



Meet the interface of climate adaptation governance: A case study on water management from Taiwan

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Outline

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1. Background

- The relationship between climate and society has always been dynamic (Hulme, 2010), and so is the need for various types of **climate adaptation**.
- However, adaptation strategies may increase the vulnerability of other **groups** and **sectors** in terms of **maladaptation** (Barnett and O'Neill, 2010), in particular faced with changing climate events.



2. Objectives

- This study addresses a **reservoir dispute** in **Meinong** Township of Taiwan concerning both **water shortage** and **heavy rainfall** events in a changing climate.
- We present an **interface** of climate adaptation governance that provides **insights** into residents' and government's responses to climate change from a water management perspective.



3. Methods

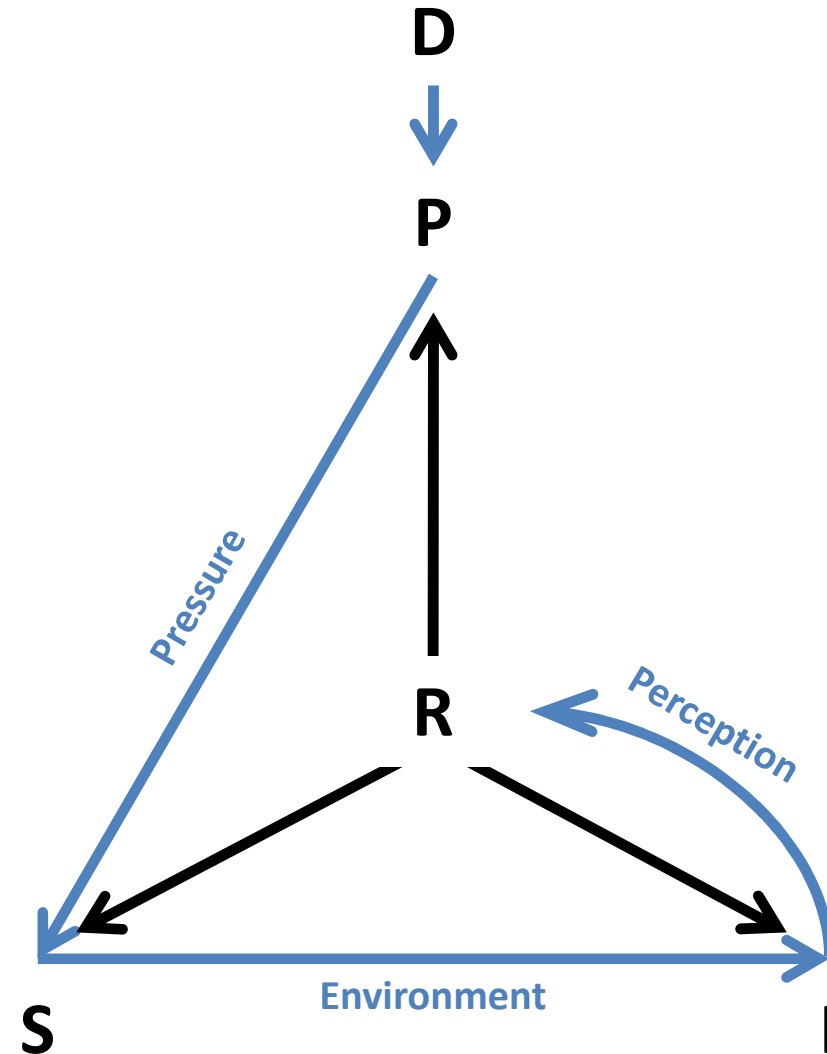
- Drawing on DPSIR framework (EEA, 1999), we first develop a cause-effect concept **ESAR (Exposure-Sensitivity-Adaptability-Response)** to understand and identify causes, impacts, and responses under climate change.
- Based on ESAR framework, **semi-structured interviews** were conducted in township Meinong to gain insights into **resident perceptions** when exposed to climate events.



