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**Institute of Ecology and Earth Sciences**  
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LOOM.02.124  
Project Management

**Project proposal for Horizon2020 program**

***ESCAPE***  
***European Smart Community Action Plan***  
***for Prevention and Evacuation***

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Tartu  
2018

## **Horizon 2020**

**Topic:** Copernicus evolution – Research activities in support of cross-cutting applications between Copernicus services

**Type of action:** RIA Research and Innovation action

**Proposal number:** XXXX

**Proposal acronym:** ESCAPE

*Proposal ID*

*XXXX*

*Acronym*

ESCAPE

## 1 - General information

Topic Copernicus evolution – Research activities in support of cross-cutting applications between Copernicus services

Call Identifier LC-SPACE-04-EO-2019-2020

Type of Action RIA Research and Innovation action

Deadline Id

Acronym

ESCAPE

Proposal title

European Smart Community Action Plan for Prevention and Evacuation

Duration in months

24

Free keywords

Climate change mitigation, satellite data, drones

## Abstract

The goal of the project is to reduce damages from flooding and related natural disasters by elaborating a complex forecasting and warning system that would combine the analysis of satellite data and participatory early warning platforms, as well as innovative approaches to evacuation and rescue. The project combines in a unique way the use of satellite data, smart technologies, know-how of the project partners, and the environmental awareness raising.

The project aims to:

- assess the flood vulnerability and examine resilient flood management practices,
- raise environmental awareness and educate both the society and governmental and non-governmental institutions,
- improve the implementation of the risk management plans and introduce environmental practices,
- introduce early warning systems with participatory approach,

The project consists of three work packages (WP). The WP1 deals with the examination of the existing situation in flood management and produces suggestions for improvements. The WP2 introduces innovative mitigation practices and response measures. It deals with the development of early warning system, based on satellite data and public involvement, and with the use of drones for emergency situations. The WP3 raises awareness and improves the coordination and reaction of authorities.

The project contributes to the Focus Area 'Building a low-carbon, climate resilient future', Societal Challenge 5 'Climate action, environment, resource efficiency and raw materials'. The implementation of the project will help to enhance the resilience to climate changes in the project countries, but the research results and the implemented solutions can be transferred elsewhere as well to handle the consequences of climate change. The project aims to improve the mitigation and adaptation policy planning in long-term. Thus the project will create tailored solutions in various levels, including regional and local level.

*Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under Horizon 2020 or any other EU programme(s)?*

**No**

### List of participants

#	Participant Legal Name	Country
1.	The University of Zagreb (UZ)	Croatia
2.	National Protection and Rescue Directorate (NPRD)	Croatia
3.	SUNCE Associationa for Nature, Environment and Sustainable Development (SUNCE)	Croatia
4.	Municipality of Slavonski Brod (MSB)	Croatia
5.	Municipality of Sisak (MS)	Croatia
6.	Slovenian Environment Agency (SEA)	Slovenia
7.	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR)	Slovenia
8.	The University of Ljubljana (UL)	Slovenia
9.	Umanotera, The Slovenian Foundation for Sustainable Development (SFSD)	Slovenia
10.	Municipality of Kranj (MK)	Slovenia
11.	Municipality of Ljubljana (ML)	Slovenia
12.	Ministry of Environment and Tourism (MET)	Bosnia and Herzegovina
13.	World Wide Fund For Nature Adria (WWFA)	Bosnia and Herzegovina
14.	Local government of Brčko District (BD)	Bosnia and Herzegovina

### 3 - Budget for the proposal

YEAR 2019													
No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of subcontracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F+G)	(I) Reimbursement rate (%)	(J) Max.EU Contribution / € (=H*I)	(K) Requested EU Contribution/ €
1	UZ	Croatia	91500	31900	20000	20000	20000	27850	20000	59250	20001	59250	59250
2	NPRD	Croatia	54250	14850	0	0	0	17275	0	86375	1	86375	86375
3	SUNCE	Croatia	27000	1900	0	0	0	7225	0	36125	1	36125	36125
4	MSB	Croatia	2000	0	0	0	0	500	0	2500	1	2500	2500
5	MS	Croatia	2000	0	0	0	0	500	0	2500	1	2500	2500
6	SEA	Slovenia	108000	21200	0	0	0	32300	0	161500	1	161500	161500
7	ACPDR	Slovenia	32500	2400	0	0	0	8725	0	43625	1	43625	43625
8	UL	Slovenia	138000	26000	0	0	0	41000	0	97500	1	97500	205000
9	SFSD	Slovenia	2000	400	0	0	0	600	0	3000	1	3000	3000
10	MK	Slovenia	2000	1000	0	0	0	750	0	3750	1	3750	3750
11	ML	Slovenia	2000	1000	0	0	0	750	0	3750	1	3750	3750
12	MET	Bosnia and Herzegovina	52500	4200	0	0	0	14175	0	70875	1	70875	70875
13	WWFA	Bosnia and Herzegovina	1200	800	0	0	0	500	0	2500	1	2500	2500
14	BD	Bosnia and Herzegovina	2000	1000	0	0	0	750	0	3750	1	3750	3750
<b>TOTAL</b>			516950	106650	20000	20000	20000	152900	20000	577000	20014	577000	684500

YEAR 2020													
No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of subcontracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F+G)	(I) Reimbursement rate (%)	(J) Max.EU Contribution / € (=H*I)	(K) Requested EU Contribution/ €
1	UZ	Croatia	138500	18500	0	0	0	39250	0	20000	1	20000	20000
2	NPRD	Croatia	60000	41250	0	0	0	25312.5	0	126562.5	1	126562.5	126562.5
3	SUNCE	Croatia	1500	0	0	0	0	375	0	1875	1	1875	1875
4	MSB	Croatia	500	0	0	0	0	125	0	625	1	625	625
5	MS	Croatia	500	0	0	0	0	125	0	625	1	625	625
6	SEA	Slovenia	0	0	0	0	0	0	0	0	1	0	0
7	ACPDR	Slovenia	11500	5000	0	0	0	4125	0	20625	1	20625	20625
8	UL	Slovenia	63000	100000	0	0	0	40750	0	0	1	0	203750
9	SFSD	Slovenia	500	0	0	0	0	125	0	625	1	625	625
10	MK	Slovenia	500	500	0	0	0	250	0	1250	1	1250	1250
11	ML	Slovenia	500	500	0	0	0	250	0	1250	1	1250	1250
12	MET	Bosnia and Herzegovina	26500	1000	0	0	0	6875	0	34375	1	34375	34375
13	WWFA	Bosnia and Herzegovina	10500	5500	0	0	0	4000	0	20000	1	20000	20000
14	BD	Bosnia and Herzegovina	500	500	0	0	0	250	0	1250	1	1250	1250
<b>TOTAL</b>			314500	172750	0	0	0	96500	0	102500	14	102500	306250

<b>Grand total</b>	831450	279400	20000	20000	20000	249400	20000	679500	20028	679500	990750
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## 4 - Ethics issues table

