

AKPIA TRAVEL GRANT REPORT

PREPARED FOR:	AGA KHAN PROGRAM IN ISLAMIC ARCHITECTURE, MIT
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PROJECT:	CITY DEVELOPMENT STRATEGIES: MAKING URBAN INVESTMENT WORK
PROJECT LOCATION:	SOLO, BANJARMASIN, AND PEKALONGAN, INDONESIA
PARTNER NGO:	SOLO KOTA KITA,
NGO LOCATION:	SURAKARTA (SOLO), INDONESIA
DATE:	SUNDAY, MAY 20, 2012

About Solo Kota Kita

Solo Kota Kita is a non-profit organization based in New York and Jakarta that creates development and design projects throughout the world. Their approach is highly inclusive of the communities where they work and they believe in helping citizens and officials alike understand the complexities of the built environment so they can better take on the problems and opportunities that come with rampant urbanization. Their work has ranged from neighborhood-based data collection to city visioning consultation to urban design development. We are excited to work collaboratively with SKK and pair our design expertise and their local knowledge.

Project Summary

Last summer, I embarked on my first trip to Indonesia with fellow classmate Alice Shay, where we worked with the organization Solo Kota Kita (“Our City Solo” in Bahasa, or SKK for short). We implemented a project for UN-Habitat, sponsored by the Cities Alliance, called “City Development Strategies: Making Urban Investment Work” that involved field work in the Indonesia cities of Banjarmasin, Pekalongan, and Surakarta (Solo). The project was prepared with technical and financial assistance of UN-HABITAT Regional Office for Asia and the Pacific, and financial assistance provided by Cities Alliance Trust Fund.

The primary purpose of the project was to create city profiles to be used as facilitation documents for neighborhood-level planning and participatory budgeting in the fall of 2011. The profiles provide each local community with a range of images, maps, and analyses of urban issues related to development, environment, poverty, and local governance.

Between 2011 and 2012, this CDS program is working in three Indonesian cities: Banjarmasin, Pekalongan and Solo. These three cities were chosen to pilot the initiative since they have been widely recognized as having good governance, strong local leadership, inclusive policies that target the poor, and dynamic ideas to foster growth. As “champion” cities they can serve as good examples for Indonesia’s nearly 500 cities, demonstrating how strong leadership and vision are essential to fostering comprehensive, inclusive, and credible strategies. These are the key elements required by central government in order to support the implementation of the national urban investment programme: the “Mid-Term Investment Programme” (Rencana Program Investasi Jangka Menengah) (RPIJM).

“Making Urban Investment Planning Work” focuses on medium-term investments. Medium-term investments are doable, but also “change-making” projects that can have an impact on the city as a whole and serve as building blocks that lead to the realization of the city’s larger development vision. These projects are not too small that they have little impact beyond the neighborhood level, nor too big that they may take many years to implement. By linking these kinds of projects to financing allows cities to comprehensively implement their strategies, and in doing so fully realize their goals.

We conducted interviews, compiled field observations, and using data to create these profiles. The core of the project was working with an interdisciplinary team to interpret and communicate urban patterns and potential futures in these three cities in a way that is user-friendly for government officials and the wider public alike.

I was excited to work in a context of capacity building through this project. Our team brought a particular set of skills to the table, but also focused on enabling local community members to leverage their personal understanding of their community and improve their own skill sets. My personal draw to this project was in leveraging design primarily as a means for visualizing typically dense information about urban conditions. I believe that visualization is integral to making information more accessible and to increasing capacity for communities to engage in the processes shaping their environments.

To kick off the project, Alice and I spent a week at Metropolitan Exchange, an architecture, urban planning, and research cooperative located in downtown Brooklyn, New York. Michael Haggerty, one of our project supervisors, led us on a crash course of Solo. We looked at the data and analysis developed by SKK last year, sketched new map overlays, and discussed our initial thoughts on development in this mid-sized city in Central Java.

A Portrait of Production in Solo, Indonesia

Throughout Solo, Indonesia, countless cottage industries cluster in distinctive neighborhoods to share resources and techniques. Because the city lacks the accessible natural resources on which many mid-sized Indonesian cities subsist (let's save a discussion on palm oil production in Kalimantan for another day), small-scale production is integral to Solo's local economy. The city has taken measures to ensure support for this scale of industry by actively limiting the development of malls and chain retailers and upgrading the traditional markets where these goods are sold.

Unlike the mega-factories of mass produced goods, places of production for hand-made goods also happen to be people's homes. On an afternoon stroll (known colloquially as *jalan jalan*), you can stumble through the borough of birdcage makers, the *blangkon* quarter, and the stomping grounds of the shuttlecock crafters. Of key civic importance are the batik neighborhoods, which historically supplied the royal family with the highest quality of traditional Indonesian cloth.

