and the steps that are to be followed when facing the emergency situation triggered by exposure to this type of radiation.

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