

Cultivating Community Science and Clean Water in Bangkok, Thailand
Kerry Wong, Scripps College, USA.

PROJECT SUMMARY

In living with, working with, and listening to Bangmot residents in Bangkok, Thailand, my project explored the water chemistry and microbial populations in the Bangmot Canal to address the impacts of water quality issues on local communities and ecosystems. By teaching locals to test their own water and involving them into the research process, also known as citizen science, and organizing community workshops, my project increased accessibility to environmental education and incorporated locals in sustainable data collection.

PROJECT DESCRIPTION

How did you decide what issue(s) you wanted to address and what approach(es) or strategies you chose to implement in your project?

The deterioration of water quality has become a pressing issue in the Bangmot Canal region along the Chao Phraya River in Bangkok, Thailand. Dr. Jee Budthimedhee, chair of Design and Planning at King Mongkut's University of Technology Thonburi (KMUTT), has been leading numerous initiatives in the Bangmot region to understand and act on waterfront community resilience development. In recent years, Dr. Budthimedhee has been collaborating with Professor Purvis-Roberts and Professor Chandrangsou, in the Keck Science Department at the Claremont Colleges, to research the water quality and air quality of the Bangmot Canal. After exploring how land usage affects salinity and microbial communities in the Bangmot Canal and possible bioremediation solutions for my senior thesis under Professor Chandrangsou's lab, more questions came up. Why are salinity levels higher in some regions along the canal? How do microbial populations change with salinity and water chemistry levels? One of the main issues is that water quality collection has been infrequent, making it difficult to understand the issue. How could we view trends of the water quality in relation to land usage with little data? Most importantly, what is the locals' perspective on this issue? How does this affect the everyday lives of residents who live along the canal and shape the overall wellbeing of the Bangmot community?

In addition to further research to improve the water quality in the Bangmot Canal, our KMUTT collaborators and community organizers expressed a need for support with science education in their community. Thus, I worked with Dr. Budthimedhee, Professor Chandrangsou, and Professor Purvis-Roberts to form this project that centers citizen science, which involves local knowledge, community-based data collection, and collective action. Uplifting and including Bangmot residents in conversations about the Bangmot environment and ongoing research has been the top priority. I met with many Bangmot locals, from longtail boat drivers to snack shop owners to experts on environmental engineering, to learn about their perspectives on the water quality issue and develop programs that best fit their community and culture.

Why did you choose your host site? In what ways did local relationships support you or contribute to the project?

Bangmot is the hidden gem of Bangkok. Many Bangkok residents I met had never been to or even heard of Bangmot. Bangmot may not have the attractions or city life many might associate with Bangkok, but it has an undeniable charm to it. As you travel south of the bustling city towards the gulf of Thailand, the change in landscape is apparent. You'll likely hear the rumbling motor of the longtail boats speeding by on the khlongs (canals) before you see them, or notice clothes drying on the porch of traditional wooden Thai houses raised above the water. You might see your favorite produce grown on the farms and the dark green backdrop of mangrove trees. Or if you're lucky, you'll see otters and large water monitors keeping cool from the Thailand heat in the khlongs. Though, the sight of the water monitors might be alarming at first if you're easily frightened like me. Don't worry, they're probably more scared of you and won't bother you - most of the time.

The Bangmot Canal has served as a significant region for agriculture, fisheries, and transportation for over 200 years. The region was a fruit producing hub, populated with many tangerine

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plantations, but the agriculture industry has been on the decline for years due to rising salinity levels from rapid expansion of population settlements, economic growth, and land use. While the Bangmot community thrives and continues to sustain itself, its water pollution issue has become a pressing issue the government has ignored. Additionally, youth in this region have less access to quality education due to the majority of resources being concentrated in the city, and fewer opportunities to engage in hands-on science activities. In recent years, Bangmot community organizers have been advocating for changes in water management policies and working to attract visitors so more people can enjoy this beautiful region. Bangmot is my host site because I believe it is a vibrant community full of potential, and by cultivating a space of co-learning, scientists and local residents can work together and enact change.

The Bangmot community is the heart of this project. This project would not have been possible without my project advisors Dr. Budthimedhee, Professor Chandrangsue, and Professor Purvis-Roberts, as well as the support of local relationships- especially from the staff at Safetist Farm. Safetist Farm is a local farm and community space in Bangmot that grows fresh produce and offers activities for children and adults to learn about the nature-centered lifestyle. They welcomed me with open arms and treated me like family. Even during moments of uncertainty, the Safetist Farm team and local residents were incredibly supportive and had faith in me and my project. Through the Safetist Farm network, I had the opportunity to get to know numerous Bangkok residents and community organizers and gain insight into their lives and perspectives on the environmental issues in Bangmot.

