



# Implementing baseline ecological and human health field assessments in the Revitalizing Informal Settlements and their Environments (RISE) programme in Makassar, Indonesia: an interdisciplinary study

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## Abstract

**Background** The Revitalizing Informal Settlements and their Environments (RISE) programme aims to assess the health, wellbeing, and ecological impacts of a water-sensitive-cities approach to improving urban informal settlements. Incorporating water-cycle management and green technology sanitation strategies, we aim to reduce flood risk and improve sanitation and waste water treatment leading to cleaner and healthier environments. Here we present the initial design pre-intervention for evaluation in the first 12 settlements in Makassar, Indonesia.

**Methods** Initial environmental, and wellbeing and human health assessments were implemented starting in October, 2018, in 12 settlements in Makassar, Indonesia. Ecological assessments include measuring of temperature and humidity via iButtons installed in select homes, recording of bio-acoustic to measure biodiversity within settlement boundaries, and trapping disease vectors quarterly. Implemented evaluation of environmental contamination includes sampling water and soil sources for total coliforms as well as collecting soil via bootsocks by walking predefined transects. Human assessment includes an annual baseline survey of all settlement households, assessing self-reported symptoms, health-care system utilisation, and subjective wellbeing. Additionally, children younger than 5 years are surveyed quarterly for caregiver reported symptoms of diarrhoea and febrile illness, blood samples and anthropometry are being collected annually, and faeces samples are requested quarterly.

**Findings** Ecological assessments have provided more than a million temperature data points. 21 000 mosquitos have been captured and identified. A total of 114 water samples, 84 bootsocks, and 91 soil samples have been collected, with sampling prior to and during the wet season. We have identified over 600 households within the 12 settlements. Health assessments of children under the age of 5 years have revealed 282 children with collection of 234 faeces samples and 188 blood samples.

**Interpretation** We have successfully implemented baseline ecological and human health and wellbeing assessment tools in all 12 settlements, which will allow for the evaluation of water-sensitive-cities approach in RISE programme.

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## Contributors

The analysis was conceived and designed by RRB, KSL, TW, MF, DR-L, SLC, SPL, DWJ, DR, DTM, PA, BC, AF, CG, JAS, JJO, AL, JO'T, SFB, PAF, GAD, GMF, RH, DJ, RS, and A. Programme management was done by MF, JW, A, SS, and R. JJO, AL, JO'T, SFB, PAF, GAD, GMF, RH, DJ, and RS and CG contributed data or analysis tools. PAF, GAD, GMF, DJ, RRT, MS, and AZ collected the data.

## Declaration of interests

We declare no competing interests.

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