- DPSIR framework

DPSIR addresses clear information for policy making:

- ↓ **D** Driving forces
- 1. the resulting environmental **P**ressures
- 2. the **S**tate of the environment
- 3. **I**mpacts from changes in environmental quality
- 4. the societal **R**esponse to these changes

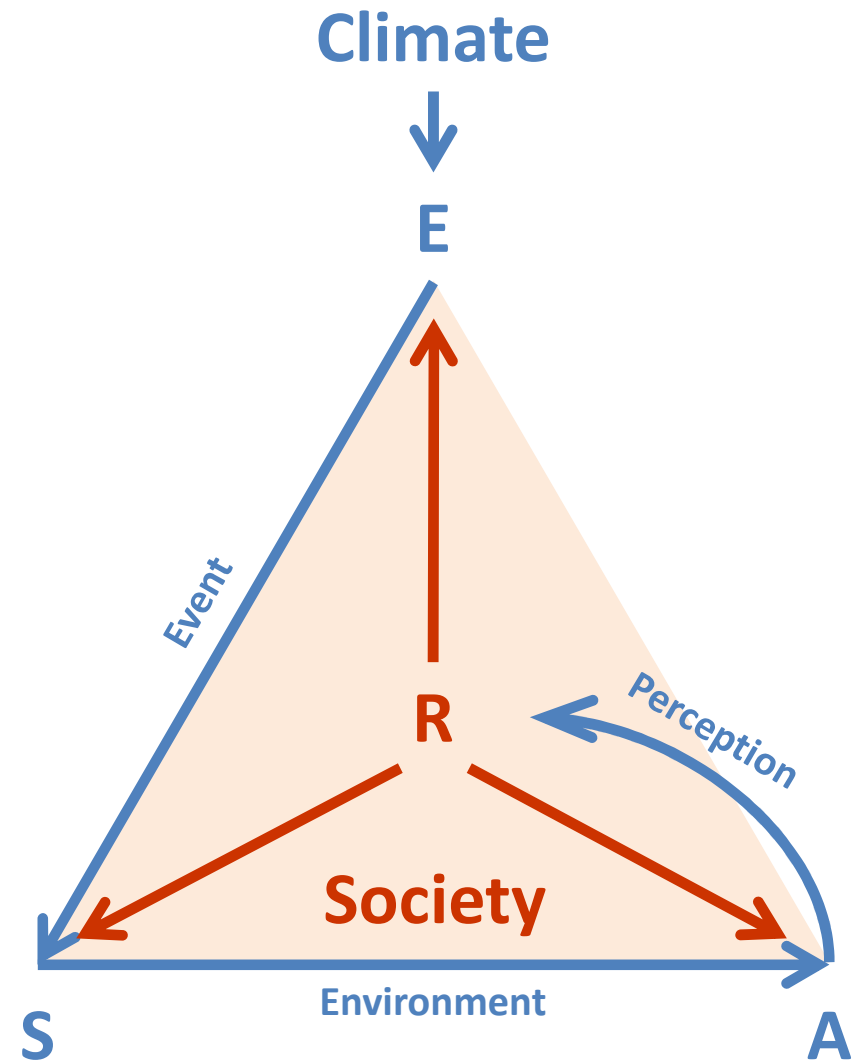


- ESAR concept

We relate DPSIR framework to vulnerability concept under climate change to address:

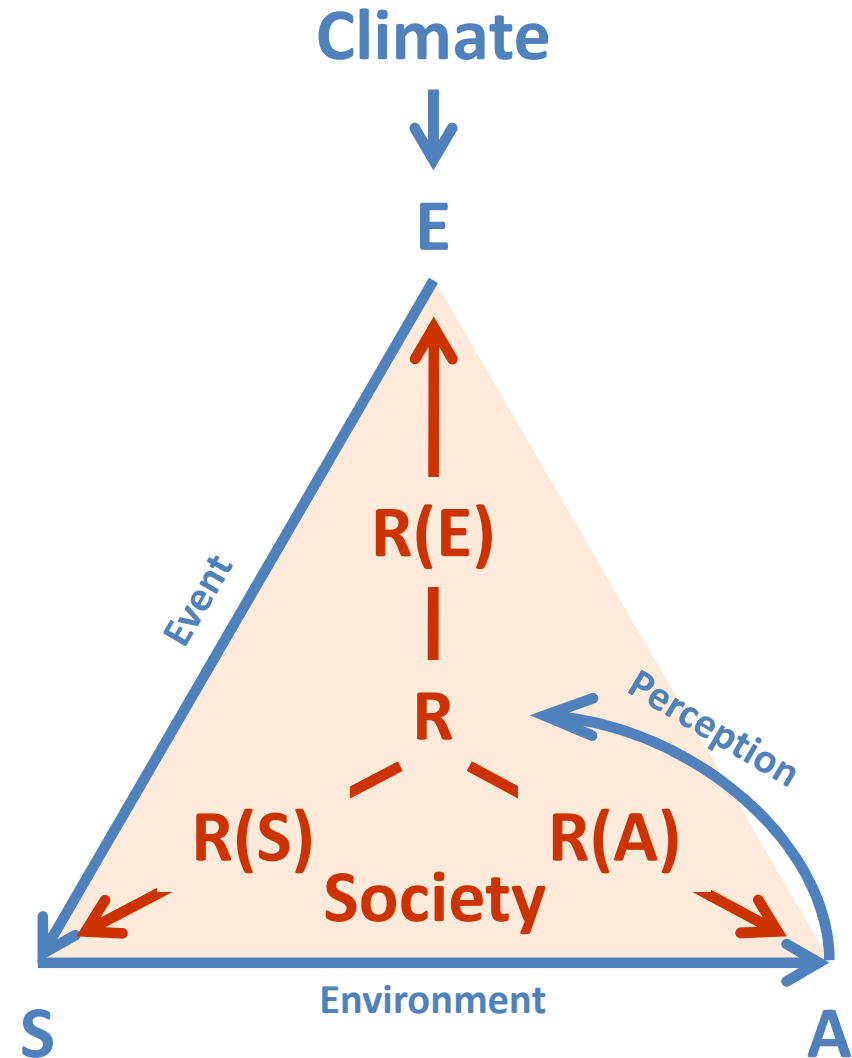
1. Exposure
2. Sensitivity
3. Adaptability
4. Response