The Solo Kota Kita (SKK) team visited several of these neighborhoods and met the people who make these products by hand. We learned quickly that the friendliness of Solo's citizenry is surpassed only by their adeptness, ingenuity, and skill.

Teamwork & Entrepreneurship

Stephen and Alice have collaborated together on a range of urban design and planning projects during their time at MIT, honing their capacity to innovate together and as individuals supporting one another. Our work has spanned from urban design studios to fieldwork in New Orleans to last summer's internship to the international competition in London. Implementing the Firm Foundation project would be an incredible next step for the collaboration we have been able to develop during our time in DUSP.

In addition to teamwork between MIT colleagues, this project is particularly exciting because it presents an opportunity for collaboration between a wide range of individuals with diverse expertise. Firm Foundation collaborators include NGO founders, undergraduate architecture students, local activists and government officials. The UrbanSOS competition has already aided our Indonesian teammates to further their architecture practice beyond their home city. The project has also enabled Solo Kota Kita to take a step forward with its practice toward physical design, including a close engagement with local leaders. We are excited by the multiplier effect this project has already had for those involved and look forward to the next phases and seeing what the Firm Foundation collaboration will enable.

From June through August of 2011, we implemented a project for UN-Habitat Indonesia called “City Development Strategies: Making Urban Investment Work.” The project involved fieldwork in and travel to the Indonesian cities of Banjarmasin, Pekalongan, and Surakarta (Solo).

The primary purpose of the project was to create three city profiles to be used as facilitation documents for neighborhood-level planning and participatory budgeting. The profiles provide a range of visual documentation, mapping, and analysis of urban issues related to development, environment, poverty, and local governance through the use of data, interviews, and field observation. We worked with an interdisciplinary team to interpret and communicate urban patterns and potential futures in these three cities in a way that is user-friendly for government officials and the wider public alike.

Through this process, we were struck by the riverfront housing conditions of the city of Banjarmasin. The city sits at the southern tip of Borneo, where the Barito river empties into the Java Sea. It is the self-proclaimed City of 1000 Rivers. Although the actual number of rivers falls short of the thousand declared, it quickly becomes clear just how integral the river system is to the daily life of its citizens. More than 150 km of rivers, canals, and tributaries course through the city. The water is used daily for transport, cleaning, bathing, trade, recreation, production, and fishing.

Banjarmasin is currently undergoing many large-scale physical, economic and environmental transformations. Declining industrial production has left behind a legacy of contamination and ecological damage on the river’s edge. Banjarmasin is growing but the city cannot keep up with this urbanization. Many communities live without utilities and basic infrastructure. The city’s tidal levels are rapidly rising due to climate change. Residents battle with the waters everyday to maintain their wood-built homes and livelihoods.

In response to these conditions, the city is attempting to address the issues of its riverfront communities by removing slums and relocating residents to high rise apartment buildings far inland. While this solution may reduce physical vulnerability of riverfront living, it drastically alters lifestyle and dislocates residents from the river system, integral to their cottage industries, transportation, and accessibility to resources. We recognized an opportunity to develop another option for riverfront development in the city. In partnership with two local undergraduate architecture students, Bima Putra and Addina Amalia of the Universitas Sebelas Maret, we designed a system of gabion foundations that mitigate the vulnerabilities of riverfront housing by,

- providing physical stability as platforms for waterfront activities, housing, and intermodal (water-to-land-based) transportation;
- improving public health as conduit for access to municipal utilities (household water, sanitation, electricity);
- and refortifying ecology by protecting the riverfront from further erosion and reestablishing waterfront vegetation.

At the end of the summer, we submitted the proposal to the UrbanSOS student design competition. The annual competition was created by AECOM to engage students in the fields of urban planning, design, architecture, landscape architecture, and engineering with the issues confronting modern cities and to foster a cross-disciplinary approach to the complex challenges facing today’s built and natural environments. This year’s competition focused on the theme of Water, noting that it is “the world’s most vital resource, is central to every aspect of city life: from basic human sustenance and public health to environmental remediation and overall urban renewal.”

In September, we were notified as one of three finalist teams out of nearly 200 entries. We refined our proposal and traveled to London in November to compete and win the global competition and secure seed funding to implement the project with our partner organization, SKK. We are extremely excited about the opportunity to implement a physical design, a rare occurrence for

planning and architecture students, and believe that the initiative is reflective of the humanitarian and entrepreneurial spirit. The team is planning to reconvene in Indonesia come August of 2012 to implement the 'Community Design Competition' phase of Firm Foundation, as outlined in the following proposal summary.

