Working with Communities: Integrated Urban Renewal in the Global South – RISE & CARP Project

Diego Ramirez-Lovering
Associate Dean International and Engagement &
Director of Informal Cities Lab Monash University, Australia
diego.ramirez@monash.edu

INTRODUCTION

The paper is a discussion about social innovation design driven projects in Indonesia done by the Informal Cities Lab (ICL): RISE (Revitalizing Informal Settlements and their Environments) and CARP (Citarum Action Research Program). Hence, it is delivered as a project paper.

Informal Cities Lab

The Informal Cities Lab (ICL) uses design and design thinking methodologies to forge sustainable urban development pathways for vulnerable communities and their environments. The ICL research group is particularly concerned with the rampant processes of urbanisation and environmental degradation that often comes with it.

We are interested in the intersection of built and natural environments and how to forge pathways that can deliver constructed habitats while supporting and enhancing the natural environment. In many countries in the Global South, the interface with water and waterways and the challenges of water supply, contaminated waters and disasters associated with water are of particular interest. However, it has become clear that to deliver effective and sustainable outcomes, projects have to be socio-technical in nature, that is, they need to address not only built and natural environmental challenges, but importantly social and economic imperatives.

Our vision is to help create communities and landscapes, that are clean, resilient and prosperous by developing community and ecosystem revitalisation pathways at the intersection of three domains -environment and climate change considerations, society and economy and technology and infrastructure, working toward developing one urban model that integrates social, economic and environmental aspects.

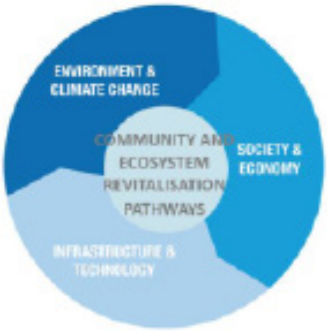

Image 1 Community & Ecosystem Revitalization Pathways. (Source: Ramirez-Lovering, 2022)

To deliver an integrated model combining social, economic, and environmental concerns we are working under the lens of two interdisciplinary frameworks:
1) Planetary Health- An emerging discipline which links the health of humans to the state of the natural systems on which humans depend- with the underlying principle that we must have a healthy environment for communities to be healthy. This is particularly evident now as we see the global devastation caused by the COVID pandemic.
2) The concept of Circular Economy- which aims to address global challenges of climate change, biodiversity loss and pollution, through minimising waste by creating closed-loop systems that among other things, and importantly, turns waste into resource.

PROJECT 1: RISE

RISE stands for Revitalizing Informal Settlements and Their Environments a large planetary health project, exploring novel revitalisation pathways for informal settlement communities. RISE is a transdisciplinary research program working at the intersection of health, environment and water and sanitation.

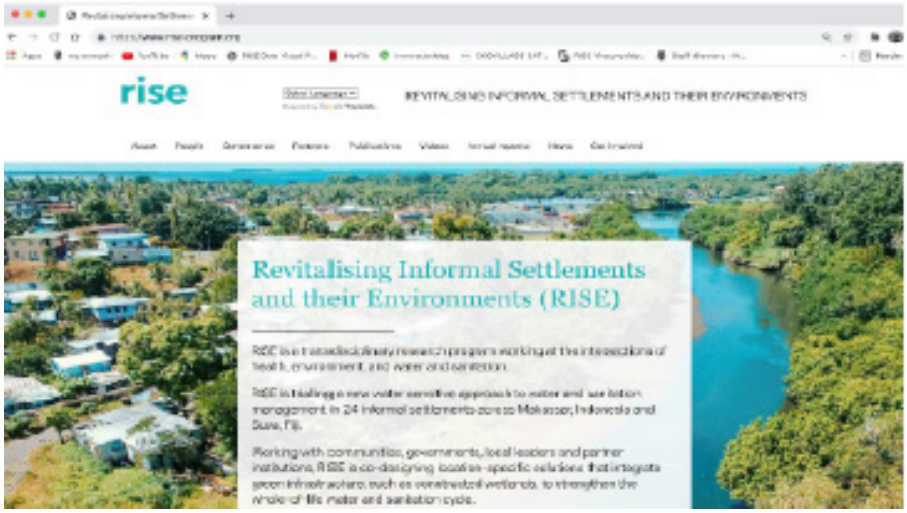

Image 2 RISE. (Source: RISE, Ramirez-Lovering, 2022)

The context of RISE is that in informal settlements of the global south: 1.7 billion people lack adequate housing, 2.3 billion people lack sanitation, over 580,000 children under 5 die of diarrhea each year. This number is likely to grow as informal settlements are predicted to double in number in the next 10-15 years. The significant problem lies in the cumulative effects of the water cycle as a critical factor aggravating the associated challenges of poor environmental quality and human health.