What changes or adjustments did you make to your original plans, and why?

My project was primarily focused on building relationships with Bangmot residents, teaching them to use research equipment and test the water quality, and organizing educational science workshops for the community. Thus, it was not feasible to explore possible bioremediation solutions within my project time frame.

Did other fundraising efforts contribute to your project? What were they?

There were no additional fundraising efforts for this project.

Are there opportunities for continuing your work on this issue? If so, please describe.

More frequent data collection throughout the seasons is necessary to gain a better understanding of the water quality and its implications on the local ecology, biodiversity, and human health. From there, we can characterize the microbial populations and determine if any changes in the microbial population correlate with any of the differences in water chemistry. Additionally, continuing to incorporate Bangmot residents into the research process and putting their voices at the forefront is vital.

Reflection

How do you define peace? In what ways might your project contribute to peace? What changes occurred? Short-term? Long-term?

I believe 'peace' centers community care, empowerment, and support. The definition of 'peace' goes beyond the absence of war, conflict, and violence. It is multifaceted and complex, encompassing quality education, health equity, and overall well-being. My project addresses these 3 pillars through teaching Bangmot residents how to test the water quality and play an active role in the research process, sharing ongoing environmental research with the community, and advocating for them. I organized workshops at Safetist Farm for youth ages 4-15 where they played trivia on water pollution and learned to build their own water filter with recycled bottles and natural materials from the farm. Several of the children who participated in my activity shared that they loved learning about science but rarely had opportunities to do hands-on experiments in school. Additionally, the Safetist Farm team informed me that they wanted to have science activities for their community but didn't know much about science, but now they plan to continue implementing the activity I ran at future workshops.

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Through the Safetist Farm team, I met community organizers that were enthusiastic about my project and invited me to run a workshop at a TEDx event focused on environmental sustainability in Bang Khun Thian, Bangkok, Thailand. At the TEDx event, I met residents from all over Bangkok ages 18-50 who are also passionate about environmental justice issues. Similar to the workshops I ran for Bangmot youth, the TEDx attendees played trivia and built their own water filters to purify water from the Bangmot canal. They learned to use and interpret the same water chemistry test strips for this project's research, and were fascinated to learn about the pH, hardness, and metals from the water they tested. While the activity itself is simple, it helped generate conversations about Bangmot's water quality and encouraged participants to share their perspectives. A group of participants shared that they always thought science was difficult and uninteresting based on their experiences in school. However, after participating in my workshop and conversing with me, they loved the hands-on activity and realized that science is fun. Hearing that my activity shifted their mindset was one of my happiest moments this summer.

Identify a significant conflict you observed or encountered in your work (it could be any level of relationship: intra- or inter-personal, community/group based, and/or societal/global). How did you navigate the conflict and what would you like to learn more about as a result.

Heading into this project, my goal was to make science accessible to impacted communities in Bangmot and use collective action from the local level to implement change at the national level. However, it wasn't until I arrived in Thailand and spent time with Bangmot locals that I learned about the complexities of the water quality issue. Initially, I believed the water quality correlated to land usage and salt from the gulf of Thailand. While those are factors, residents revealed that the flow of the water gates controlled by the city lets in more salty water, and pollution from factories have been a major contributor as well. Many industries such as paper bleaching and butcher factories illegally release toxins into the khlongs with no consequences and the build up of toxins has left lasting effects on the health of the Bangmot community. To address this concern, I had roundtable discussions with locals in my workshops to gain a more nuanced understanding of the situation. With increased awareness about these issues, we can work together and organize to enact policy change.

Has your project changed the way you think about the world? How has the project changed, challenged, or inspired you?

While I was only in Thailand for 12 weeks, this experience has challenged me to think critically about my positionality and the way I see the world. I am incredibly grateful to have met so many Bangkok residents, of all ages with different life experiences, who graciously took the time to share their experiences, beliefs, concerns, and joys with me. The tight-knit community, ecocentric way of life, and dedication to improving the well-being of their community has been a big inspiration for me as I transition into a new chapter of my life. The lessons I've learned from the Bangmot community will be a guiding light for me as I continue advocating for accessibility to quality education, health equity, and environmental justice in my own community.

PERSONAL STATEMENT

This opportunity has been an invaluable experience that challenged me to rethink my values, priorities, and purpose. It has inspired me to continue advocating for communities most in need, where my thoughts and actions will be guided by the kindness and compassion imparted from the beautiful Bangmot community.