CSoI Seed Data Science Interdisciplinary Grant Proposal:

Improving the Distribution of Disaster Emergency Assistance Programs in the USA Based on Major Disasters Data Mapping 2008-2017

Research Team:

Migration Research/International Relations **Szymon Parzniewski**
Faculty advisor: Jenny Phillimore
sxp459@bham.ac.uk (PhD candidate, University of Birmingham)

Migration Research/Social Policy **Andrew Jolly**
Faculty advisor: Lisa Goodson
axj502@bham.ac.uk (PhD candidate, University of Birmingham)

Economics/International Relations **Anh Nguyen**
Faculty advisor:
anguyen3@brynmawr.edu (Bryn Mawr College)

Computer Science **Ashim Paudel**
Faculty advisor:
ashim.paudel@bison.howard.edu (Howard University)

Total Funds Requested: $5,540

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I. BACKGROUND AND PROBLEM STATEMENT

A. Background

The sum of damages caused by natural disasters in 2017 in the USA is estimated to be around $306bn. In the recent months, there has been a focus in the media and political discourse about the effectiveness of post-disaster reconstruction in Puerto Rico. These recent events can impact the political activism among the members of the diaspora and potentially influence the outcome of midterm elections in November 2018. There have been several studies that estimated the population displacement post-2017 Hurricane Maria and simulation scenarios based on the GSM data, monthly domestic arrivals, departures from Puerto Rican airports, and cumulative net domestic air passenger balance.

The project builds upon this pertinent issue and proposes a more detailed analysis of the structural conditions and potential inequalities that are hidden in FEMA's project implementation across different states affected by disasters from 2008 until 2017. There needs to be a better understanding on the real needs of individual households and the distribution of disaster relief assistance. The comprehension of the three elements can shed a light about disaster assistance for policy-makers. Through the analysis of the interlinkages based on a range of available data sources and data mapping our goal is to address the challenges deriving form potential inequalities and improve disaster relief project delivery.

Data sources used will include the FEMA Individual Disaster Assistance Data, the US Small Business Administration Disaster Assistance Loans and the Zip Code Atlas, Area Code, City & State Profiles available from zipatlas.com

B. Problem statement

While we are generally interested to analyse a range of data sources helping to understand the current state of disaster assistance and challenges that derive from the rising role of migration and diversity, we intend to look into specific key points. Those include:

Addressing diversity and inequalit(ies) in disaster relief provision: building upon the previous research and initial data exploration for the project we intend to pursue three directions:
1. Discrepancies in disaster assistance provision: the initial data exploration showed some clear indications that the distribution of assistance provision can be a reason for concern. Our goal is to find indicators within the available data that would enables us to address the role of diversity and inequality;
2. Minimizing the inequality in emergency assistance provision: based on the distribution of disaster relief assistance in relation to mapping the household income in the city districts that were most affected by the disaster.

II. PROPOSED ACTIVITY

We seek to bring together our respective expertise: Anh - international relations and economics; Andy - social policy, migration, community work; Ashim - computer science; Szymon - migration,

foreign languages in order to seek a more detailed and systemic understanding of the disaster assistance funds allocations, and suggest ways to improve the policy-making in order to improve the service provision. The proposed research project will require constant interaction among the team members. Anh is based in Philadelphia, Ashim in Seattle, Andy and Szymon in Birmingham (UK). We will use a range of collaboration tools to hold virtual meetings as well as give talks in our respective institutions. Andy and Szymon will be also holding seminars introducing the vibrant and diverse international postgraduate community in Birmingham to our ideas and goals.

III.   EXPECTED OUTCOMES AND TIMELINES

The goal of the stage I proposal is to bring together our respective knowledge and obtain some preliminary results that will set the foundations for a stage II and stage III of the project.

Short Term Outcomes - stage II (six-eight months)
1. Household disaster emergency assistance post Hurricane Marria: by looking primarily at Puerto Rico and Florida. Based using the data mapping techniques learned in the course we will develop a better understanding of the project implementation and scope of disaster relief provision;
2. Diversity and inequality in disaster assistance: in the first part of the project we will seek to bring together our expertise for the best study design, improved coding and encoding of the available data to show the different layers of disaster emergency assistance.

Medium Term Outcomes - stage III (eight months to 18 month)
1. Stage II proposal addressing the structural conditions of disaster relief policy-making in different geographical locations across the USA. We seek to address fundamental questions which can have far reaching consequences helping to address the inequalities in disaster assistance provision and bringing more diversity into the disaster relief policy-making.
2. The team will start to work immediately on a working research papers which will be submitted to present at the conference panels addressing the role data science in migration and disaster research/sociology to be presented at a major conference. Based on the feedback received we are aiming to submit the draft paper to an A journal by the end of 2018.