RISE Design Approach

RISE addresses these challenges by developing and implementing holistic, precinct-based interventions resulting in increased sanitation, improved flood protection, environmental stewardship, a sustainable water-supply, and greater resilience to effects of climate change in informal settlements. A large, randomized control trial, RISE aims to develop an evidence base for scaling up and inform the manner which global funders and implementers direct their efforts in informal settlement revitalization.

To address these compound challenges, we have developed a water sensitive design approach that aims to:

- Protect against floods
- Improve public health through the provision of sanitation
- Improve water and environmental quality
- Diversify water sources through rainwater and wastewater harvesting and reuse
- Service productive landscaped through these alternative water supplies

The approach has at its heart, context specific responses based on working with decentralised sanitation infrastructure known as green infrastructure, or nature-based systems. In this system a) we build new toilets, then, b) we connect the new toilets, or existing toilets if available to a reticulated local sewer network which we build, and c) we made the treatment train from toilet through the tank and then wetland treatment and safe discharge into the environment or for re-use for urban agriculture.

Image 3 RISE design approach. (Source: RISE, Ramirez-Lovering, 2022)

RISE are working in two countries. In the cities of Makassar, in Eastern Indonesia and in Suva, the capital of Fiji. In Makassar RISE working with 12 communities, approximately 600 houses, and 3500 people. These communities are very diverse and vary not only from country to country of course also vary within the same city. Not only do hygiene practices and bio-physical conditions of communities vary enormously but for delivering infrastructure, Land Tenure and land issues are very different. The communities in Makassar range from 20 to about 120 houses. With an average of 60 houses per community.

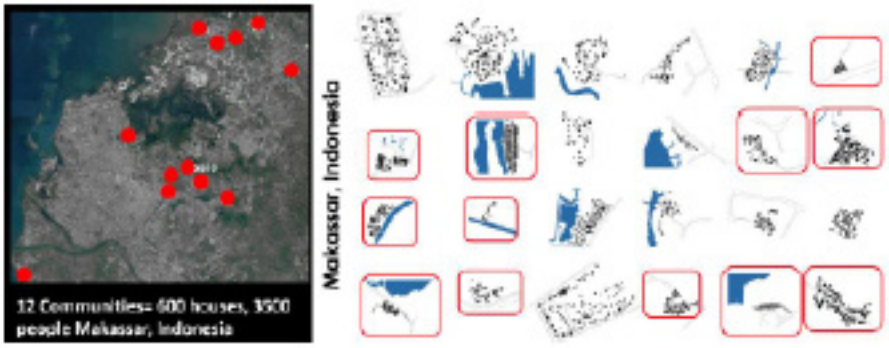

Image 4 The situation in Makassar. (Source: RISE, Ramirez-Lovering, 2022)

If contexts and problems affecting communities are so different, how can we deliver effective solutions that will address these differing challenges, be tailored to each biophysical and social situation to produce fit for purpose sustainable, outcomes?

Co-Design in RISE

RISE follow a process called co-design. Codesign is a participatory and inclusive process which involves all relevant stakeholders, especially community members,

in the planning, design, implementation, and operations and maintenance of RISE infrastructure. I'd like to show a short video which captures the essence of co-design in one of the communities in Indonesia. In Indonesia we call the co-design process PANRITA, which stands for "planning in your neighbourhood". In PANRITA we gather different community groups, women, men, youth, and children to learn about their community and develop the community designs together. The community designs are captured through community maps and models developed through a range of tools and activities that allow us to identify water related challenges and opportunities. Residents discuss and locate challenges and opportunities with the environment and with their own houses to inform different infrastructure solutions. With this information, community and team members design the infrastructure system in the right arrangement and in the right location in the settlement.

Image 5 Co-Design in RISE. (Source: RISE, Ramirez-Lovering, 2022)

The outcomes of these activities and processes are recorded in the community model, which becomes a complex register of environmental conditions and contamination pathways, private and public land boundaries, and importantly, the locations for the infrastructure.

Image 6 Community Model. (Source: RISE, Ramirez-Lovering, 2022)

The model outcomes are then transcribed onto what we call the community map, that can be seen below:

Image 7 Developed Community Map. (Source: RISE, Ramirez-Lovering, 2022)

The map serves not only as a formalisation of the co-designed solutions, but as a process of identifying the different roles and responsibilities for project delivery. Please note, the pink notes are the elements that were identified as being the responsibility of the RISE Program, the yellow notes are the elements that were identified as being the responsibility of the Government, and the blue notes are the elements that were identified as being the responsibility of the Community.