<b>1. HUMAN EMBRYOS/FOETUSES</b>	
Does your research involve <a href="#">Human Embryonic Stem Cells (hESCs)</a> ?	<b>No</b>
Does your research involve the use of human embryos?	<b>No</b>
Does your research involve the use of human foetal tissues / cells?	<b>No</b>
<b>2. HUMANS</b>	
Does your research involve human participants?	<b>Yes</b>
Does your research involve physical interventions on the study participants?	<b>No</b>
<b>3. HUMAN CELLS / TISSUES</b>	
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	<b>No</b>
<b>4. PERSONAL DATA</b>	
Does your research involve personal data collection and/or processing?	<b>No</b>
Does your research involve further processing of previously collected personal data (secondary use)?	<b>No</b>
<b>5. ANIMALS</b>	
Does your research involve animals?	<b>No</b>
<b>6. THIRD COUNTRIES</b>	
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	<b>No</b>
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	<b>No</b>
Do you plan to import any material - including personal data - from non-EU countries into the EU?	<b>No</b>
Do you plan to export any material - including personal data - from the EU to non-EU	<b>No</b>
If your research involves low and/or lower middle income countries, are benefits-sharing measures foreseen?	<b>Yes</b>
Could the situation in the country put the individuals taking part in the research at risk?	<b>No</b>
<b>7. ENVIRONMENT &amp; HEALTH and SAFETY</b>	
Does your research involve the use of elements that may cause harm to the environment, to animals or plants? <i>For research involving animal experiments, please fill in also section 5.</i>	<b>No</b>



Does your research deal with endangered fauna and/or flora and/or protected areas?	<b>Yes</b>
Does your research involve the use of elements that may cause harm to humans, including research staff? <i>For research involving human participants, please fill in also section 2.</i>	<b>No</b>
<b>8. DUAL USE</b>	
Does your research involve dual-use items in the sense of Regulations 428/2009, or other items for which an authorisation is required?	<b>No</b>
<b>9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS</b>	
Could your research raise concerns regarding the exclusive focus on civil applications?	<b>No</b>
<b>10. MISUSE</b>	
Does your research have the potential for misuse of research results?	<b>No</b>
<b>11. OTHER ETHICS ISSUES</b>	
Are there any other ethics issues that should be taken into consideration? Please specify	<b>No</b>
I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents.	<b>Yes</b>

# Project proposal: Technical annex

## European Smart Community Action Plan for Prevention and Evacuation – ESCAPE

### List of participants

Participant No *	Participant organisation name	Country
1. (Coordinator)	The University of Zagreb (UZ)	Croatia
2.	National Protection and Rescue Directorate (NPRD)	Croatia
3.	SUNCE Associationa for Nature, Environment and Sustainable Development (SUNCE)	Croatia
4.	Municipality of Slavonski Brod (MSB)	Croatia
5.	Municipality of Sisak (MS)	Croatia
6.	Slovenian Environment Agency (SEA)	Slovenia
7.	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR)	Slovenia
8.	The University of Ljubljana (UL)	Slovenia
9.	Umanotera, The Slovenian Foundation for Sustainable Development (SFSD)	Slovenia
10.	Municipality of Kranj (MK)	Slovenia
11.	Municipality of Ljubljana (ML)	Slovenia
12.	Ministry of Environment and Tourism (MET)	Bosnia and Herzegovina
13.	World Wide Fund For Nature Adria (WWFA)	Bosnia and Herzegovina
14.	Local government of Brčko District (BD)	Bosnia and Herzegovina

## **1. Excellence**

The project aims to reduce damages from flooding and related natural disasters by elaborating a complex forecasting and warning system that would combine the analysis of satellite data and participatory early warning platforms, as well as innovative approaches to evacuation and rescue. The project combines in a unique way the use of smart technologies, know-how of local academia and non-governmental sector, and the environmental awareness raising in the society.

### **1.1 Objectives**

The project aims to accomplish such objectives:

- To examine the causes and concomitant circumstances of the most destructive natural disasters the countries have experienced and to examine resilient practices in flood management, furthermore potentially introduce them in the countries of the project;
- To raise environmental awareness that helps to reduce damages, heighten resilience, and educate how to react to disasters;
- To improve the implementation of the risk management plans and to introduce early warning systems with participatory approach (platforms and mobile applications where citizens may report the situation and need for help);
- To introduce environmental practices that help to prevent flooding and minimize the casualties.

### **1.2 Relation to the work programme**

The project contributes to the Horizon 2020 Work Programme 2018 – 2020 Focus Area 'Building a low-carbon, climate resilient future', Societal Challenge 5 'Climate action, environment, resource efficiency and raw materials' (SC5).

The implementation of the project will help to enhance the resilience to climate changes in the project countries, but the research results and the implemented solutions can be transferred elsewhere as well to handle the consequences of climate change.

The project includes short-term response measures to tackle emergencies, but also aims to include long-term actions to improve the mitigation and adaptation policy planning. Thus the project aims to create tailored solutions in various levels, including regional and local level. Considering that flooding is a cross-border issue, the project will include transnational cooperation between governmental institutions and non-governmental bodies.

### **1.3 Concept and approach**

The project intends to support vulnerable communities in the European Union states of Croatia and Slovenia and the European Union accession state of Bosnia and Herzegovina. By bringing together expertise and proven solutions, the project will bring significant improvements to the safety and security of these communities with cost-effective and sustainable results.

The project partners include governmental institutions and agencies, academia and scientific bodies, NGOs, local governments, and industry. During all the project stages, the society will be involved to bring inside knowledge about the state of art and to elaborate tailor-made solutions.

The project idea is based on the axiom that in order to bring sustainable and long-lasting changes, it is crucial not only to implement technological solutions, but also to change the behaviour patterns of the local society. Therefore most of the project activities will involve trans-disciplinary approach of technological innovations in hand in hand with the environmental awareness raising in the society, and the project solutions will take into account the expertise of the local stakeholders.

The project actions are concentrated on prevention, mitigation, and adaptation:

- 1) Methods of prevention will focus on best practices and areas of risk;

- 2) Methods of mitigation will focus on minimizing damage of the disasters and secondary events coming from them;
- 3) Methods of adaptation will focus on what to do in situations which damage cannot be fixed, seeing where damage is done during simulation, and how to improve results next time.

The work will be organised in three main work packages focusing on Flood vulnerability assessment to resilience strategy, Innovative practices to combat floods, and Awareness, Training, and Coordination.

### **Work Package One (WP1):**

Flood vulnerability assessment to resilience strategy: The work package will focus on traditional means of mitigation and prevention, example of this is creation of maps of areas, infrastructure, and settlements at risk. The various subtask are as follow:

- **Preparation of the flood vulnerability assessment about the areas and infrastructure at risk**
  - Focuses on assessment on which are at high risk for damage in the event of flooding, and damage done to local economies, and eventually.
- **Preparation of the report on the bottlenecks in the implementation of risk management plans**
  - An organizational and logistical analysis is needed as to prevent delays of people receiving and acting upon information, as time loss could me people dying or lose of important infrastructure.
- **Analysis of best resilience practices in flood prevention, mitigation, and recovery**
  - A fundamental bedrock of emergency management being practices of flood prevention, mitigation, and recovery, this part of WP1 will focus on finding best practices for the geography and political situation of the region, producing a report that will outline the best practices for this situation.