on causal relationship
(Chiang, 2012)



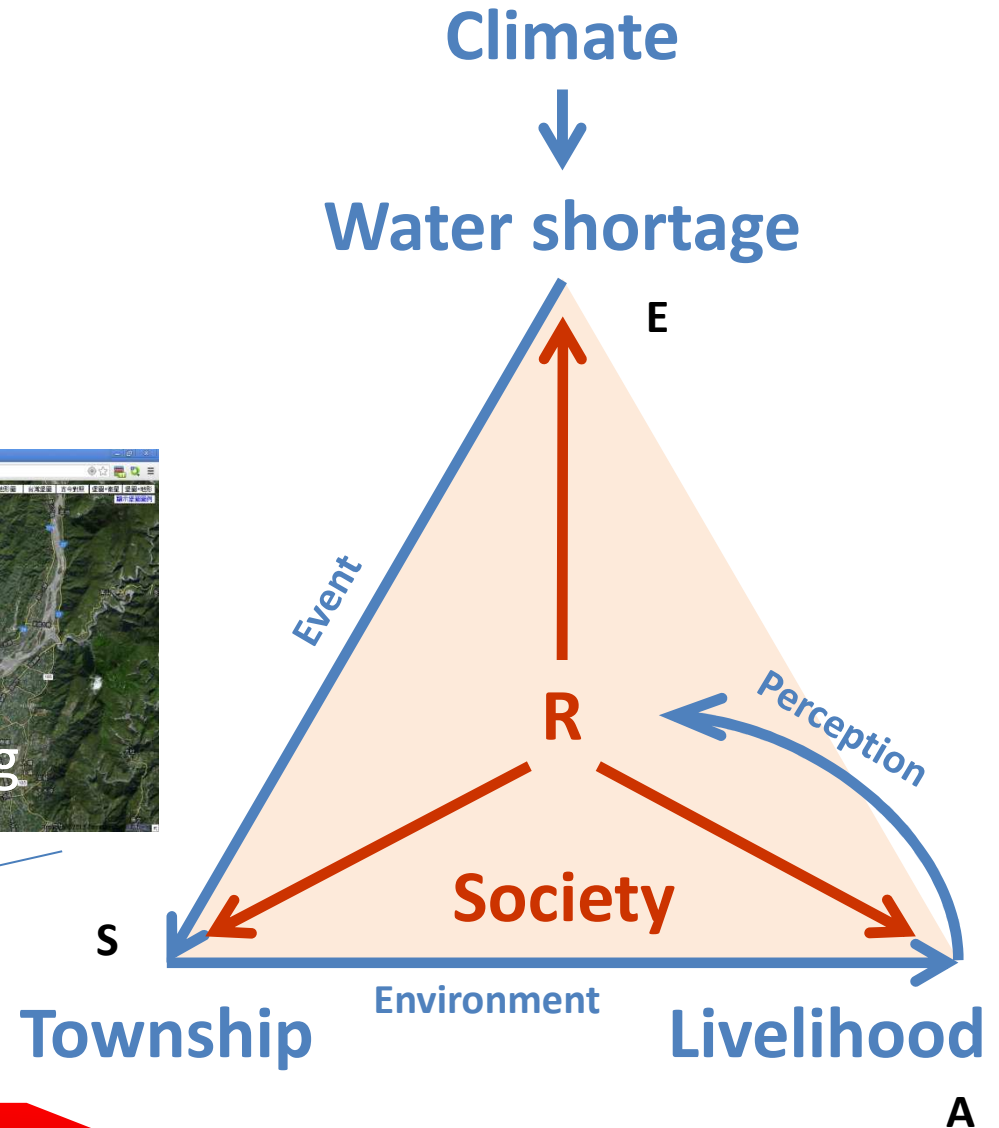
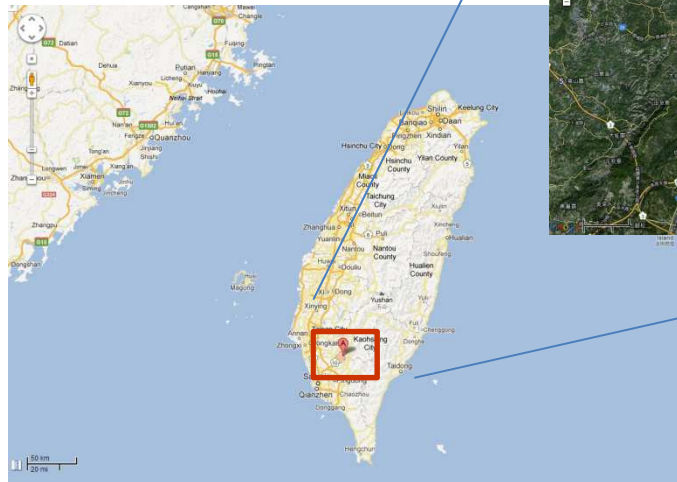
- ESAR concept (continued)