Instead of proposing a complex, avant-garde architecture intervention, we hope to optimize the infrastructure, housing and ecological systems that already exist in these communities. Critically re-examining the systems at hand and simplifying them for increased effectiveness through a straightforward new intervention--the gabion foundations. We also plan to implement our project in collaboration with local residents so learnings will carry forward into continued stewardship and sustained neighborhood improvements. Firm Foundation hopes to bring positive change to Banjarmasin with an unconventional yet pragmatic project.



THE FIRM FOUNDATION TEAM DURING THE URBANSOS COMPETITION IN LONDON, WITH JASON PRIOR, CHIEF EXECUTIVE OF PLANNING, DESIGN + DEVELOPMENT AT AECOM.



**CONTINUING WORK:
FIRM FOUNDATION**

Firm Foundation reduces physical vulnerability and enables endogenous development of the urban riverfront communities with a flexible kit of parts of gabion foundations. The project engages communities towards stewardship of their neighborhoods and waterways with a participatory design process.

To mitigate physical vulnerabilities of riverfront housing, we developed a simple structural system of gabions to increase resiliency. The gabions extend perpendicular to the shoreline in the spaces between groups of homes. Functionally, they reinforce the stability of housing, create new pathways, and enable the construction of platforms for waterfront activities. The gabions lay the groundwork for the Firm Foundation kit of parts. We have identified a set of already-in-use government-supported and informal infrastructures that can be easily incorporated into the gabions.

Firm Foundation can be flexibly scaled and accommodate a variety of programs. The specific components applied to each instance of the Firm Foundation system will depend on local need and site context identified through the Competition as Campaign participatory planning process.

The implementation plan for Firm Foundation follows four phases:

1. Outreach
2. Competition as Campaign
3. Design & Engineering
4. Implementation

The Competition as Campaign proposes that the fieldwork and design of the Firm Foundation be completed by neighborhood residents themselves with support from Solo Kota Kita, design experts and local government. We believe that self-reliant urban design must be participatory from the initial research phases. This collaborative process ensures implementation achieves local need and increases capacity for future stewardship. Through close collaboration with an RT (neighborhood association) and residents, we plan to organize a design competition with the output as the initial design proposal for the first application of the Firm Foundation system. The competition process leverages a recently-popular method towards community engagement to increase awareness of urban water issues in Banjarmasin. The objective for Firm Foundation is to increase systemic resiliency in Banjarmasin through a participatory urban design solution.



Project Context

Banjarmasin's river system is both an asset and a vulnerability for the city's urban poor—central to the city's identity and the cause of people's daily troubles. The rivers are integral to the Banjari way of life but the condition of the waters hurts people's livelihoods and well-being.

PUBLIC HEALTH:

While residents' daily lives are tied to the river, its conditions are detrimental to their health and well-being. The river is polluted from industrial waste, ecological imbalance and a lack of adequate public utilities. Residents must use this harmful water for daily activities.

PEOPLE'S LIVELIHOODS REVOLVE AROUND THE RIVER:

Selling goods from small boats to the riverfront communities, operating a riverfront warung, floating markets where vendors distribute foodstuffs and running riverboats as informal public transit. Simultaneously, the waterfront usage is impaired by the damaged ecology and degraded physical environment.

BANJARIS IDENTIFY STRONGLY WITH THEIR WATERWAYS:

The rivers are more than just another layer of the city's infrastructure, they are the backbone of cultural life in Banjarmasin. The water is integral to the Banjarmasin way of life. Our project proposes a solution to revitalize the waterways while maintaining waterfront communities' access to the river. Firm Foundation provides a stable ground for the urban poor in Banjarmasin, reinforcing the livelihoods and cultural identity of the riverfront communities.

PEOPLE & WATERWAYS

72,745

SLUM HOUSING UNITS
ARE WITHIN 200 M
OF WATERWAYS.

82%

OF RESIDENTIAL AREA IS
WITHIN A 5 MINUTE WALK
(400 M) OF WATERWAYS.

84%

OF THE CITY'S TOTAL AREA
IS WITHIN 400 METERS OF
WATERWAYS.

POPULATION

720,000

BY 2030, THE CITY IS EXPECTED TO NEARLY DOUBLE IN
POPULATION TO OVER A MILLION, CAUSING EXTREME
DISTRESS ON THE CAPACITY OF THE CITY'S RESOURCES,
HOUSING, AND INFRASTRUCTURE.