### **Work Package Two (WP2):**

Innovation in Mitigation and Rescue: Being part of the RIA program, a certain source of innovation is required. In this case, the source of innovation is a formal analysis of what drones can do, creation of classes and niches that they fulfill best, and coming up with a prototype fleet of drones to create a demonstration of integration into the Sentinel-4 Copernicus Emergency Management (CEM) system, which can be a line of future research. The various subtask are as follow:

- **Investigative use of drones for emergency situations.**
  - Focuses on the research and development of drones within framework of current of emergency management, seeing which drones on the market could fulfill these requirements
- **Development of Mobile Application for Emergency Warning System**
  - This part will focus on creating a mobile application, that is system agnostic, and works with CEM system and data frame, which will give emergency warnings based off of location. The use of legal advice from UZ will help make suggestions as to what is possible and what is ethical in developing laws required to implement the system without stepping on privacy.
- **Integration of Data, Application, and Drones into CEM System**
  - Using the data from flood vulnerability assessment, the prototype of the drone fleet selected, and the mobile application within CEM system, a new emergent emergency response and recovery system will be created and shown, using volunteer data for locational examples.

### **Work Package Three (WP3):**

Awareness, Training, and Coordination: By increasing awareness, training among civilians for emergency situations, and increase coordination between officials and services. The various subtasks are as follow:

- **Raising awareness of society, coordinating authorities, and involving society in flood management**
  - The focus on societal coordination to reaction of flooding and other emergency events is needed as the communication and coordination between people is the backbone to getting responses to dangerous situations.
- **Improving the coordination and reaction of authorities**
  - This section is further improving on the reaction of governmental offices and authorities in reference towards the WP1 results.
- **Prevention methods to protect cultural heritage and livelihoods**
  - Meeting with local communities and areas to help find which need protection such as monuments or farms steads. From there we can add this data into Emergent-CEM system as areas to pay attention to during heavy rain and flooding events.

The overall approach and methodology will focus on holistic societal contributions and involvement, alongside scientific research and implementation of drone systems to further increase and innovate upon existing frameworks of emergency management.

The project will include climate change research in all three project countries, concentrating on how precipitation and the occurrence and intensity of flooding events have changed over time and their relation to deforestation and local economic development, as well as developing an early warning system and using drones in rescue and supply efforts. One of the project results will be the elaboration of flood forecast and early warning system. After the finishing of the project the system will be ready to use in the area of the project.

The project will follow non-discrimination standards and both the project team and the project partners will employ both men and women on equal requirements.

#### **1.4 Ambition**

The projects aims to enhance the use of Sentinel earth observation data regarding the climate research and emergency management. This data will be used not only for the research about the climate changes that have occurred, but also for prediction of the potential flooding events and seeing what areas are at risk. Even more, a new early warning system will be created, based on satellite data and supplemented by local observation data and society contribution.

The early warning system will be designed for the project region, but it can be transferred and adjusted to other places and natural disasters, for instance, forest fires. Because how it is tied to Copernicus and Sentinel-4, it could be theoretical used all over the world.

## 2. Impact

### 2.1 Expected Impacts

In terms of Copernicus Evolution specific impacts, this project could be amplified by combining drone technology on localized region, to help create a stronger emergency management and effort in prevention, mitigation, and adaptation. In the case of emerging markets, the use of drones specialized in CEM data could be offered to developing countries to help increase the influence and standing of the EU, and by having scientific and academic communities working together on this data working together it will help create stronger links between the two sectors and fields.

And on the industrial level, it will help create a niche without the Balkans for emergency management specialized drones which can be marketed towards outside countries, and create a sector for it.

In detail, the project will focus on contributing to research and innovation in emergency management by decreasing response time and increasing response range in areas that are disconnected from urbanized areas, such as mountainous or not as well developed region or situations in which the main means of transportation and connection have broken down.

It shall work by using CEM data to help develop rapid dissemination of information on where people should go to stay safe and using mobile data to help to find people who are in immediate danger tell them where safety is. This will be done by working in close cooperation with telecommunication providers and setting up clear guidelines and course of action to take during major disaster events. The second part of our plan is using drones as minute-to-minute monitoring of certain points of interest during a disaster such as an area with a high possibility of land sliding. And in certain cases of dire consequence, having drones send supplies to people in areas rescue workers can't reach at the moment, and too risky to send helicopter crews to send help.

This program will help create expertise in web-development, mobile data usage, and use in Sentinel-4 data which can help create spin-off companies, and help support a tertiary level sector. However that being said there are barriers and obstacles to this project. Among these is the possible lack of infrastructure of mobile carriers in the region, the current regulation among the Balkan countries that are part of our program for mobile data use and access, and whether or not our project can be fully used or not. Another problem is whether these countries can maintain their independent fleet of drones after the project is complete. If the countries cannot maintain their fleets, the main innovations of this project partially fails.

The impacts will be very niche in the current laws and society, mostly in the form of mobile privacy and data rights. However the main side effect of this research would be that drones can help spur the adoption of drone technology in situations of extreme flooding and landslides to get to certain areas without putting human lives at risk.

The use of drones in emergency situations is a relatively unexplored niche, therefore the possibility of innovative strategies are there. However information is useless if it is not shared, so a plan for dissemination and exploitation of the project is needed.

The main potential users of our end product are government entities from the local to the national level in the area, and countries who want to emulate our work. Because of Sentinel-4 status as a main component of the system, the use of the system can be widened to other countries across the world.

Potential research into this aspect is how effective drones can be in monitoring of environmental conditions on the minute to minute basis, sending aid, and creating policies on how to implement drone work into modern emergency management.

Main innovations of the research will be integrating local spatial data into a larger system which includes CEM data. This requires developing a system that is OS and carrier agnostic. Not only that but giving minute to minute updates on situations is not only a technical program but organizational

one, because if the organization cannot act on the updating situations fast enough, the relevance of update is null.

The proposed measures in our research will help bring in practices to help prevent, mitigate, and react to emergency situation such as flooding. By educating people how to properly prepare against heavy rains, using drones for monitoring situations and sending supplies to cut off areas, and then seeing what damage can be fixed, and if not, coming up with a plan to relocate resources and people to safer areas.

The types of data generated and located will geomorphological, Sentinel-4 CEM data, and possibly mobile. The geomorphological will come from local partner universities, the Sentinel-4 CEM data from Copernicus, from mobile data from providers via an ethical system made from suggestions by the University of Zagreb.

WP3 seeks to create a positive impact by improving and protecting the environment of the Sava river basin. It seeks to increase community and stakeholder interest, awareness and cooperation. Milestones 16 and 17 aim to create a positive lasting environmental impact. The project seeks to create a positive impact by strengthening communities and local economies, including by working to protect agricultural land and livelihoods and protect cultural artefacts.

## **2.2 Measures in Maximize Impact**

### **a.) Dissemination and exploitation of results**

Much of the data cannot be shared openly as it tied of the Sentinel-4 security issues, and the issues of privacy of mobile. However the Universities could act as advisors for other countries and governments who want to implement a similar system, allowing the use of research while maintaining security and privacy by the people.

The main form of curation of research and knowledge would be preserved by the universities we partner with and them disseminating the data when they recoup most of their cost.

The main strategy for knowledge management and protection will be that most of the data will be stored on a secure server with limited access from the scientist working on the project, with dissemination of data coming from a “green” open access, with findings released after the project embargo period, to which the universities can recoup their cost from the data analysis. However gold access can be negotiated as the most of the funding will come from the EU.

