# UR Field Lab: Chiang Mai

**A report**

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## Overview:

Artificial intelligence, remote sensing, reforestation and user-centered design all shared a stage at the Understanding Risk (UR) Field Lab: Chiang Mai, an "unconference" that aimed to help attendees understand collaborative means to manage disaster risks. The unconference—a conference structured primarily by its participants —was held June 3 to June 28, 2019.

The problem at the center of this unconference was the recurrent urban flooding that affects many cities in the world, including Chiang Mai, a town located in the mountainous north of Thailand.

A city with an 800-year-old history, Chiang Mai has a persistent flooding problem. It lies at the foothills of a mountain range that extends up to Burma, and the Ping river flows through the city. The mountains cause a funneling effect for the river, which results in regular serious floods. These floods are moderate, not devastating ones where people lose their lives. But they do disrupt life in the city.

The UR Field Lab functioned like a flood risk management short intensive training, offering participants the chance to engage with the issue in a way that  encouraged creativity, collaboration and a multidisciplinary approach. The participants started out by trying to grasp the scope of the flood problem: how to quantify it and understand the causes, the environmental hydraulic process and flood risk. Each week had a theme, tackling a particular approach to flood risk management.

The lab brought together participants from multiple disciplines, which facilitated a collaborative problem-solving approach. Participants came from across the world, including the Philippines, Turkey, India, France, Nepal, Burma and Thailand. Their professions ranged from graphic design and engineering to doctoral students in social sciences and water engineering.

## WWF and Natural and Nature-based Flood Management

The conference in its third week featured a workshop that focused on how participants can use tools from nature to mitigate flood risk. The workshop was led by WWF's Dr. Missaka Hettiarachchi and Perrine Hamel, an ecosystem services scientist who co-leads the Livable Cities program at Stanford University's Natural Capital Project. Twelve participants attended the weeklong workshop, while 30 attended a shorter hour and a half session on natural and nature-based flood management methods.

The first part of the program was a condensed one and a half day training on the *WWF Natural and Nature-based Flood Management: A Green Guide* (Flood Green Guide, or FGG). The WWF team presented select modules from the full three-day FGG training to give participants a basic understanding of the guide's approach: emphasizing flood risk management rather than flood control. The training included a serious game exercise where participants selected options from a set of flood management measures to ensure maximum benefits for communities affected by the weather events.

By the second day, the participants had a fairly good idea of what the FGG principles are and were then asked to think about the simple ways these can be applied in the context of the Chiang Mai floods. They spent a day discussing the best ways to demonstrate application of natural and nature-based flood management methods and communicate them to the public.

The solution they homed in on was to develop a serious exhibit showing the importance and applicability of nature-based methods for the Chiang Mai floods. They decided to showcase the exhibit at the Living with Water Art & Science Fair, an exhibition set to take place soon after the conference.

First, the group used computer modeling software to simulate flood flow in four different land use scenarios with the regular amount of rainfall experienced in the watershed upstream of Chiang Mai: 1) with deforestation; 2) in the watershed's current state; 3) with modest reforestation; and 4) with a high level of reforestation.

They found that the highest level of reforestation would result in minimum flood flow.

They also built a city-scale model—a table-top model of the city with representations of the topography, buildings and the river Ping. On this model, they represented the computer simulated flood flow by using a tap to change the water level. The table-top city also had little models that spectators could play with to try out different flood management methods. For example, they could test the impact of permeability on flood levels by using polythene sheets with less permeability. Or they could try out houses with stilts. Showers were also fixed on top of the table to replicate different levels of rainfall.

Finally, workshop leaders created a series of fact sheets and a card deck of personas, fictional characters to help the training participants understand flood risk and mitigation methods from various perspectives.

By the end of the week the participants had converted the natural and nature-based flood management methods they learned into an actual working model.


**Key takeaways:**

1. **Promote training innovation.** All the UR Field Lab weeks had different themes and offered a combination of scientific design and artistic approaches. It was a collaborative unconference with no restriction on the time participants needed to spend in each group. People could come and go as they pleased.

2. **Acknowledge natural and nature-based flood management.** The organizers understood the importance of natural and nature-based flood management practices. By organizing an entire week around the FGG, they acknowledged these methods can be a key factor in flood-related decision-making.
3. **Be deliberate with training composition.** There were a lot of young people who took part in the conference, including recent graduates as well as young professionals from different fields. In this setting, fresh energy gathered like a critical mass in one place for one problem. The conference functioned like an idea pressure cooker, centered on flood risk management.
4. **Adapt training curriculum.** Specific modules from the Flood Green Guide can be combined and adapted to craft a short one and a half day training as an alternative to a full three-day curriculum.
5. **Include direct and visual impact.** After the weeklong training, the group targeted decision makers and citizens with a visual representation of the FGG principles and practical applicability for addressing a real-world problem.
6. **Demonstrate the potential of art and science together.** The conference demonstrated new perspectives on the application of creative learning approaches, combining art and science.
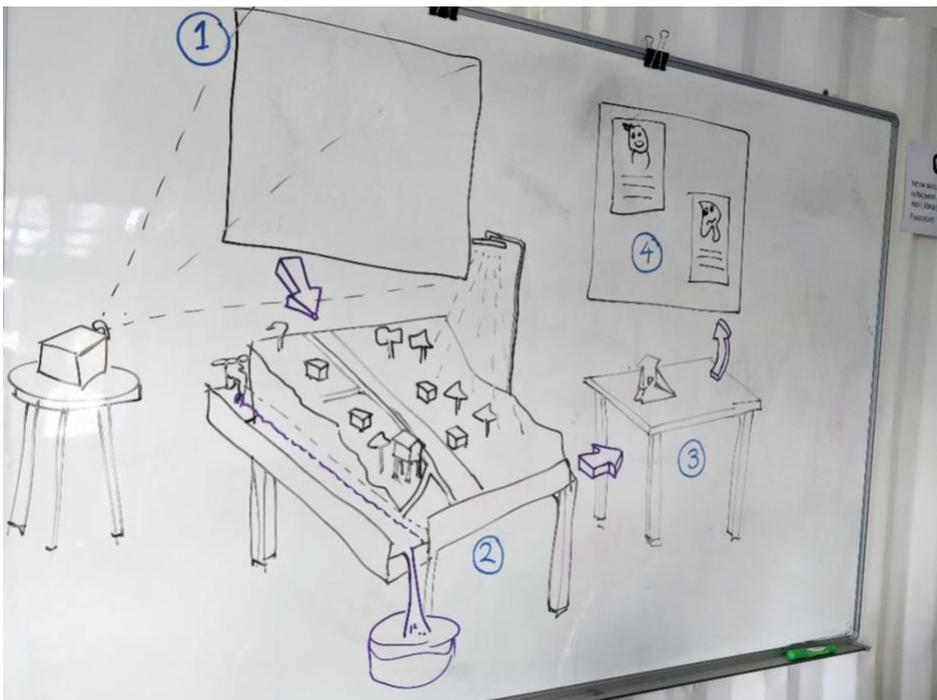
**Photos:**



The Nature-Based Methods working group plays the FGG serious game. (Photo: Bhola Saha)

Discussing the potential outputs after mini FGG training. (Photo: Bhola Saha)



Conceptual diagram of the model (Photo: Missaka Hettiarachchi)

Actual table-top city model (Photo: Rebecca Bicksler)