9681.29 ha

BANJARMASIN, THE CAPITAL OF SOUTH
KALIMANTAN, WAS FOUNDED IN 1526 FOR ITS
PRIME RIVER TRADE LOCATION. THE CITY IS
EXISTS ON A DELTA ISLAND.

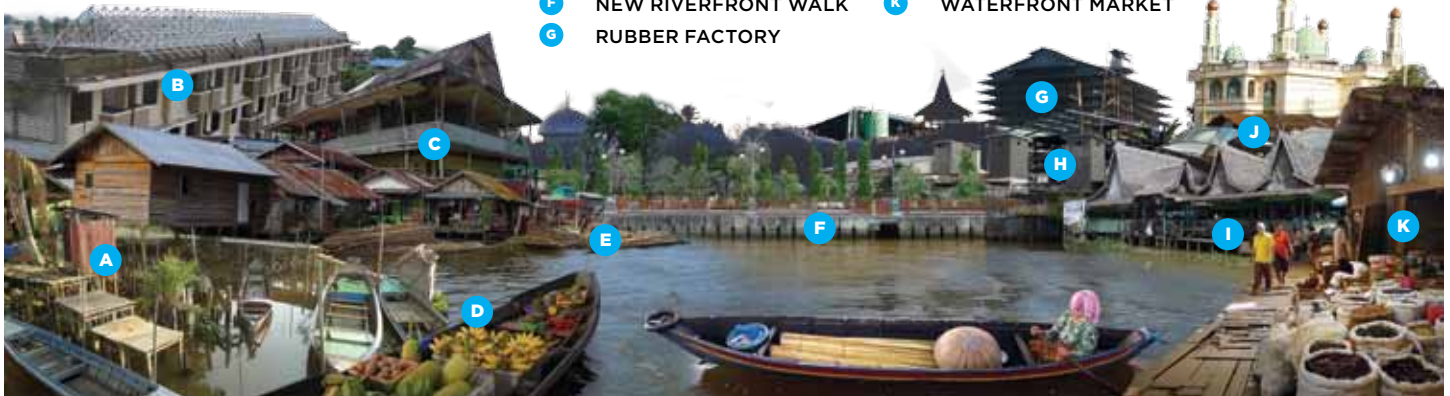
74.37 PERSONS
/ HECTARE

THE CITY IS HOME TO SOME OF THE DENSEST
URBAN SLUMS IN SOUTHEAST ASIA. RIVERFRONT
SLUM AREAS ARE AMONGST THE MOST RAPIDLY
DENSIFYING AREAS.

- A SLUM HOUSING
- B PUBLIC HOUSING

- C DUTCH ARCHITECTURE
- D TRANSIT & TRADE BOATS
- E LUMBER INDUSTRY
- F NEW RIVERFRONT WALK
- G RUBBER FACTORY

- H BIRD'S NEST HARVESTING
- I WATERFRONT RESTAURANT
- J MOSQUE
- K WATERFRONT MARKET



Key Physical Vulnerabilities – Case for Implementation

We spent five days exploring the waters of Banjarmasin as fieldwork for our summer internship and as background research for the UrbanSOS project. We had the unique opportunity to meet people who live on the waterfront and learn what it's like to live in a city of rivers. During our conversations with residents and local officials, we gained an understanding of the structural and environmental issues along the water in Banjarmasin.

We made a video of these conversations and visits to the river, which can be seen on this website:
[HTTP://FIRMFUNDATION.TUMBLR.COM/](http://firmfoundation.tumblr.com/)

UNSTABLE BUILDING CONSTRUCTION

The urban poor are skillful at building homes over the water. However, homes are vulnerable due to the lack of high-quality materials or infrastructure and the constant need to raise homes because of flooding. During the dry season, fires ravage the wooden structures.

WATER QUALITY: TRASH & POLLUTION

The rivers have been contaminated by industrial pollution, build-up of urban waste and the elimination of a healthy river ecology. Industry and households produce waste at a rate of 300 tons/day. However, the city only has the garbage management capacity to bring to the landfill 180 tons/day. Where does the rest go? The water.

SANITATION & PUBLIC HEALTH

The urban poor are surrounded by rivers but lack access to potable water. Recent public health outbreaks of E. coli and cholera are caused by water-borne bacteria. The city has no comprehensive utility system to reach the riverfront urban poor.

