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Big Data for flood management: Realising the benefits for developing countries

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Agenda 2030 goal 11 commits towards making disaster risk reduction an integral part of sustainable social and economic development. Flooding poses some of the most serious challenges in front of developing nations by hitting hardest to the most vulnerable. Focussing on the urban poor, frequently at highest risk are characterised by inadequate housing, lack of services and infrastructure with high population growth and spatial expansion in dense, lower quality urban structures. Use of big data from within these low-quality urban settlement areas can be a useful step forward in generating information to have a better understanding of their vulnerabilities. Big data for resilience is a recent field of research which offers tremendous potential for increasing disaster resilience especially in the context of social resilience. This research focusses to unleash the unrealised opportunities of big data through the differential social and economic frames that can contribute towards better-targeted information generation in disaster management. The scoping study aims to contribute to the understanding of the potential of big data in developing particularly in low-income countries to empower the vulnerable population against natural hazards such as floods. Recognising the potential of providing real-time and long-term information for emergency management in flood-affected large urban settlements this research concentrates on flood hazard and use of remotely sensed data (NASA, TRMM, LANDSAT) as the big data source for quick disaster response (and recovery) in targeted areas. The research question for the scoping study is: Can big data source provide real-time and long-term information to improve emergency disaster management in urban settlements against floods in developing countries? Previous research has identified several potentials that big data has on faster response to the affected population but few attempts have been made to integrate the factors to develop an aggregated conceptual output. An international review of multi-discipline research, grey literature, grass-root projects, and emerging online social discourse will appraise the concepts and scope of big data to highlight the four objectives of the research and answer the specific questions around existing and future potentials of big data, operationalising and capacity building by agencies, risk associated and prospects of maximising impact. The research proposes a concept design for undertaking a thematic review of existing secondary data sources which will be used to provide a holistic picture of how big data can support in resilience through technological change within the specific scope of social and environmental contexts of developing countries. The implications of the study lie in the system integration and understanding of the socio-economics, political, legal and ethical contexts essential for investment decision making for

strategic impact and resilience-building in developing nations.