### **b.) Communication Activities**

The main way of communication of findings to the public will be through our website, social media, and media campaigns in WP3, with relevant articles and news networks to talk about possible application of our research. Within the scientific community, scholarly articles and peer-to-peer communication will advertise our work within the scientific community.

### 3. Implementation

#### 3.1 Work plan — Work packages, deliverables and milestones

The project consists of three work packages (WP):

- From flood vulnerability assessment to resilience strategy,
- Innovative practices to combat floods,
- Raising awareness of society and involving society in flood management.

The WP1 deals with the examination of the existing situation in flood management and produces suggestions for improvements in risk management and about best resilience practices.

The WP2 concentrates on introduction of innovative practices into mitigation and response measures. It deals with the development of early warning system, based on satellite data and public involvement, and with the use of drones for emergency situations.

The WP3 seeks raise awareness of society, coordinating authorities, and involving society in flood management. It also will improve the coordination and reaction of authorities and carry out tasks to protect cultural heritage and livelihoods.

The synergy of all three WPs will ensure the accomplishment of the project objectives and will ensure the best possible long-term results, as the activities will change the behavioral patterns and raise awareness of the stakeholders.

Each WP consists of three tasks, and each task consists of subtasks. The structure of the project is presented in the Gantt chart (appendix 1).

The tasks are interrelated, therefore it is necessary to acknowledge their connection. That is presented in Pert chart (appendix 2).

**Table 3.1a: List of work packages**

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End month
1.	From flood vulnerability assessment to resilience strategy	1	UZ	67	02.01.2019.	30.06.2020.
2.	Innovative practices to combat floods	8	UL	120	02.01.2019	31.12.2020
3.	Raising awareness of society and involving society in flood management	6	SEA	116.8	01.03.2019	31.12.2020
				<b>Total person-months</b>		



**Table 3.1b: Work package description**

Work package number	1		Lead beneficiary				The University of Zagreb (UZ)							
Work package title	From flood vulnerability assessment to resilience strategy													
Participant number	1	8	6	2	3	12	7	4	5	9	10	13	11	14
Short name of participant	UZ	UL	SEA	NPRD	SUNCE	MET	ACPDR	MSB	MS	SFSD	MK	WWFA	ML	BD
Person/months per participant:	12	3	3	14	11	11	13	1	1	1	1	1	1	1
Start month	Month 1 (January 2019)					End month			Month 18 (June 2020)					

**Objectives**

To assess flood vulnerability and risk management and to suggest the best resilience practices for project countries.

**Description of work, lead partner and role of participants**

The lead partner for the work package: the University of Zagreb

**Tasks:**

1. Preparation of the flood vulnerability assessment about the areas and infrastructure at risk, considering population, and economic activities (the lead partner: the University of Zagreb)
  - The Slovenian Environment Agency and the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief prepare initial reports on endangered settlements, infrastructure and other areas and objects.
  - Ministry of Environment and Tourism (Bosnia and Herzegovina) and SUNCE Association for Nature, Environment and Sustainable Development (Croatia) analyse the influence of flooding on the local economies and identifies other risks caused by flooding events.
  - All the municipalities, as well as SFSD contribute to the development of the initial reports with their expertise and long-term observations, as well as with the public opinion.
  - The University of Zagreb prepares the draft report, based on the initial reports of project partners, SENTINEL and national data (provided by project partners), about the changes in precipitation and the occurrence and intensity of flooding events and their relation to deforestation. After public hearing the University prepares final report.
2. Preparation of the report on the bottlenecks in the implementation of risk management plans (the lead partner: the University of Ljubljana)

- National Protection and Rescue Directorate (Croatia) analyses the existing risk management plans and prepares the draft report. After the public hearing it produces the final report on the bottlenecks in risk management plans and necessary improvements.
  - The University of Ljubljana organises the public hearing with all project partners to discuss and complement the report, and contributes to the final version of the report.
  - All the municipalities, as well as SFSD contribute to the public hearing with their expertise and long-term observations, as well as with the public opinion.
3. Analysis of best resilience practices in flood prevention, mitigation, and recovery (the lead partner: the University of Zagreb)
- SUNCE Associationa for Nature, Environment and Sustainable Development (Slovenia), Ministry of Environment and Tourism (Bosnia and Herzegovina), and Administration of the Republic of Slovenia for Civil Protection and Disaster Relief analyse the best resilience practices in flood prevention, mitigation, and recovery and produce a draft report.
  - All the municipalities, as well as SFSD contribute with their expertise and long-term observations, as well as with the public opinion.
  - The University of Zagreb combines the best resilience practices to produce a draft report, including suggestions for the project countries. It organises a public hearing and produces the final project.

#### **Deliverables (brief description and month of delivery)**

Flood vulnerability assessment on the areas and infrastructure at risk, considering population, and economic activities – 31.12.2019. (12 months)

Report on the bottlenecks in the implementation of risk management plans and necessary improvements – 30.09.2019. (9 months)

Analysis of best resilience practices in flood prevention, mitigation, and recovery – 30.06.2020. (18 months)

<b>Work package number</b>	2	<b>Lead beneficiary</b>	The University of Zagreb (UZ)
<b>Work package title</b>	Use of drones in emergency response and monitoring		
<b>Participant number</b>	1	8	
<b>Short name of participant</b>	UZ	UL	
<b>Person/months per participant:</b>	72	48	
<b>Start month</b>	Month 1 (January 2019)	<b>End month</b>	Month 24 (December 2020)

### Objectives

To explore the use of aerial drones to use of monitoring areas of interest in emergency situations and send in supplies in cutoff areas until more help can arrive.

### Description of work, lead partner and role of participants

The lead partner for the work package: the University of Ljubljana

#### Tasks:

- UL will explore possible use of drones in emergency situations, and see which kinds of commercial drones are most cost-effective in an emergency situation.
  - Develop role requirements for drones
  - Research potential drones to fulfil roles
  - Test drones in a variety of possible situations and results
  - Selection of drones for first fleet
- Early and rapid warning system (the lead partner: the University of Zagreb)
  - CEM data frame and how it works
  - Legal expertise and privacy advisors
  - Development of application
  - Testing application alone
- Integration of both projects into the Sentinel-4 CEM system (the lead partner: the University of Zagreb)
  - Software integration between various systems together.
  - Test the basic system
  - Improve the system and localize software for use by partner countries

### Deliverables (brief description and month of delivery)

Report on what niches that drones can fill during emergency situation, and which drones are most suitable on the market at the time of research– 31.04.2020. (16 months)

Coming up a suggestion of legal framework on how to appropriately use Sentinel-4 CEM data and use telecommunication to disseminate warnings and find people in emergency situations – 30.09.2020. (16 months)

Demonstration of system working together and publishing research on it. – 01.12.2020. (23 months)

Work package number	3	Lead beneficiary		University of Zagreb			
Work package title	Raising awareness of society and involving society in flood management.						
Participant number	1	8	6	2	3	12	7
Short name of participant	UZ	UL	SEA	NPRD	WWFA	MET	ACPDR
Person/months per participant:	0.8	20	40	28	4	20	4
Start month	Month 3 (March 2019)			End month	Month 24 (December 2020)		

### Objectives

Increase community awareness in flood and pollutant risk. Coordinate evacuation plan

### Description of work (where appropriate, broken down into tasks), lead partner and role of participants

The lead partner for the work package: Croatian Environment Agency

#### Tasks:

##### 1. Improving community awareness

- Plan to gather and distribute information to the media and to raise awareness within civic and religious institutions (the lead partner: the Bosnian Ministry of Environment and Tourism (MET))
  - Develop and maintain a website for the community to view floodplain mapping and encourage people to be more self-resilient by understanding their risk of flooding
  - Protect livelihoods and valuable cultural heritage
- ##### 2. Improving the coordination and reaction of authorities (the lead partner: National Protection and Rescue Directorate (NPRD))
- Devise and simulate an evacuation effort. Following this, analyse the effort, improve and repeat
  - Coordination with monitoring teams to ensure citizens leave evacuation zones and do not return to zones which are potentially affected by landmines
- ##### 3. Prevention methods to protect cultural heritage and livelihoods (the lead partner: the University of Zagreb)
- Coordinated moving and storing of cultural artefacts
  - Coordinate with local farmers to prevent agriculture from flooding and the pollutants leaking into floodwaters.