EROSION & SEDIMENTATION

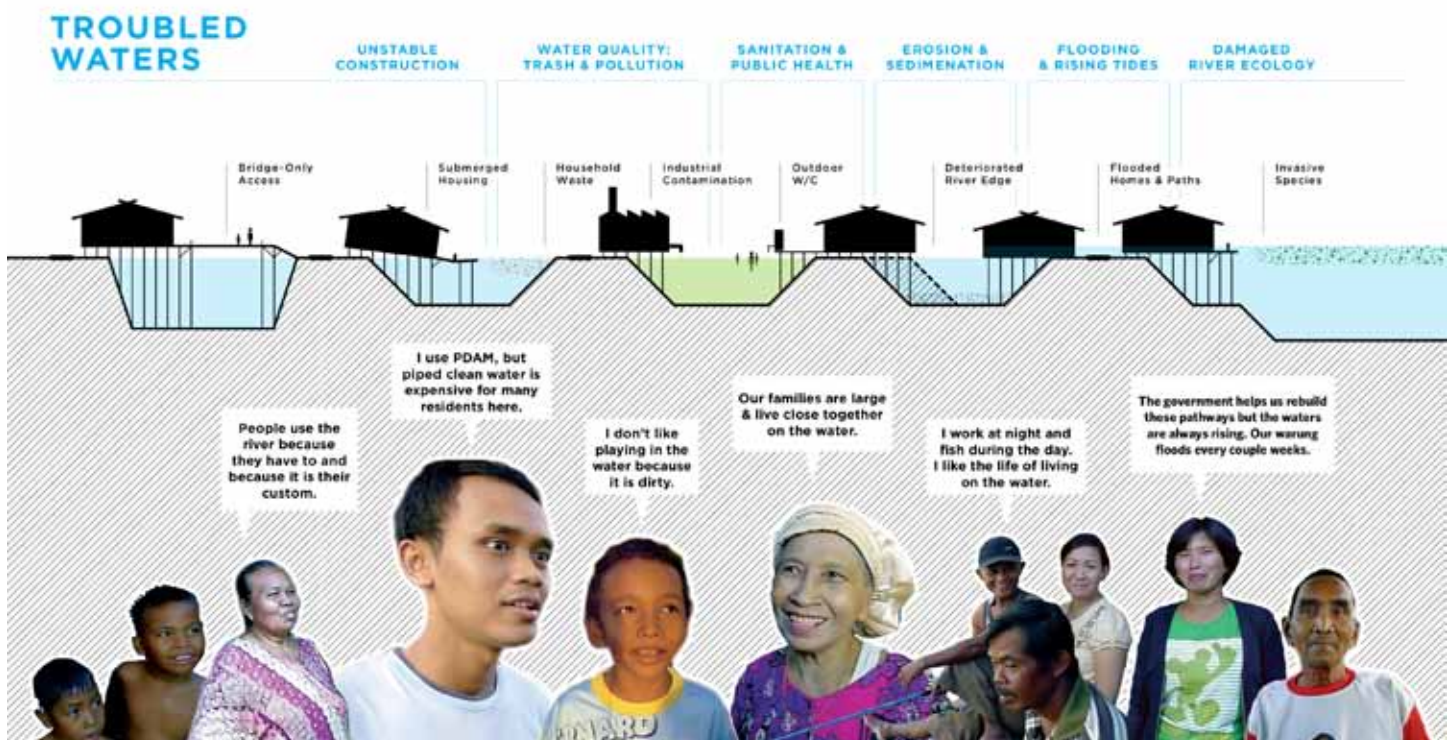
The river embankments have eroded, increasing the number of homes over the water. At the same time, the number of rivers has decreased from 72 to 61 in the last 5 years due to sedimentation and build-up of urban wastes. Channelization disrupts the rivers' natural self-regulation.

FLOODING & RISING TIDES

Climate change and sedimentation have caused rising water levels across the city. During the rainy season, the city's estuaries, canals and municipal drainage are overloaded, flooding entire neighborhoods. The lack of adequate drainage infrastructure exacerbates public health issues and degrades built structures.

DAMAGED RIVER ECOLOGY

Water hyacinth has taken over the waterways. The plant, which thrives in polluted water bodies because it has a high capacity for the uptake of heavy metals, will starve the water of oxygen and kill fish populations. However, hyacinth can be used to remediate contaminated water and harvested as a valuable ingredient for fertilizer.



