

AMPER - Analysing and modelling post-earthquake reconstruction processes: a support to regional policies

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PART A

1 - Research Project Title

AMPER - Analysing and modelling post-earthquake reconstruction processes: a support to regional policies

[Multi-level analysis of post-disaster recovery: theory, models and policy]

2 - Duration (months)

three years

3 - Main ERC field

SH - Social Sciences and Humanities

4 - Possible other ERC field

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5 - ERC subfields

SH3_7 Spatial development, land use, regional planning

SH1_11 Industrial organization; strategy and entrepreneurship

SH2_1 Social structure, social mobility

6 - Key Words

VULNERABILITY, RESILIENCE AND NATURAL DISASTERS

SOCIAL NETWORK ANALYSIS AND COMPUTATIONAL MODELS IN SOCIAL SCIENCE

REGIONAL AND SPATIAL ECONOMETRICS

MOBILITY PATTERNS

CONTENT ANALYSIS OF ON LINE SOCIAL NETWORKS

7 - Principal Investigator

Margherita Russo, University of Modena e Reggio Emilia

8 - List of the Research Units

Modena and Reggio Emilia, Udine, Padua

9 - Research project abstract

(Max 3.000 characters including spaces)

The AMPER project aims to identify the main socio-economic and political drivers that affect the resilience of an area affected by an earthquake, in order to model and monitor the reconstruction processes at regional level. In particular, the project will develop analyses and a set of statistical and computational models, experiments and tools to improve the allocative efficiency of public and private resources. The project focusses on how agents (household, entrepreneurs, policy makers) and local communities react to cope with the effects of a natural disaster. Firstly, socio-economic and demographic structure will be analysed, with the aim of assessing: the spatial and temporal adjustment of supply and demand; possible bottlenecks in the reconstruction process; the emerging innovative dynamics, providing insights for local public policies. Secondly, we will turn our attention on daily living patterns, which might have

changed due to damages to houses, re-localization of labour venues and of schools, health services, commercial and personal services. Specifically, our analysis of the network dynamics will explore the impact of the earthquake on the mobility of users. Thirdly, we will analyse the reconstruction of social capital from three different perspectives: the social network of agents (re)producing it; cooperation attitudes of individuals; contribution of local public policies in reshaping the local identity and the way social media users perceive these interventions.

Merging the insights from our empirical research, we will run simulations from a computational model reconstructing an “artificial earthquake area”. This agent-based model will include several dimensions of heterogeneity and account for dynamics happening at different spatial and temporal scales. Scenario analysis based upon this model will uncover the effects of a diverse range of local policy interventions and their spatial spill-overs and the micro-foundations of the post-disaster reconstruction processes.

To achieve these objectives, the project will profit from a wide set of quantitative and qualitative information: i) open data on the reconstruction process; ii) survey and census data; iii) “big” data on online social networks (taking Twitter as a proxy of social capital) and on individual car mobility (using GNSS devices); iv) interviews to public and private stakeholders, involved in the post-earthquake reconstruction. Although empirical analysis and model calibration are based upon the reconstruction after the 2012 earthquake in Emilia (serving as a “living” laboratory), we generalise our outcomes to provide suggestions for any other natural disasters.

The consortium shares diverse and complementary competences whose joint application will be pivotal in the success of this project. They comprise economics, dynamical modelling and informatics, statistics and sociology of new media.