RISE PILOT PROJECT

An important aspect of the project has been to deliver a demonstration project in each city. We have delivered a demonstration project in Makassar to test and tailor the co-design process as well as the key green technologies for local conditions. In Makassar, the demonstration project is delivered in a relatively new settlement which contains 22 private lots with 11 houses built and another 11 to come. The community suffers from severe contamination which is exacerbated by extreme floods during the monsoon season. During this period the community uses a makeshift raft and a bamboo bridge to travel from their houses to the main road.

Image 8 The situation in Makassar settlement where the pilot project is done. (Source: RISE, Ramirez-Lovering, 2022)

Through the co-design process, we developed a proposal which was delivered in two stages. Stage one in yellow includes the rise infrastructure of new toilets and rainwater tanks, an elevated road as a type of service spine containing the communal septic tanks subsurface and surface wetlands. Stage 2 in purple will be delivered by municipal government including streetlighting, benches and new trees for the community.

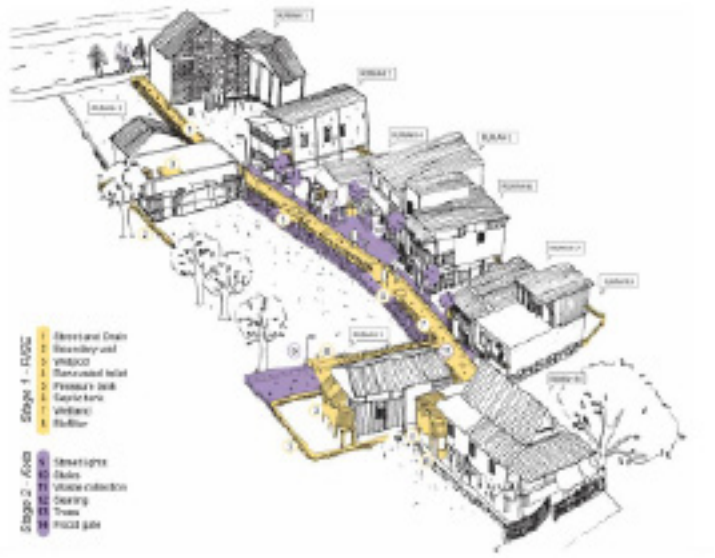

Image 9 The RISE pilot project design schemes. (Source: RISE, Ramirez-Lovering, 2022)

Here is the documentation of the finished design intervention:

Image 10 The RISE pilot project. (Source: RISE, Ramirez-Lovering, 2022)

Interestingly, an economic analysis of the demonstration site shows that while the per household cost of the RISE water sensitive intervention is similar to the cost per household of a centralised, trunk sewerage system, the RISE approach provides significant additional co-benefits such as safe access, a new water supply and flood protection.

PROJECT 2: CARP

Citarum Action Research program (CARP) is partnering with the West Java Government and the International Researcher community to address the issues of contamination and environmental degradation of the Citarum river, Indonesia. CARP takes the learning from the RISE water sensitive upgrading of informal settlements approach and extends it through concepts of circular economy, where sources of waste are converted into resource, and whole of catchment thinking, which takes into consideration the wider catchment hydrology outside the local project area.

Image 11 The CARP as an extended RISE project. (Source: CARP, Ramirez-Lovering, 2022)

The Citarum River is the longest and largest river in West Java, Indonesia and, provides water and electricity for over 25 million people. However, It is also one of the most polluted rivers in the world. Each day 20,000 tons of waste and 340,000 tons of wastewater are disposed directly into the river. As waste is discharged into the river that supplies water, food and livelihoods, communities become increasingly vulnerable to flooding and ill-health.

The Government of West Java, in response to a presidential decree has embarked on an ambitious revitalization program lead by the Citarum Task Force. While some progress has been made, the Government is seeking new approaches to accelerate the transformation of the Citarum River. At the end of 2018 the ICL were invited by the Governor of West Java, Ridwan Kamil to join in the river revitalisation efforts, to assist with research and development efforts toward improving the river and its vulnerable communities.

STEP 1 – A Village Demonstration in the Citarik Ekowisata

Our river revitalization road map begins with a demonstration and living laboratory project in the Citarik river, where we are joining forces with central, provincial and local Government in a project called the Ekowisata. Here, we also used Co-design approach and test innovations through the development of an integrated water and waste model to generate evidence for river health, circular economy transformations, Capacity building and behavior change.

