New data yields deeper understanding of poverty in India

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A new international study led by UvA researchers Peter Sloot and Michael Lees has yielded extensive data on slums in Bangalore and provides a detailed insight into the problem of poverty in India. The

highly granular data, which was collected through a field survey of 36 slums, could lead to a better understanding of poverty and to more effective strategies for managing and improving conditions for slum dwellers. The results were recently published in the journal *Nature Scientific Data*.

In 2010, an estimated 860 million people were believed to be living in slums worldwide. In order to formulate effective slum development programs and poverty alleviation methods, more insight is needed into the characteristics and needs of slum dwelling communities. As part of their study, the researchers collected data to gain a more complete picture of the problem and developed predictive computer models. 'Until now, the available data wasn't sufficient enough to build the advanced computer models needed to calculate intervention scenarios', says Sloot, who is professor of Computational Science and director of the UvA's Institute for Advanced Study.

Over the course of several years, the team conducted surveys and interviews in 36 slums across the city of Bangalore. The slums were chosen based on stratification criteria such as their location, population size, ethnicity and religious profile. By combining the fields of sociology, geography and computer science, the researchers studied the slums with geographical information systems and (agent-based) computer simulation. The collected data included approximately 267,894 data points spread over 242 questions for 1107 households. 'With this data we are able to develop high-resolution computational models to gain a new understanding about the evolution of slums in India.' says Michael Lees, assistant professor at the UvA's Computational Science Lab.

The research team has used the dataset to conduct further research into the structure and dynamics of slums. 'We have investigated group segregation and how it reinforces inequality within the slums of

Bangalore', adds Debraj Roy, a postdoctoral fellow closely involved in the project. 'Our results show that we might be able to increase the rate of successful interventions in slums if we target so-called horizontal inequality – which is inequality between, for example, Indian ethnic and religious groups.'

The research team has used the insights from the unique dataset to develop an agent-based model called DynaSlum to identify the key social determinants that impact the behaviour of a slum household. Over the next three years, the researchers will evaluate other, wider aspects like water infrastructure, water management and sanitation practices. The ultimate objective is to create a computer system that will calculate the effects of interventions and allow policymakers to assess different policy strategies before implementation.

  More information: Debraj Roy et al. Survey-based socio-economic data from slums in Bangalore, India, *Scientific Data* (2018). DOI: 10.1038/sdata.2017.200

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