



IMPLEMENTATION OF GREEN INFRASTRUCTURE PRINCIPLES AS A TOOL FOR MINIMIZATION OF CLIMATE CHANGE PROBLEMS

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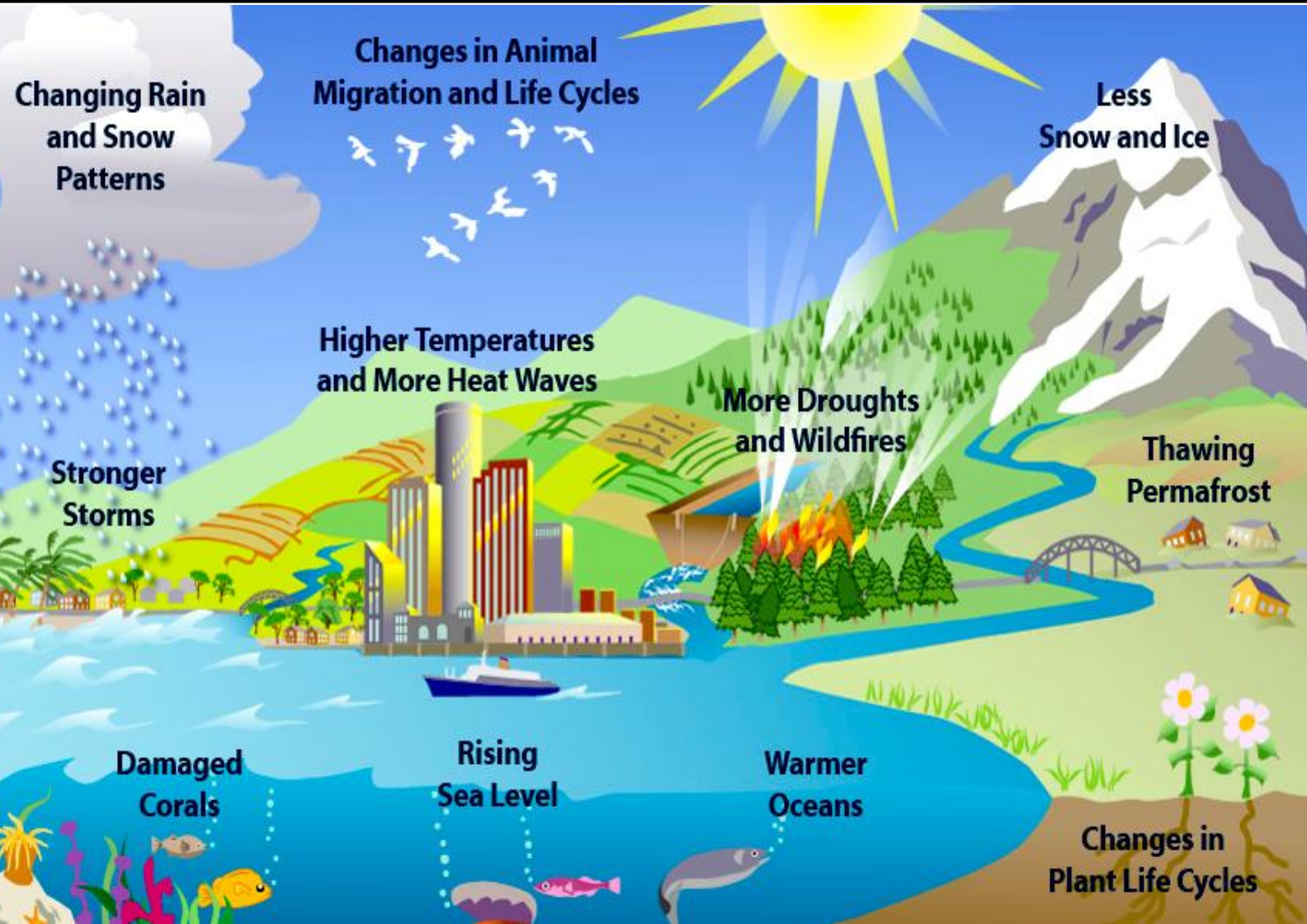
GREEN INFRASTRUCTURE DEFINITION