Image 12 The CARP Citarik River Revitalization Plan. (Source: CARP, Ramirez-Lovering, 2022)

The Citarik Ekowisata site, in the peri urban edge of the city of Bandung, spans over 2.5 kilometers and has over 1200 houses, schools, agriculture, and livestock. It faces a range of significant wastewater and solid waste challenges, as well as flooding and drought. It is a good representative case of the broader challenges faced by the broader Citarum river basin.

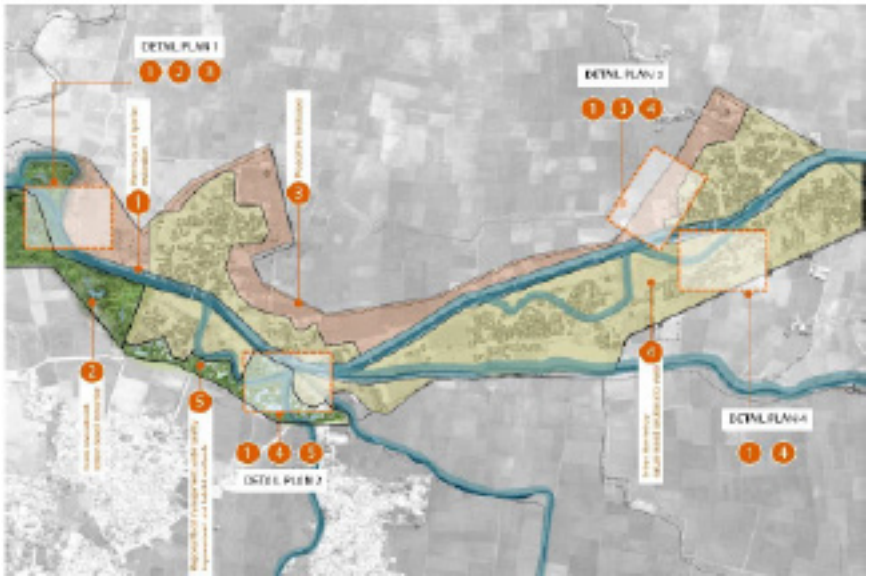

Image 13 The Citarik River Revitalization Detailed Plan. (Source: CARP, Ramirez-Lovering, 2022)

Five Objectives for Citarik River Revitalization as part of CARP

We are co-developing, with government and community stakeholders a revitalisation framework which will guide project development, and up-scaling strategies. Here, below the revitalization framework, which is based on five key objectives:

1) Waterway restoration – The waterway and riparian corridor rehabilitations strategy focuses on mitigating site based and sub-catchment-based sources of

pollution and environmental degradation while maintaining the hydraulic capacity for floodwater conveyance. We will restore aquatic habitats through control of flow velocity, geomorphic form of the waterway, stream bank stabilisation and reinstating Oxbow lake environments through rehabilitation of ecological habitat.

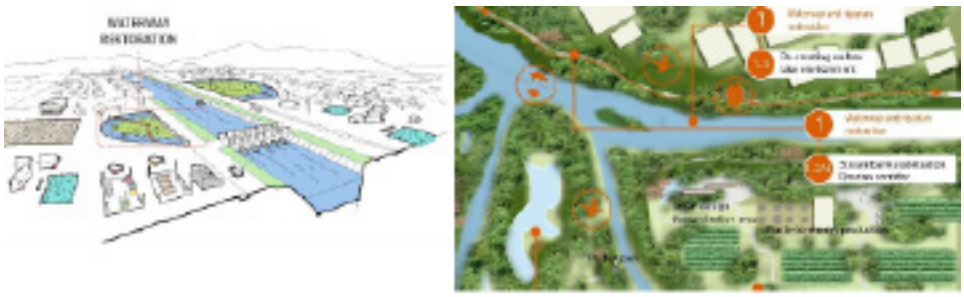

Image 14 1st Objective: Waterway restoration. (Source: CARP, Ramirez-Lovering, 2022)

2) Water and sanitation services – where nature based, green infrastructure is used to clean wastewater from households, village industry and livestock. The strategy looks at using water sensitive urban design through the incorporation of biomimicry in embedding nature-based solutions into urban environments in the surrounding villages for sanitation services, stormwater quality improvement and land and water pollution control.