- Raise awareness and support campaigns for afforestation, to prevent further damming and alterations of river courses

Assessment on how to raise community awareness to prevent, mitigate and escape from flooding event – 01.01.2020. (12 months)

Assessment and report on how best to coordinate a response with authorities and trained volunteers – 01.09.2019. (12 months)

Methodology and report how to protect cultural heritage and livelihoods – 01.07.2020. (12 months)

**Table 3.1c: List of Deliverables**

<b>Deliverable (number)</b>	<b>Deliverable name</b>	<b>Work package number</b>	<b>Short name of lead participant</b>	<b>Type</b>	<b>Dissemination level</b>	<b>Delivery date (in months)</b>
1.	Flood vulnerability assessment	<b>WP1</b>	UZ	R	PU	Month 12
2.	Report on risk management plans and necessary improvements	<b>WP1</b>	UL	R	PU	Month 9
3.	Analysis of best resilience practices	<b>WP1</b>	UZ	R	PU	Month 18
4.	Assessment of which drones are most suitable for different roles	<b>WP2</b>	UL	R	PU	Month 16
5.	Legal Suggestions for what situation in which mobile data can be accessed	<b>WP2</b>	UZ	R	PU	Month 9
6.	Mobile Warning System Setup	<b>WP2</b>	UZ	Other	CO	Month 16
7.	Integration of system with Sentinel-4 CEM	<b>WP2</b>	UZ	DEM	CO	Month 23
8.	Develop a website for the community to visualise flood zones	<b>WP3</b>	UZ	<b>DEC</b>	PU	Month 7
9.	Strategy and report on raising awareness with civic and religious institutions	<b>WP3</b>	MET	<b>R</b>	PU	Month 7
10.	Analyse simulation and report	<b>WP3</b>	NRPD	<b>R</b>	PU	Month 18
11.	Plan and report for displaced residents	<b>WP3</b>	ACPDR	<b>R</b>	PU	Month 20
12.	Report on pollutants within areas at risk of flooding	<b>WP3</b>	SEA	<b>R</b>	PU	Month 11
13.	Report on areas with harmful deforestation and recommendations for afforestation	<b>WP3</b>	WWFA	<b>R</b>	PU	Month 20

### 3.2 Management structure, milestones and procedures

The leading partner of the project, University of Zagreb, will ensure the management of the project. It has vast experience both in the field of project and in the leading of projects, financed by the European Union. The leading partners of each task have appropriate experience and capacity. The cooperation between the project partners will be established in the consortium contract.

The universities is a place where academic knowledge contributes to practical skills and vice versa. The fact that the lead partner of each task is a university, is no coincidence and will ensure effective innovation management, allowing academia to contribute to innovation management throughout the project. Regular meetings within project team and other partners will enhance the exchange of ideas, bringing together academia, non-governmental organisations, governmental institutions, local governments and society.

**Table 3.2a: List of milestones**

<b>Milestone number</b>	<b>Milestone name</b>	<b>Related work package(s)</b>	<b>Due date (in month)</b>	<b>Means of verification</b>
1.	Thematic flood vulnerability assessments are prepared	<b>WP1</b>	Month 8	Acceptance act of the initial assessments by UZ
2.	Flood vulnerability assessment is approved	<b>WP1</b>	Month 12	Approval of the final assessment by UZ
3.	Report on risk management plans and necessary improvements is approved	<b>WP1</b>	Month 9	Approval of the final report by UL
4.	Initial thematic reports on resilience practices are prepared	<b>WP1</b>	Month 11	Acceptance act of the initial reports by UZ
5.	Analysis of the best resilience practices	<b>WP1</b>	Month 18	Approval of the final report by UZ
6.	Starting drone fleet is selected	<b>WP2</b>	Month 16	Approval by UL
7.	Application system and system for warning is set up	<b>WP2</b>	Month 16	Approval by UZ
8.	Integrated system together	<b>WP2</b>	Month 20	Approval by UZ
9.	Integrated system with Sentinel-4	<b>WP2</b>	Month 23	Approval by UZ
10.	Media campaign within civic and religious institutions	<b>WP3</b>	month 12	Approval by MET
11.	Media campaign with multimedia institutions	<b>WP3</b>	Month 21	Approval by MET
12.	Train volunteers	<b>WP3</b>	Month 17	Approval by NPRD

13.	Simulation exercise with emergency services	<b>WP3</b>	Month 17	Approval by NPRD
14.	Second improved simulation with volunteers	<b>WP3</b>	Month 22	Approval by NPRD
15.	Community meetings to prevent the destruction of agricultural land	<b>WP3</b>	Month 9	Approval by SEA
16.	Cleanup weekend to remove pollutants from flood zone	<b>WP3</b>	Month 12	Approval by SEA
17.	Month-long tree planting activity	<b>WP3</b>	Month 21	Approval by WWFA

**Table 3.2b: Critical risks for implementation**

<b>Description of risk (indicate level of likelihood: Low/Medium/High)</b>	<b>Work package(s) involved</b>	<b>Proposed risk-mitigation measures</b>
Lack of overall coordination	WP1	Effective coordination is ensured by the managerial structure and through the project work plan. The coordinator has extensive experience in coordinating large EU and national projects. In case of unforeseen events, other experienced persons at the coordinating institute or at other partners can take over coordination tasks.
Ineffective overall management	All the WPs	Effective management is ensured through timely recruitment of a capable, expert and socially adept Project Manager (PM) with proven skills at managing large, complex projects. The PM will be given the resources and support needed to perform tasks effectively. Tasks of the PM and the coordinator will be delineated to ensure harmonious collaboration. In case of problems, the coordinator is a resolute problem solver.
Consortium disruption or conflicts in the Consortium	All the WPs	All partners have experience and proven track records in large collaborative and infrastructure projects. All are motivated to reach the project objectives, which have been defined in the common interest of all partners. Any partner not adhering to this common interest will be excluded from the project. A comprehensive Consortium Agreement (CA) will be formulated by all partners. The PM will follow strict administrative guidelines and implement actions against partners failing to comply with procedures agreed upon in the CA. The PM will maintain an easily searchable record of all relevant



		correspondence among partners to aid the coordinator in resolving conflicts. The coordinator has experience in conflict management in European Projects. All partners have a track record of solving emergent problems in a collegial spirit.
Delays in deliverables	All the WPs	The PM will use the tools necessary for effective monitoring of project progress. A system will be implemented to spot delays of critical deliverables (those that link to milestones) early; mitigating actions will be discussed with WP-partners involved to keep the project on time. Partners in WPs will appoint project personnel in time. When they possess spare capacity, failure of one will be mitigated quickly at others.
Coordination problems within individual WPs	All the WPs	All the WPs involve multiple partners, which collaborate to achieve their tasks in a timely manner. To achieve this, the work has been partitioned into internally coherent tasks with internal or deliverables. Task-leaders will monitor progress and flag problems in a timely manner to enable harmonious mitigation.
Unexpected leave of the Project Coordinator	All the WPs	The new PC will be found within the employees of the coordinating partner.