- R is comprised of **R(E)**, **R(S)**, **R(A)**
 - R(E): Response to E
 - R(S): Response to S
 - R(A): Response to A
- R(E), R(S) and R(A) demonstrate dynamic adaptation system in terms of climate governance



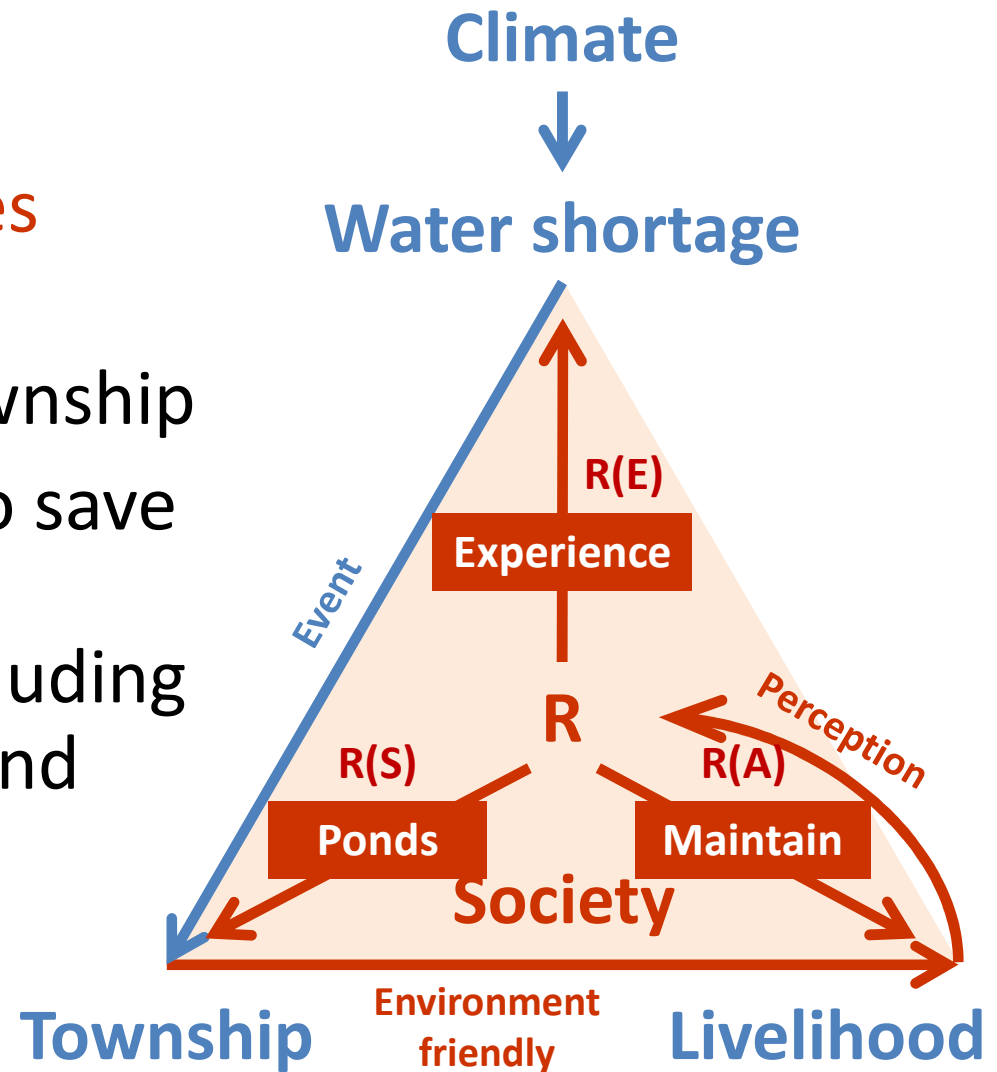
4. Case study

- **E:** Water shortage
- **S:** Township
- **A:** Livelihood



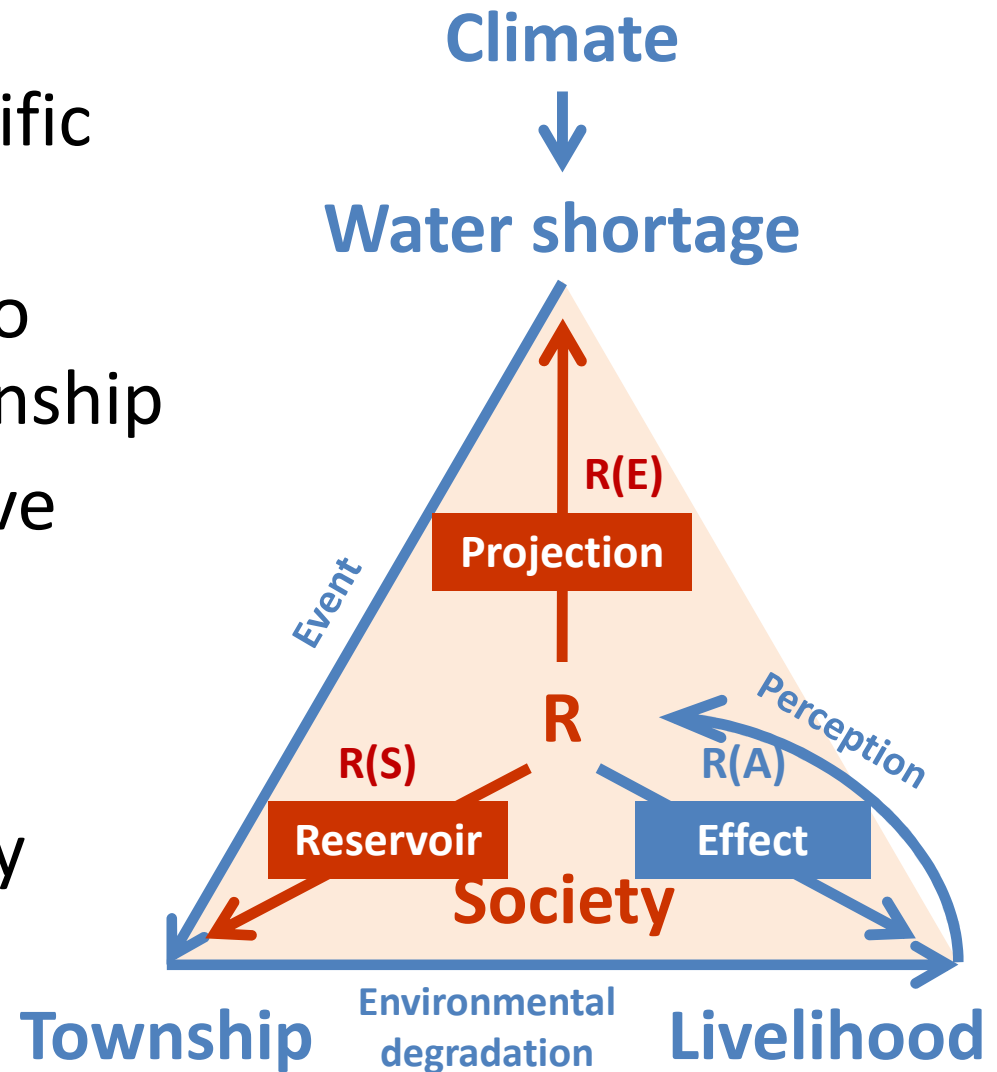
- Ponds (residents)