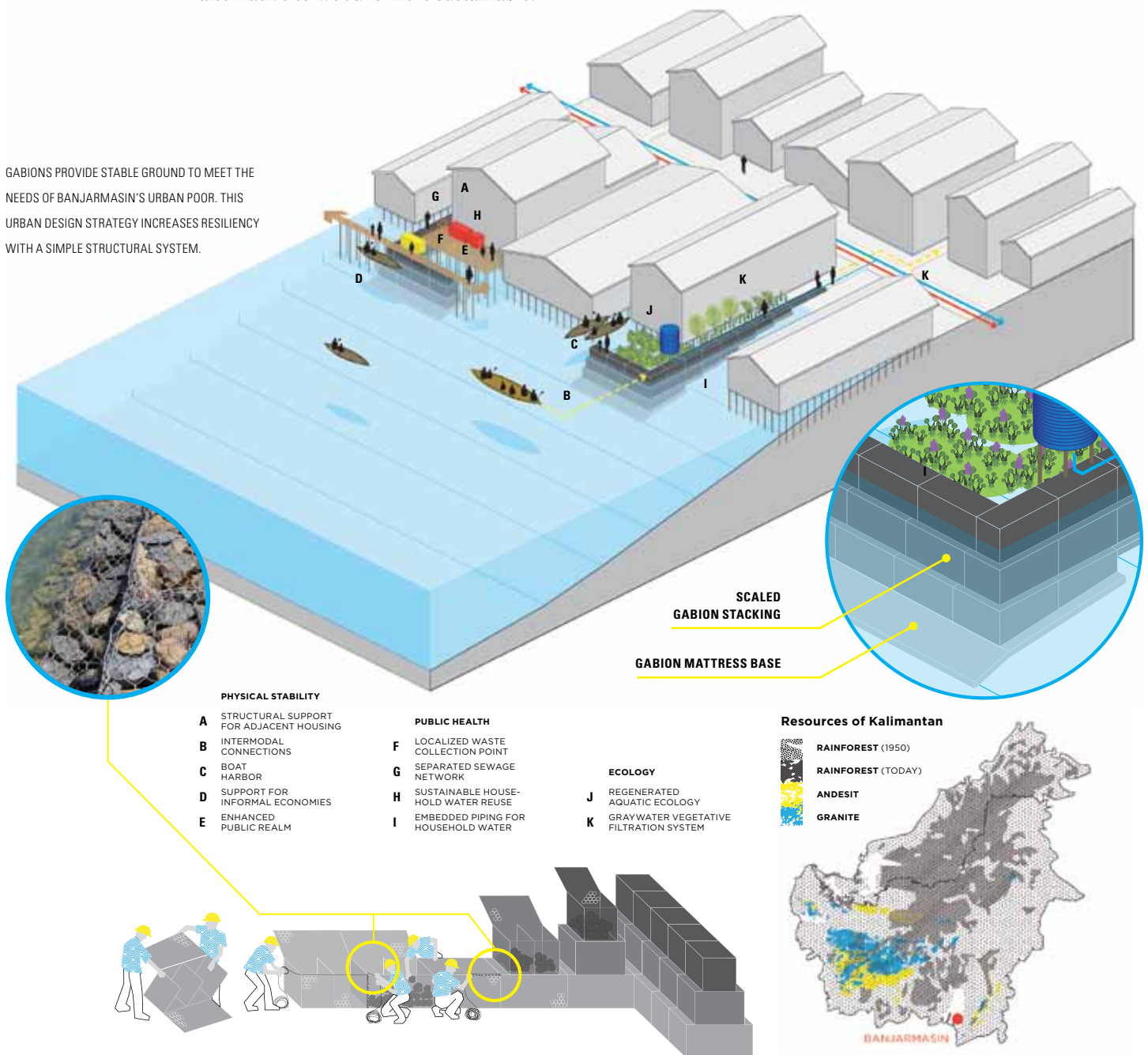
Project Description

Firm Foundation reduces physical vulnerability and enables endogenous development of the urban riverfront communities with a flexible kit of parts of gabion foundations. The project engages communities towards stewardship of their neighborhoods and waterways with a participatory design process.

To mitigate physical vulnerabilities, we came up with a simple structural system of gabions to increase resiliency. The gabions extend perpendicular to the shoreline in the spaces between groups of homes. Functionally, they reinforce the stability of housing, create new pathways, and enable the construction of platforms for waterfront activities.

Gabions are a landscape device that can be easily constructed without the use of heavy machinery by community members themselves. Gabions arrive on site partially assembled in flat pack format with lacing wire and locking pins for permanent connections. Local materials can be used to construct the gabions. Stone is a particularly enticing material option. Kalimantan's rainforest lumber resources are nearly depleted. An alternative to wood is more sustainable.

GABIONS PROVIDE STABLE GROUND TO MEET THE NEEDS OF BANJARMASIN'S URBAN POOR. THIS URBAN DESIGN STRATEGY INCREASES RESILIENCY WITH A SIMPLE STRUCTURAL SYSTEM.