### 3.3 Consortium as a whole

The consortium will consist of academia, governmental institutions, local municipalities, and non-governmental institutions from three project countries: Croatia, Slovenia, Bosnia and Herzegovina. Considering the international scale of the problem, the project will include transnational cooperation.

Most of the consortium partners have carried out international projects or have participated in some. Therefore they are familiar with the procedures and requirements.

Each country is represented with local municipalities encountering the flood problem, governmental organisations in charge of environment, minimising damage from natural disasters and rescue, and non-governmental organisations dealing with sustainable development and nature protection. Moreover, considering the previous activities of the universities of Zagreb and Ljubljana in the field of flood management and technological innovation, they are chosen to be the task leaders.

The contract between all the members of consortium is concluded, and the responsibilities and tasks for each partner are stipulated in the contract. Therefore each partner has a clear set of responsibilities and can plan their work accordingly. The project management team will regularly contact the partners to make sure that the work plan is being followed.

### 3.4 Resources to be committed

**Table 3.4a: Summary of staff effort**

	WP1	WP2	WP3	Total Person Months
1. UZ	12	72	0.8	84.8
2. NPRD	14	0	28	42
3. SUNCE	11	0	0	11
4. MSB	1	0	0	1
5. MS	1	0	0	1
6. SEA	3	0	40	43
7. ACPDR	13	0	0	13
8. UL	3	48	20	71
9. SFSD	1	0	0	1
10. MK	1	0	0	1
11. ML	1	0	0	1
12. MET	11	0	20	31
13. WWFA	1	0	4	5
14. BD	1	0	0	1
Total Person Months	74	120	112.8	

**Table 3.4b: ‘Other direct cost’ items (travel, equipment, other goods and services, large research infrastructure)**

Does not apply.

#### 4. Members of the consortium

To ensure successful management and carrying out of the project, the consortium will consist of governmental institutions, local municipalities, and non-governmental institutions from three project countries: Croatia, Slovenia, Bosnia and Herzegovina.

##### 4.1. Participants (applicants)

Participant No	Participant organisation name	Description
1.	The University of Zagreb (UZ)	<p>The scientific activities of the Department of Geography include different research projects funded by national or international funding bodies. The results of those scientific activities are published as scientific publications in in different international journals. The staff of the Department cooperates with a number of different institutions, such as the National Bureau of Statistics, the Croatian Ministry of Agriculture, and the Croatian Ministry of Construction and Physical Planning.</p> <p>The Department will provide the project coordinator and other project administrative staff. The Department will be involved in numerous activities related to flood vulnerability assessment and analysing the best resilience practices in flood prevention, mitigation, and recovery. It will also be in charge of developing the Mobile Application Warning and Location Warning System, as well as the integration of Application and Drones Sentinel-4 CEM System. UZ will also lead the task of raising awareness of society, coordinating authorities, and involving society in flood management.</p>
2.	National Protection and Rescue Directorate (NPRD)	<p>NPRD prepares, plans and manages the operational forces and coordinates the activities of all participants of protection and rescue system. Thus it is the main institution in charge of rescue services and is highly involved in the implementation of the risk management plans. Therefore within the project its duty is to analyse the existing risk management plans and to prepare the initial report on the bottlenecks in the implementation of risk management plans.</p>

3.	SUNCE Associationa for Nature, Environment and Sustainable Development (SUNCE)	<p>Sunce is a non-profit organisation committed to the protection of nature and environment in Croatia. Main areas of its work are protected areas and Natura 2000 management, sustainable tourism, sustainable fisheries and waste management. It advocates for public participation, educates and informs public in order to change values and behavior, implements research in order to create background and guidance for protection measures and more effective action, and advocates responsible management based on the sustainable development.</p> <p>SUNCE will be engaged in identification of risks caused by flooding events, including risk for protected areas, traditional lifestyle and economies, and collecting the best resilience practices in flood prevention.</p>
4.	Municipality of Slavonski Brod (MSB)	<p>This municipality is located in Croatia in close vicinity to Bosnia and Herzegovina. Slavonski Brod is the sixth largest city in Croatia that has regularly suffered from vast flooding, of which the greatest were in 2010 and 2014.</p> <p>The Department for Construction, Physical Planning and Environmental Protection, which will be involved in the project, is responsible for municipal policy of spatial planning, environmental protection and protection and preservation of cultural goods.</p> <p>The local municipalities are the key partners in evaluation of the situation, and their expertise is needed to elaborate sustainable and feasible solutions for the identified problems. Therefore the municipality will take part in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, assessment of the risk management plans and preparation of the suggestions for improvement, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>
5.	Municipality of Sisak (MS)	<p>The city of Sisak is the tenth largest city in Croatia and is located at the confluence of the Kupa, Sava and Odra rivers. It is the 8th biggest city in Croatia and has regularly suffered from vast flooding. The Department for Physical Planning and Environmental Protection is responsible for development of the municipal policy of flood risk management.</p> <p>Along with other municipalities, it will be involved in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, assessment of the risk management plans and preparation of the suggestions for improvement, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>

6.	Slovenian Environment Agency (SEA)	<p>SEA monitors, analyses and forecasts natural phenomena and processes in the environment, and seeks to reduce natural threats to people and property.</p> <p>Its tasks include also reducing impact of natural hazards, guiding change of national and personal values system in relation to the environment as well as influencing the value criteria for environmental encroachments, and raising the awareness of people and institutions about the environment and environmental issues.</p> <p>SEA has regional offices. Considering it, the organisation will be involved into organising cleanup weekends to remove pollutants from flood zone, as well as in organising community meetings to prevent the destruction of agricultural land. SEA will also be involved in preparation of the flood vulnerability assessment, as well as preparing plan and report on removal of agricultural and industrial pollutants within areas at risk of flooding.</p>
7.	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR)	<p>ACPDR is responsible for the system of protection against natural and other disasters. It also performs rescue and relief tasks and assesses the damage caused by natural and other disasters, as well as performs post-disaster remediation and reconstruction. ACPDR is based in Ljubljana and has 13 branches operating throughout Slovenia. Within each branch there is a regional notification centre that performs a 24-hour duty service.</p> <p>ACPDR will be involved in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, collecting the best resilience practices in flood recovery, and planning and reporting for displaced residents.</p>
8.	The University of Ljubljana (UL)	<p>Since 2016 UL Faculty of Civil and Geodetic Engineering is hosting the UNESCO Chair on Water-related Disaster Risk Reduction. UL FGG has been involved in many EU research projects related to floods and fluvial erosion, as well as in the field of hydrology. UL FGG has established the Research Institute for Geo and Hydro Threats.</p> <p>UL will be involved in the assessing risk management plans, investigating the use of drones for emergency situations, and elaborating the prevention methods to protect cultural heritage and livelihoods.</p>