Green Infrastructure can be broadly defined as a strategically planned network of high quality natural and semi-natural areas ... in both rural and urban settings (European commission, 2013)

Climate change and green infrastructure presents new challenges for urban cities and their sustainability. Many authors have been dealing with problems of climate change and possible solutions concerning green infrastructure (heat islands, flooding, higher wind speeds, episodic rainfall)

(Brown et al., 2015; Demuzere et al., 2014; Gill et al., 2007; Byrne et al., 2015; Mathews et al., 2015; Byrne & Young, 2009; Foo et al., 2015; Emamanuel & Loconsdale, 2015; Bowler et al., 2010; Roy et al., 2012)

GREEN INFRASTRUCTURE SCHEME



Climate
Change
Factors

www.planetsave.com

GREEN INFRASTRUCTURE DEFINITION

Main question:

What are possibilities in implementation of green infrastructure principles in a purpose of mitigation negative climate change effects?

METHODOLOGY

Two interlinked methodological approaches were made: review of the scientific and specialised literature and spatial analysis of the urban footprint

Preliminary study of the development of six settlements on Mediterranean Croatian coast

The town Dubrovnik was selected as a main object for this research because it shows all targeted environmental problems (visible in other towns conducted within this study).

Development of digital database

Detailed analytical exploration (digital database, literature and historical maps)

Development of map of ecologically critical zones

Synthesis phase

Set of guidelines for further development of concepts of urban green infrastructure

CASE STUDY DUBROVNIK

Topography is characterised by a hilly landscapes which are built on the areas with most suitable qualities for construction. Therefore, hill tops are still naturally green preserved. The coast is preserved along the steep zones, especially along the cliff areas.



CASE STUDY DUBROVNIK

Touristic town with enormous development pressure

Non strategic urban development caused space degradation

Lately, many environmental problems connected with climate change have occurred. Many of these problems are connected with loss of green spaces.

Storm waters cause floods which disable normal urban life. Floods are connected to the issues of deficiency of absorptive surfaces within the urban area (green zones). Disappearance of green spaces are connected with enhance urban heat and stronger winds. Loss of woodlands (urban construction, fires) enhances the problems of soil erosions on steep areas within the urban zone.

CASE STUDY DUBROVNIK



storms, floods

CASE STUDY DUBROVNIK



strong winds

CASE STUDY DUBROVNIK REGION



fires

CASE STUDY DUBROVNIK AND DALMATIAN REGION



soil erosion, land slides

GREEN AREAS DEVELOPMENT

1910



1988



2003



Case study Dubrovnik

MAP OF ECOLOGICALLY PROBLEMATIC ZONES



red – flood area, purple – soil erosion, blue – strong winds

Case study Dubrovnik

URBAN GREEN INFRASTRUCTURE SCHEME



- existing urban parks
- existing sport recreation
- existing cemetery
- UGI interventions within grey zone
- new green areas
- existing green (natural) zones
- new green connection - wedge
- - - green circular connection
- highly important implementation UGI
- new green lines along street corridors

THREATENED URBAN LANDSCAPES



FRAMEWORK FOR USING URBAN GREEN INFRASTRUCTURE

Step 1. Identifying the urban green infrastructure plan of the whole town

Step 2. Maximising the mitigation of climate change problems within existing green and grey areas

Step 3. Characterisation of priority zones within the new elements of Urban Green Infrastructure Plan

Step 4. Developing the hierarchy of other new green spaces for development of urban green infrastructure as socio ecological concept

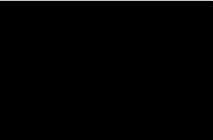
Step 5. Integration of urban green infrastructure on all scales