IV.   PROPOSED WORK STATEMENT

Anh and Ashim will lead on the data coding and visualizations. Because Szymon and Andy have their expertise in research project development, interdisciplinary community work and social policy they will lead the work on ensuring the policy relevance of the data analyzed; setting the research findings within the broader social policy-making, making sure that it fits well with the Centre's Economic research area focus. All team members will work together on positioning the research within the main theoretical foundations and current academic debates. We intend to have regular Skype brainstorming sessions allowing us to exchange the views, monitor the work progress and plan future tasks. In addition, we will be trying to identify

additional sources of funding and draft funding applications to ensure the financial independence of the research project.

V.   DIVERSITY STATEMENT

The research team follows the diversity goal of NFS:
- One member of the research team is female;
- The research team is made up of 2 PhD students and 2 undergraduate students;
- Three members are international students and one student is US citizen with migration background;
- Two members are majoring in social science, one in economics and one in computer science.

VI.   PROPOSED BUDGET AND JUSTIFICATION

The total proposed cost for phase two of the project is $5,540 (see appendix one for cost breakdown). This will include costs of accessing data, travel and accommodation costs for two conference/workshops to present the data, and the processing fees for one journal article.

We propose that this will be a pilot study for a larger project which will take a comparative approach to understanding migration and disaster relief using post/zipcode data for disaster relief assistance and median income.

Potential funders to approach for phase three include the Alfred P. Sloan Foundation and the Economic and Social Research Council

VII.   RESEARCHER PROFILES

A. Szymon Parzniewski

Given the role of migration in modern societies there is a limited empirical social research on integrating migrants in resilience, emergency response and disaster risk reduction (DRR) efforts, which means that a greater understanding of the contemporary features of resilience policy-making is required. In my PhD research I am looking at a comparative case study of Birmingham (UK) and Toyama (Japan). In this proposal we are aiming to understand better and map the disaster relief assistance in the USA based on the data available from a longitudinal perspective in order to address the potential inequalities that might be a result of the policy implementation. I personally benefit a lot from this interdisciplinary research project by improving my skills in using R, which I believe can open new opportunities for me to incorporate different sources of data and to look into my research from a new perspective.

B. Andrew Jolly

I am a PhD researcher at the University of Birmingham, and my research focuses on the issues of household food security and access to social protection for undocumented migrants. This research project will help me to understand the ways in which natural disasters contribute to the 'illegalisation' of migrants, and how disaster relief can better respond to superdiverse contexts.

I'm also interested in better understanding interdisciplinary perspectives and integrating mixed methods approaches into my research.

C. Anh Nguyen

Growing up in South Florida, I had always been prepared for the next incoming hurricane or natural disaster. My interest in disaster recovery/aid came from my observation of the environment around me. With my background in Economics and International Studies at Bryn Mawr College, I wish to expand upon my knowledge on how the government and non-profit organizations contribute to citizens that request aid in times of need after a natural disaster. In addition, I want to utilize my technical skills in R to find correlations in the amount of aid given to various variables. In my spare time, I explore the historical landmarks within Philadelphia and kayak in the Schuylkill River.

D. Ashim Paudel

My dream to explore outside of my home country, Nepal, came true when I was accepted into Howard University. There, I studied Computer Science and graduated in 2018. Outside of academics, I wanted to observe the wealth disparity between The United States and Nepal because I had always envisioned the US to be a land of opportunity and growth. With this research project, I utilized my R, Python, Jupyter, and Paraview to create the visualization showing the amount of aid and income within Puerto Rico and Florida. As hobbies, I play ping pong, ride my bike, and explore open source software.

VIII.   REFERENCES

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IX.   BUDGET

Item	Cost	Notes
Travel Option 1*	$4,000	4 x overseas flights (2x flights from the US; 2x flights from the UK)
Travel Option 2	$2,800 $300 $900	2 x flights from US to UK 4 x off peak return train tickets from London to Birmingham 4 x budget return plane tickets within Europe
Conference costs (registration and lodging)	$2,000	4 x conference registration fee + lodging *(four graduate students will co-present results of the research at this conference)*
Total:	**$6,000**	

*Preliminary budget including either Travel Option 1 or 2 dependent of conference paper acceptance

X.   PROJECT STAGE 1 TIMELINE

Step 1: Data science workshop, mapping disaster relief and income for Puerto Rico, Florida (2017)

Step 2: Mapping disaster relief and income for all US states (2008-2017)

Step 3 Preparation and presentation at interdisciplinary migration research conference in UK

Step 4 Revision of paper following conference feedback and submission to Journal

May 2018

June - October 2018

November - December 2018

January – March 2019