9.	Umanotera, The Slovenian Foundation for Sustainable Development (SFSD)	<p>SFSD's activities include environmental education and development of new social values and structures, strategic networking of governmental, non-governmental and economic actors, implementation of different projects aiming to raise societal environmental awareness, to mainstream low-carbon procurement, and to promote sustainable development in general.</p> <p>Considering the organisation's vast experience in the involvement and activation of the society, in the project SFSD will contribute in preparation of the flood vulnerability assessment, preparation of the report on the risk management plans, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>
10.	Municipality of Kranj (MK)	<p>Kranj is the fourth largest city in Slovenia that has suffered the most in flash flood of 2014. It is highly interested in minimizing the probability of flood and mitigating the consequences. Because of the close geographical location, it has cooperation with Ljubljana municipality in flood risk management.</p> <p>Along with other municipalities, it will be involved in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, assessment of the risk management plans and preparation of the suggestions for improvement, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>
11.	Municipality of Ljubljana (ML)	<p>The capital of Slovenia Ljubljana lies in the southern part of the Ljubljana basin, crossing the moor. It has suffered from flooding regularly. Many parts of the urban area are heavily threatened by the floods. Intensive urbanization poses danger to the functioning of flood protection measures.</p> <p>The Department for Protection, Rescue and Civil Defense creates a system of protection and rescue and carries out operational tasks.</p> <p>The Department of Environmental Protection assesses the vulnerability and risks of environment and nature. It also deals with raising awareness, disseminating information and educating the society.</p> <p>Along with other municipalities, the departments of the municipality of Ljubljana will be involved in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, assessment of the risk management plans and preparation of the suggestions for improvement, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>

12.	Ministry of Environment and Tourism (MET)	<p>MET is the leading governmental organisation in Bosnia and Herzegovina dealing with environmental protection. MET carries out tasks related to environmental protection and elaborating the environment and tourism policies. It has a sector responsible for environmental protection, a sector responsible for environmental impact assessment, and several sectors dealing with tourism. It has participated in various projects to develop technological solutions in order to reduce the negative impact of events to local resources.</p> <p>MET will be involved into analysing the influence of flooding on the local economies, collecting the best resilience practices in flood mitigation and awareness raising campaigns with media, civic and religious institutions.</p>
13.	World Wide Fund For Nature Adria (WWFA)	<p>WWFA in Bosnia and Herzegovina is engaged in the protection of long-term sustainability of freshwater ecosystems, cooperating with the hydropower developers, financial institutions, legislators, and society. It concentrates also on legal framework for planning and mobilising civil society.</p> <p>WWFA is active also in the field of forests management and protected areas. It promotes responsible management of forests in the relevant ministries and academia and issues FSC certification for forests. It also seeks to strengthen the capacity of staff in national parks and to implement sustainable tourism principles and activities.</p> <p>In the project WWFA will elaborate a report on areas with harmful deforestation and recommendations for afforestation and raise awareness for afforestation.</p>
14.	Local government of Brčko District (BD)	<p>Brčko District is a self-governing administrative unit in north-eastern Bosnia and Herzegovina. It was formed of territory, of which 48% was in the new formed Republika Srpska, while 52% was in the old Federation of Bosnia and Herzegovina, and is inhabited by many nations. However, in reality it functions as a local self-government area. The Department of Agriculture, Forestry and Water Management is engaged in the protection and improvement of forests. The Department for Spatial Planning and Property and Legal Affairs is responsible for environmental protection and protection of objects of cultural and historical significance and natural heritage.</p> <p>Along with other municipalities, BD will be involved in the preparation of the flood vulnerability assessment about the areas and infrastructure at risk, assessment of the risk management plans and preparation of the suggestions for improvement, and preparation of the analysis of best resilience practices in flood prevention, mitigation, and recovery.</p>

#### 4.2. Third parties involved in the project (including use of third party resources)

No third parties involved.

## **5. Ethics and Security**

### **1.1 Ethics**

#### **Self-assessment**

The project's chosen countries of involvement are the EU member states Croatia and Slovenia and the EU accession state Bosnia and Herzegovina. For all three countries, the proposal meets the European Union's legal and ethical frameworks.

The project deals with human participants:

- Work Package 3's Milestones 12, 13 and 14 involve the recruitment of volunteers. They will be selected based upon their application and suitability. The volunteers will be required to sign consent forms.
- Work Package 3's Milestones 16 and 17 involve the recruitment of volunteers. The volunteers will be required to sign consent forms.

The project seeks to analyse certain protected areas and areas that contain endangered fauna and flora. The project will not in any way threaten or harm these areas.

