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Supplement of

Flood damage: a model for consistent, complete and multipurpose scenarios

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3

4 **Supplement: The 2012 flood in the Umbria Region – Reported damage**

5

EXPOSED SECTOR	SPATIAL SCALES OF ANALYSIS			
	Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
population	physical damage	X	INJURED PEOPLE: some people suffered because of humidity in residences or work places	
	evacuated people		EVACUATED PEOPLE: 255 evacuated families in 11 municipalities, most of them from Marsciano (90 families) and Todi (70 families).	
	psychological distress	STRESS: some business owners suffered of stress		
	unemployment, loss in salary, etc.			JOB DISRUPTION (INVESTIGATED SITES): some business owners declared layoff during business disruption
	lack of services		LACK OF SERVICES (SCHOOLS AND HOSPITAL)	LACK OF SERVICES (TRANSPORTATION, ELECTRICITY, AND SEWAGE SERVICE)

EXPOSED SECTOR		SPATIAL SCALES OF ANALYSIS			
		Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
infrastructures (installations and lines)	roads	physical damage	PHYSICAL DAMAGE TO ROADS AND BRIDGES 12.200.000 €		
		functional disruption		DISRUPTED ROADS: data on closed roads in each municipality	DISRUPTED ROADS: disruption for goods transportation by trucks: 10 days
		physical and functional systemic damage		X	X
	railways	physical damage	PHYSICAL DAMAGE: - observed damages: railways, train deposits, stations, mechanic workshops 1.100.000 €		
		functional disruption		X	X
		physical and functional systemic damage		X	X
	electricity	physical damage	PHYSICAL DAMAGE: - observed damages: fell down of trellis, removed cables along riversides, damaged electrical cabins 600,000 €		

EXPOSED SECTOR		SPATIAL SCALES OF ANALYSIS			
		Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
		functional disruption		USERS WITHOUT ELECTRICITY AND DURATION OF DISRUPTION: - 13 municipalities affected by the electrical service disruption - number of users without electricity and number of hours without electrical service in each municipality (see Table 3)	NUMBER OF MUNICIPALITIES WITH ELECTRICITY DISRUPTION 15 municipalities
		physical and functional systemic damage		FUNCTIONAL DAMAGE: prolonged disruption because of inaccessibility	X
		water and sewage	physical damage	PHYSICAL DAMAGE: - observed damages at individual items: sewage pipelines, wells, purification plants, pumps, remote control devices 1.200.000 €	
	functional disruption			X	X
	physical and functional systemic damage			X	FUNCTIONAL DAMAGE: disruption of wells because of inaccessibility
	public services	schools	physical damage	PHYSICAL DAMAGE TO BUILDINGS - type of damaged schools (kindergartens, primary schools, high schools) - type of damage to each school (e.g. building) 200.000 € in 7 municipalities	

EXPOSED SECTOR	SPATIAL SCALES OF ANALYSIS				
	Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)	
	functional disruption	X	DAYS OF CLOSURE - 39 schools remain closed after two days - 7 schools remain closed after five days	not occurred	
	physical and functional systemic damage		X	X	
	health and care services	physical damage	not occurred		
		functional disruption	not occurred	not occurred	not occurred
		physical and functional systemic damage		INACCESSIBLE HOSPITALS: Orvieto Hospital inaccessible for about 12 hours on the day of the flood event due to roads disruption	not occurred
	governmental services	physical damage	PHYSICAL DAMAGE TO PUBLIC BUILDINGS - damages to public buildings (educational buildings excluded): 1 sport facility; 3 governmental buildings; 5 public buildings. 70.000 € in 6 municipalities		
		functional disruption	not occurred	not occurred	not occurred
		physical and functional systemic damage		X	X

EXPOSED SECTOR		SPATIAL SCALES OF ANALYSIS			
		Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
economic activities	agriculture	physical damage	PHYSICAL DAMAGE TO CROPS, STRUCTURES AND INFRASTRUCTURES: - total cost to infrastructures: 12.000.000 € - total cost to structures: 950.000 €		
		functional disruption	X		
		physical and functional systemic damage	X		
	industries and commercial activities	physical damage	PHYSICAL DAMAGE TO BUILDINGS AND CONTENTS: - 167 investigated activities in 3 municipalities - observed damages: doors and windows, floors, plasters, walls, damage due to humidity, plants, machineries, stokes, loss of memorabilia, vehicles, documents - tot damage: 3.500.000 € + 400.000 € (private contributions by trade union) - total damage at regional level around: 5.000.000 €		

EXPOSED SECTOR	Type of damage	SPATIAL SCALES OF ANALYSIS		
		Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
	functional disruption	<p>DISRUPTION OF BUSINESS:</p> <ul style="list-style-type: none"> - 167 investigated activities in 3 municipalities - average business disruption 13 days - fully operative after 3 months - negative trends in the production for several months (uncountable) 	X	X
	physical and functional systemic damage	X		
private properties (residences and cars)	physical damage	<p>PHYSICAL DAMAGE TO BUILDINGS AND CONTENTS:</p> <ul style="list-style-type: none"> - 77 investigated buildings in 2 municipalities - observed damages: plasters, windows and doors, floors, electrical plants, furniture, clean-up (1-30 person/day), loss of memorabilia, cars - tot costs at regional level (19 municipalities) 3.000.000 € (17/04/2014) 		
	functional disruption	<p>USABILITY:</p> <ul style="list-style-type: none"> - 77 investigated buildings in 2 municipalities - buildings were not usable for 2-7 days in average 		

EXPOSED SECTOR		SPATIAL SCALES OF ANALYSIS			
		Type of damage	Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
Environmental and cultural heritage	Environment	physical and functional systemic damage	USABILITY - 175 isolated buildings in 10 locations because of damage to roads		
		loss of value		X	
		physical damage	PHYSICAL DAMAGE TO GREEN PATHS AND GREEN AREAS: 70.000 € PHYSICAL DAMAGE TO A NATURAL PARK -touristic path, bridges, bird-watching houses, trees, fauna, damage to river banks and levees 150.000 € (estimated by the park) - hydraulic network: 24.500.000 €	not occurred	PHYSICAL DAMAGE TO FAUNA DUE TO MIGRATION (UNCOUNTABLE)
		functional disruption	DISRUPTION OF RECREATIONAL ACTIVITIES OF THE NATURAL PARK - 1 month LONG-TERM NEGATIVE TRENDS OF RECREATIONAL ACTIVITIES OF THE NATURAL PARK	not occurred	not occurred

EXPOSED SECTOR	Type of damage	SPATIAL SCALES OF ANALYSIS		
		Individual item	Municipality	Meso - Macro scale (Province, Region, Country)
cultural heritage	physical and functional systemic damage		INDUSTRIAL TOXIC WASTE DISPOSAL: 1.000.000 € (above all in Orvieto)	not occurred
	physical damage	PHYSICAL DAMAGE: observed damages: walls and historical buildings 600.000 €	not occurred	not occurred
	functional disruption	not occurred	not occurred	not occurred
	physical and functional systemic damage		X	X
Civil Protection	costs of emergency services		COSTS OF EVACUATION, SHELTERS, RESCUE, RESTORATION, ETC.	COSTS OF EVACUATION, SHELTERS, RESCUE, ETC. - 14 Municipal Emergency Rooms open - 1 Regional Emergency Rooms open - 15 tactical operation centers open - 45 Volunteer Organizations activated - 500 Volunteers (50 Volunteers/day) activated - total cost of evacuation: around 150.000 €

6

7 **Legend:**

8 X= data and/or monetary value desired, but currently not available