CONCLUSIONS

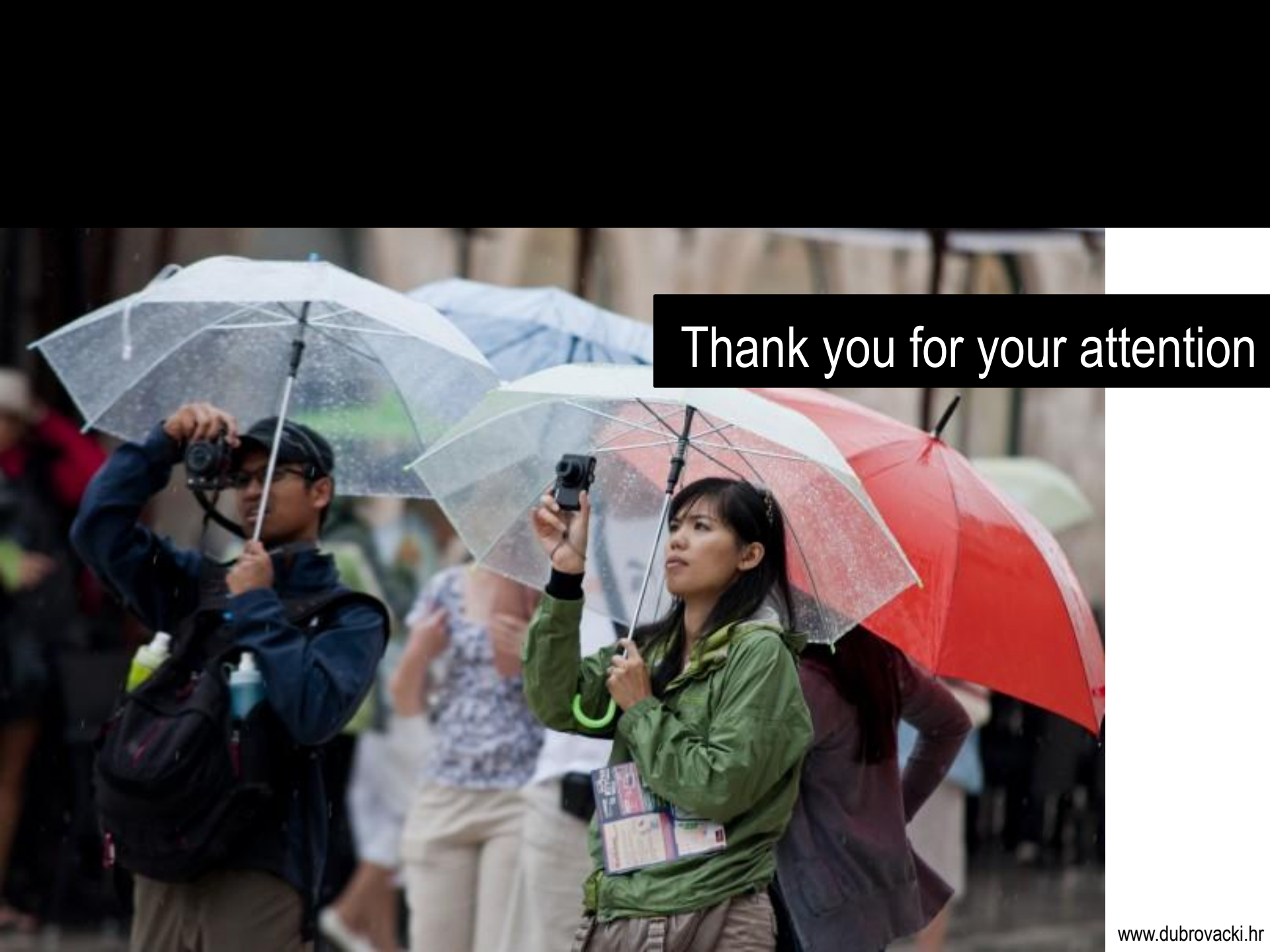
Intense storms, floods, soil erosion, strong winds, heat waves are all interconnected and there are possibilities for its mitigation with green infrastructure implementation

Determination of climate change problems and its causality is very important step for understanding situation and development of possible solutions (usefull for planners and designers)

CONCLUSIONS



This research represents, justifies and applies a model of application of urban green infrastructure but with certain limitations. As a model, it needs lots of work to be done in detecting maybe even new meanings and possibilities of urban green infrastructure for every new situation and location. Nevertheless, there is sufficient information and data for cities governments to start the process of mitigation negative effects of climate change through application of urban green infrastructure principles.



Thank you for your attention