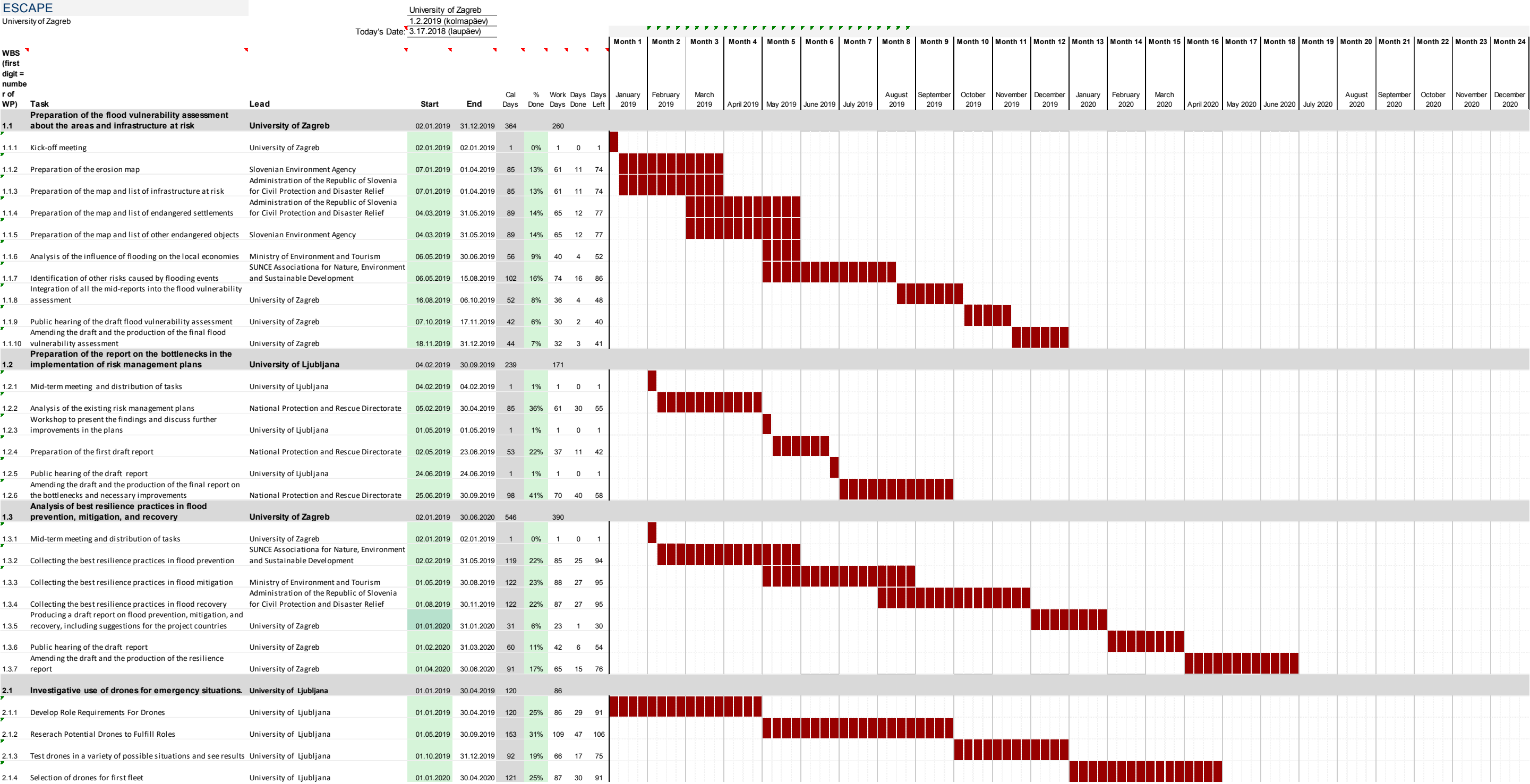
### **1.2 Security**

Project will involve:

- activities or results raising security issues: NO
- 'EU-classified information' as background or results: NO



Appendix 1. Gantt Chart. ESCAPE



2.2	Mobile Application Warning and Location Warning System	University of Zagreb	01.01.2019	30.04.2019	120		86																																																																									
2.2.1	CEM Data Frame and How It Works	University of Zagreb	01.01.2019	30.04.2019	120	25%	86	29	91	[Progress Bar]																																																																						
2.2.2	Legal Expertise and Privacy Advisors	University of Zagreb	01.05.2019	30.09.2019	153	31%	109	47	106	[Progress Bar]																																																																						
2.2.3	Development of Application	University of Zagreb	01.10.2019	31.12.2019	92	19%	66	17	75	[Progress Bar]																																																																						
2.2.4	Testing Application	University of Zagreb	01.01.2020	30.04.2020	121	25%	87	30	91	[Progress Bar]																																																																						
2.3	Integration of Application and Drones Sentinel-4 CEM System	University of Zagreb	01.05.2020	31.12.2020	245		175																																																																									
2.3.1	Test Basic System	University of Zagreb	01.05.2020	31.07.2020	92	33%	66	30	62	[Progress Bar]																																																																						
2.3.2	Analyze Results	University of Zagreb	01.08.2020	30.09.2020	61	33%	66	20	41	[Progress Bar]																																																																						
2.3.3	Improve and Localize	University of Zagreb	01.10.2020	31.12.2020	92	33%	66	30	62	[Progress Bar]																																																																						
3.1	Raising awareness of society, coordinating authorities, and involving society in flood management	University of Zagreb	01.01.2019	31.12.2020	731		699																																																																									
3.1.1	Develop a website for the community to visualse floodzones	University of Zagreb	01.06.2019	31.07.2019	61	6%	43	3	58	[Progress Bar]																																																																						
3.1.2	Update and maintain website	University of Zagreb	01.08.2019	31.12.2020	519	53%	371	275	244	[Progress Bar]																																																																						
3.1.3	Strategy and report on raising awareness with civic and religious institutions	Ministry of Environment and Tourism	01.03.2019	31.07.2019	153	16%	109	23	130	[Progress Bar]																																																																						
3.1.4	Media campaign within civic and religious institutions	Ministry of Environment and Tourism	01.08.2019	31.12.2019	153	16%	109	23	130	[Progress Bar]																																																																						
3.1.5	Media campaign with multimedia institutions	Ministry of Environment and Tourism	01.07.2020	30.09.2020	92	9%	66	8	84	[Progress Bar]																																																																						
3.1.6	Conference on project results and best practices	University of Zagreb	20.12.2020	21.12.2020	2	0%	1	0	2	[Progress Bar]																																																																						
3.2	Improving the coordination and reaction of authorities	University of Zagreb	01.04.2019	31.12.2020	641		459																																																																									
3.2.1	Plan emergency response training for evacuation	National Protection and Rescue Directorate	01.10.2019	31.12.2019	92	14%	66	13	79	[Progress Bar]																																																																						
3.2.2	Train volunteers	National Protection and Rescue Directorate	01.01.2020	31.05.2020	152	38%	108	58	94	[Progress Bar]																																																																						
3.2.3	Simulation exercise with emergency services	National Protection and Rescue Directorate	01.5.2020	31.5.2020	31	7%	21	2	29	[Progress Bar]																																																																						
3.2.4	Analyse simulation and report	National Protection and Rescue Directorate	01.06.2020	30.06.2020	30	8%	22	2	28	[Progress Bar]																																																																						
3.2.5	Second improved simulation with volunteers	National Protection and Rescue Directorate	01.10.2020	31.10.2020	31	8%	22	2	29	[Progress Bar]																																																																						
3.2.6	Plan and report for displaced residents	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief	01.07.2020	31.08.2020	62	16%	44	9	53	[Progress Bar]																																																																						
3.3	Prevention methods to protect cultural heritage and livelihoods	University of Ljubljana	01.04.2019	31.12.2020	641		459																																																																									
3.3.1	Planning the removal and temporarily storage of cultural artefacts	The University of Ljubljana	01.10.2019	30.11.2019	61	14%	44	8	53	[Progress Bar]																																																																						
3.3.2	Community meetings to prevent the destruction of agricultural land	Slovenian Environment Agency	01.04.2019	30.09.2019	183	43%	131	78	105	[Progress Bar]																																																																						
3.3.3	Plan and report on removal of agricultural and industrial pollutants within areas at risk of flooding	Slovenian Environment Agency	01.10.2019	30.11.2019	61	14%	44	8	53	[Progress Bar]																																																																						
3.3.4	Cleanup weekend to remove pollutants from flood zone	Slovenian Environment Agency	01.12.2019	31.12.2019	31	7%	22	2	29	[Progress Bar]																																																																						
3.3.5	Report on areas with harmful deforestation and recommendations for afforestation	World Wide Fund For Nature Adria	01.07.2020	31.08.2020	62	14%	44	8	54	[Progress Bar]																																																																						
3.3.6	Month-long tree planting activity	World Wide Fund For Nature Adria	01.09.2020	30.09.2020	30	7%	22	2	28	[Progress Bar]																																																																						

Appendix 2:  
ESCAPE: Pert Chart

Kickoff Meeting

Media Campaign

Preparation of the flood vulnerability assessment about the areas and infrastructure at risk

Preparation of the report on the bottlenecks in the implementation of risk management plans

Analysis of best resilience practices in flood prevention, mitigation, and recovery

Prevention methods to protect cultural heritage and livelihoods

Raising awareness of society, coordinating authorities, and involving society in flood management

Investigative use of drones for emergency situations.

Mobile Application Warning and Location Warning System

Data Integration of Application and Drones to Sentinel-4 CEM System

Improving the coordination and reaction of authorities