CONTINUING WORK: FIRM FOUNDATION

The gabions lay the groundwork for the Firm Foundation kit of parts. We have identified a set of already-in-use government-supported and informal infrastructures that can be easily incorporated into the gabions. Our project will work with neighborhood residents to develop physical improvements in their communities with a “kit of parts” that will include household water reuse infrastructure, landscape-based wastewater treatment systems, the restoration of the river edge, and other design-based strategies. Together these improvements will reduce water-related vulnerability as well as the impact of urban activity on the river ecology, improve the public realm, and reposition the river as a local asset.

The potential range of components for the kit of parts includes:

- STRUCTURAL SUPPORT FOR ADJACENT HOUSING
- LOCALIZED WASTE COLLECTION POINT
- SUSTAINABLE HOUSEHOLD WATER REUSE
- SEPARATED SEWAGE NETWORK
- EMBEDDED PIPING FOR HOUSEHOLD WATER
- SUPPORT FOR INFORMAL ECONOMIES
- INTERMODAL CONNECTIONS
- ENHANCED PUBLIC REALM
- BOAT HARBOR
- REGENERATED AQUATIC ECOLOGY
- GRAYWATER VEGETATIVE FILTRATION SYSTEM

Firm Foundation can be flexibly scaled and accommodate a variety of programs. The specific components applied to each instance of the Firm Foundation system will depend on local need and site context identified through the Competition as Campaign participatory planning process.

The strength of the Firm Foundation design is that both the gabions and the kit of parts are based on pre-existing systems. The combination of the two achieves a more formalized adaptation to the riverfront housing, leveraging local knowledge with sustainable urban design tactics.

Kit of Parts



Versatility in Application



Implementation

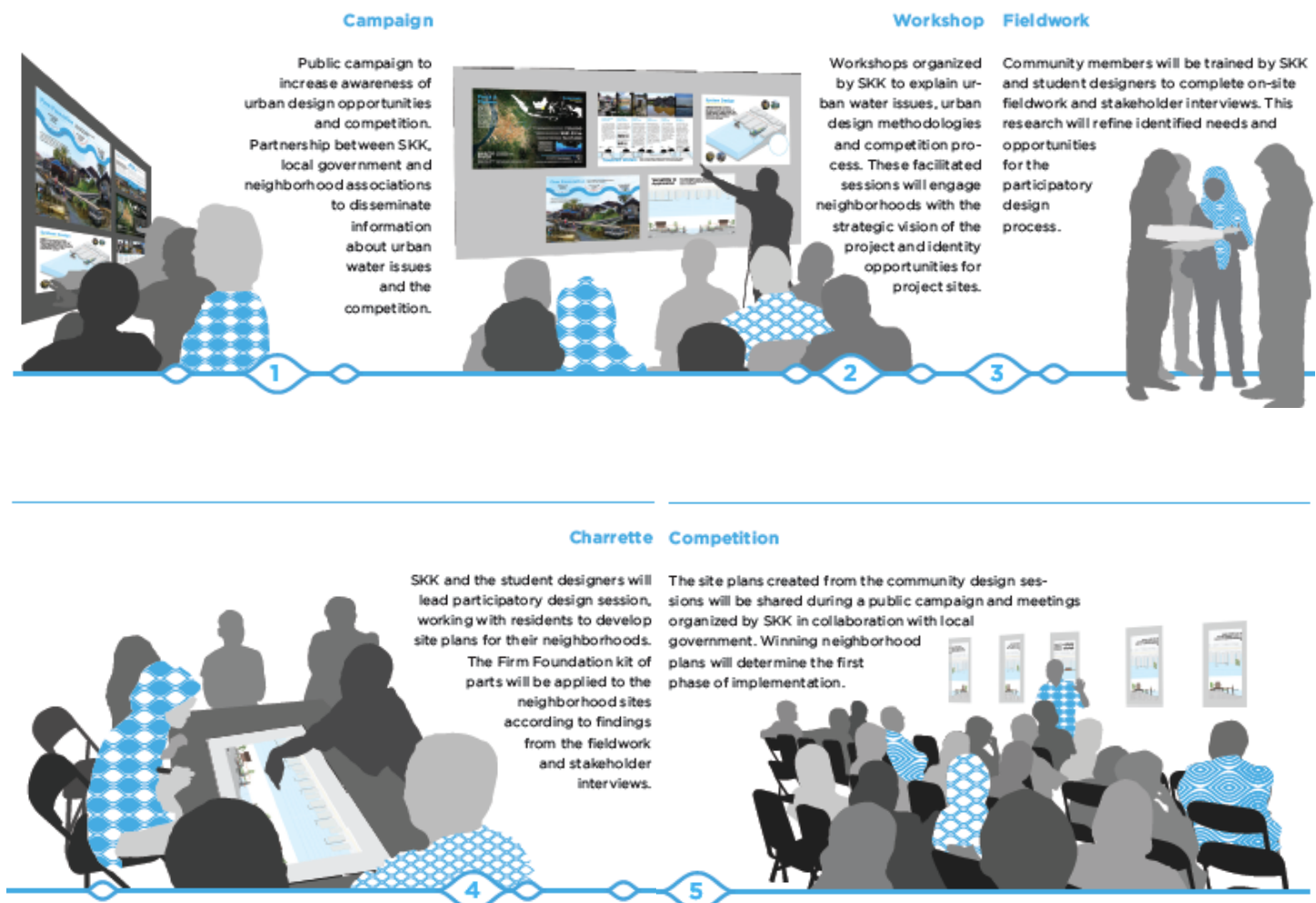
The implementation plan for Firm Foundation follows four phases: 1) Outreach, 2) Competition as Campaign, 3) Design & Engineering, and 4) Implementation. We are applying for funding to support the Competition as Campaign phase, which will be executed during the summer of 2012.