Image 15 2nd Objective: Water and sanitation services. (Source: CARP, Ramirez-Lovering, 2022)

3) Solid waste services – where we will use grey and smart solutions for recovering waste at source and in river, waste separation and connecting to circular waste utilization services: Establishing in stream solid waste recovery through Garbage traps, and Household, small business waste collection and separation of organic and inorganic waste such as plastic and glass, and waste sorting systems at precinct scale.

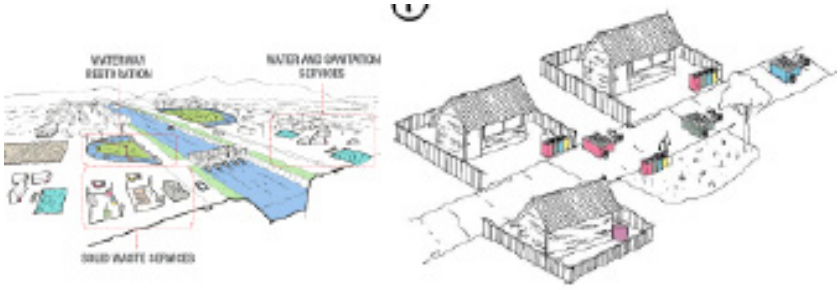

Image 16 3rd Objective: Solid waste services. (Source: CARP, Ramirez-Lovering, 2022)

4) Micro-economy promotion – using Circular economy solutions for green products, services, water and energy to enhance community economic outcomes. Small business ventures through the recycling of plastic and glass waste into products and energy as well as organic waste with black soldier fly farms and the sale of black soldier fly larva products, including livestock feed and aquaculture feed and through agriculture support products such as fertilizer into waste and resource loops that support local food production and the local economy.

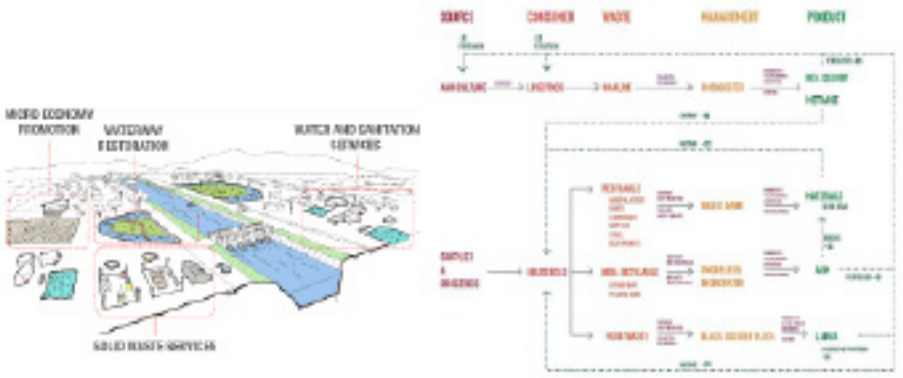

Image 17 4th Objective: Micro-economy promotion. (Source: CARP, Ramirez-Lovering, 2022)

5) Climate change adaptation – includes a regional flood management strategy through the creation of regional wetlands for flood mitigation and detention as well as the reinstatement of threatened habitats for flora and fauna.

Image 18 5th Objective: Climate Change adaptation. (Source: CARP, Ramirez-Lovering, 2022)

STEP 2 – Generate Evidence for Scaling

The demonstration project will inform a spatial analysis of land use practices leading to river pollution and an investigation into the Social and economic enablers and barriers to river transformation (culture, poverty, gender, local governance) to inform strategies for upscaling.

Image 19 Step 2 of The River Revitalization Roadmap. (Source: CARP, Ramirez-Lovering, 2022)

STEP 3 – Develop Capacity for River Revitalization and Circular Economy

The final step will look at the development of these upscaling strategies through the creation of Tools and guidelines for local solutions, River resilience monitoring, evaluation and reporting programs, Training and skills development programs which aim to inform Policy & governance for basin transformation. We aim for the evidence generated to inform and support current and pipeline Government infrastructure and community development to sustainably restore the river over the next 20 years.

Image 20 Step 3 of The River Revitalization Roadmap. (Source: CARP, Ramirez-Lovering, 2022)

END NOTE: TRANSDISCIPLINARY IMPACT RESEARCH

The RISE and CARP projects present a new direction in what we call transdisciplinary impact research - On the one hand there is an agenda for direct and tangible on the ground change and impact for these vulnerable communities. On the other the aim of establishing a long-term cross-sectoral platforms and consortia with a wide range of partners to sustainably embed the enabling conditions that will ensure enduring revitalization approaches.

Image 21 Transdisciplinary Impact Research. (Source: CARP, Ramirez-Lovering, 2022)