The Competition as Campaign will begin with a public campaign and series of workshops run by Solo Kota Kita, the local government, local architecture students, and RTs (neighborhood associations) to increase awareness of urban water issues, urban design methodologies and the competition process. These facilitated sessions will engage neighborhoods with the strategic vision of the project and identify opportunities for project sites.

Teams of residents from different areas of a neighborhood will be matched with architecture students to create models of their riverfront and design solutions to water-related problems. A jury of neighborhood leaders, government officials, and our team will pick a “winner” – we will then design and construct a prototype improvement based on the winning design.

After identifying a single neighborhood to test out the first instance of the Firm Foundation system, community members in that neighborhood will be trained by SKK and student designers to complete on-site fieldwork and stakeholder interviews. This research will refine identified needs and opportunities for the participatory design process. We will work with SKK to lead a participatory design session, working with residents to develop site plans for their neighborhoods. The Firm Foundation kit of parts will be applied to the neighborhood sites according to findings from the fieldwork and stakeholder interviews.

Competition as Campaign



CONTINUING WORK: FIRM FOUNDATION

Our role will be to develop creative strategies to visualize data about water-related problems and colorful and easy-to-understand tools such as neighborhood models to facilitate participation in design by community members.

The site plans created from the community design sessions will be shared during a public campaign and meetings organized by SKK in collaboration with local government. The first built instance of the Firm Foundation system will be determined by the most popular neighborhood plans from the community design sessions. In Indonesia, neighborhood design competitions are currently a popular way of increasing community engagement around key issues. Banjarmasin itself has completed neighborhood competitions related to trash clean-up and sanitation over the past two years. Our project follows a similar model, using urban design as a learning tool for planning and urban water issues.

Together these improvements will reduce water-related vulnerability as well as the impact of urban activity on the river ecology, improve the public realm, and reposition the river as a local asset. We will also create two booklets that document the campaign and kit of parts that will serve as a guide to both local government and community members for addressing water-related vulnerability in Banjarmasin.

Following the summer of 2012, we will work with local government, Solo Kota Kita, and AECOM hydrology engineers to put the winning Firm Foundation design into action for phases (3) Design and Engineering and (4) Implementation. As part of the prize for the AECOM competition, the global design firm has agreed to support the implementation of the project with engineering expertise and staff hours. We will work with AECOM to develop construction documents and perform preliminary engineering assessments, and with local government to organize the building and stewardship of the gabion system. We plan to hire a local construction manager to lead the construction and a longer-term community manager to maintain the public space and infrastructure. These key players will be identified through the Competition as Campaign phase this coming summer.



Local Impact

The objective for Firm Foundation is to decrease the costs of systemic vulnerabilities through a participatory urban design solution. Our project seeks to:

- Increase citizens' capacity for stewardship of infrastructure in their neighborhoods—saving city management time and funds.
- Improve livelihoods from increased resiliency. Residents will be able to mitigate systemic and environmental forces working against them.
- Increase opportunities for livelihoods from stewardship—residents can increase their incomes by working to improve their neighborhoods. This project will also support the capacity for residents to develop their own opportunities for work through increased mobility and access to infrastructure..

Participatory processes increase local capacity, decrease reliance on government and assure buy-in at the community level. The cost of vulnerability operates at multiple scales but so do the benefits of resiliency. Increasing livelihoods means increasing weekly income by a few dollars. Those few dollars increase self-sufficiency, which decreases residents' dependence on the municipal government for services. Those few dollars can scale up to economic efficiency for the city as a whole. These small neighborhood impacts multiply at larger scales and can translate to greater systemic resiliency.