- R(E): learning from traditional **experiences**
- R(S): there have been available **ponds** in township
- R(A): reusing ponds to save water can **maintain** livelihood options including irrigated agriculture and fishery



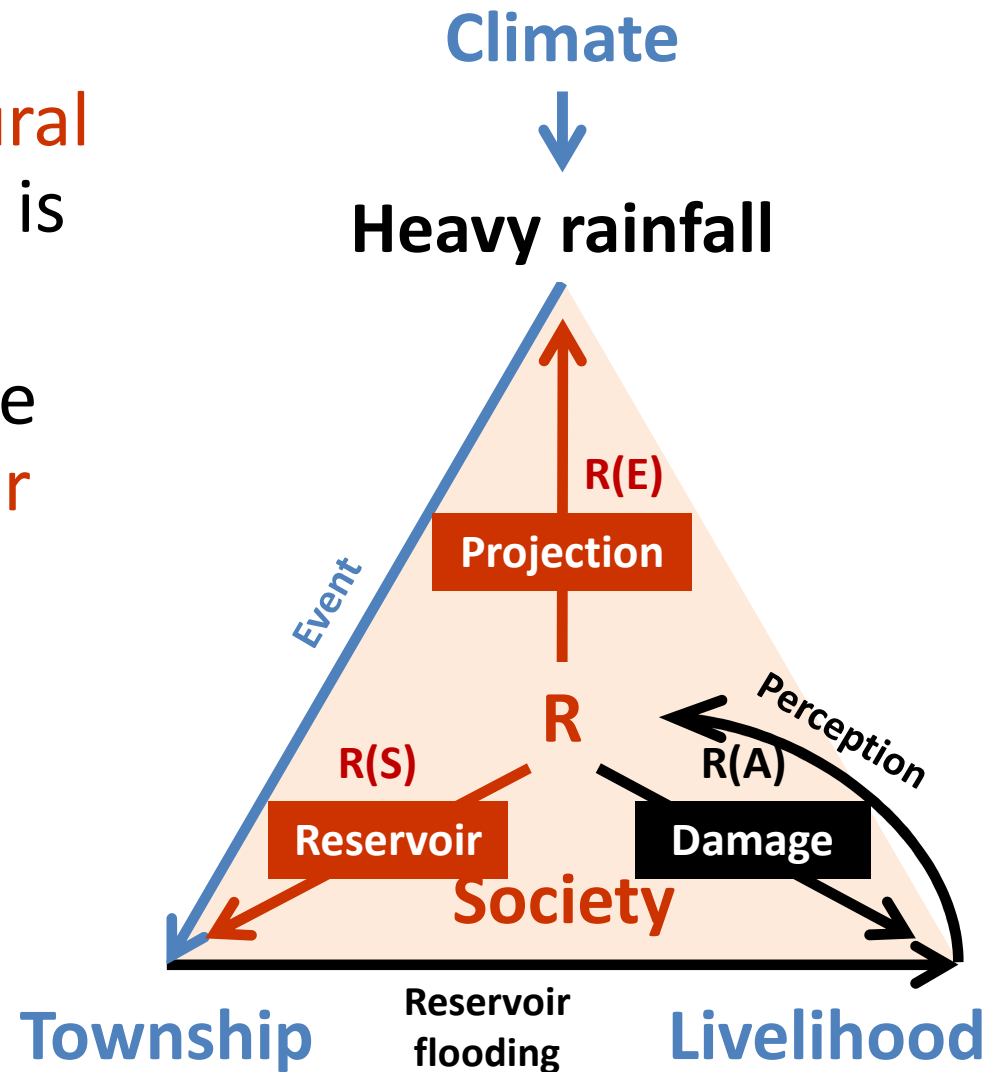
- Reservoir (government)

- R(E): relying on scientific **projection**
- R(S): there is a need to build **reservoir** in township
- R(A): reservoir can save water but may **effect** livelihood options including irrigated agriculture and fishery



- Reservoir flooding

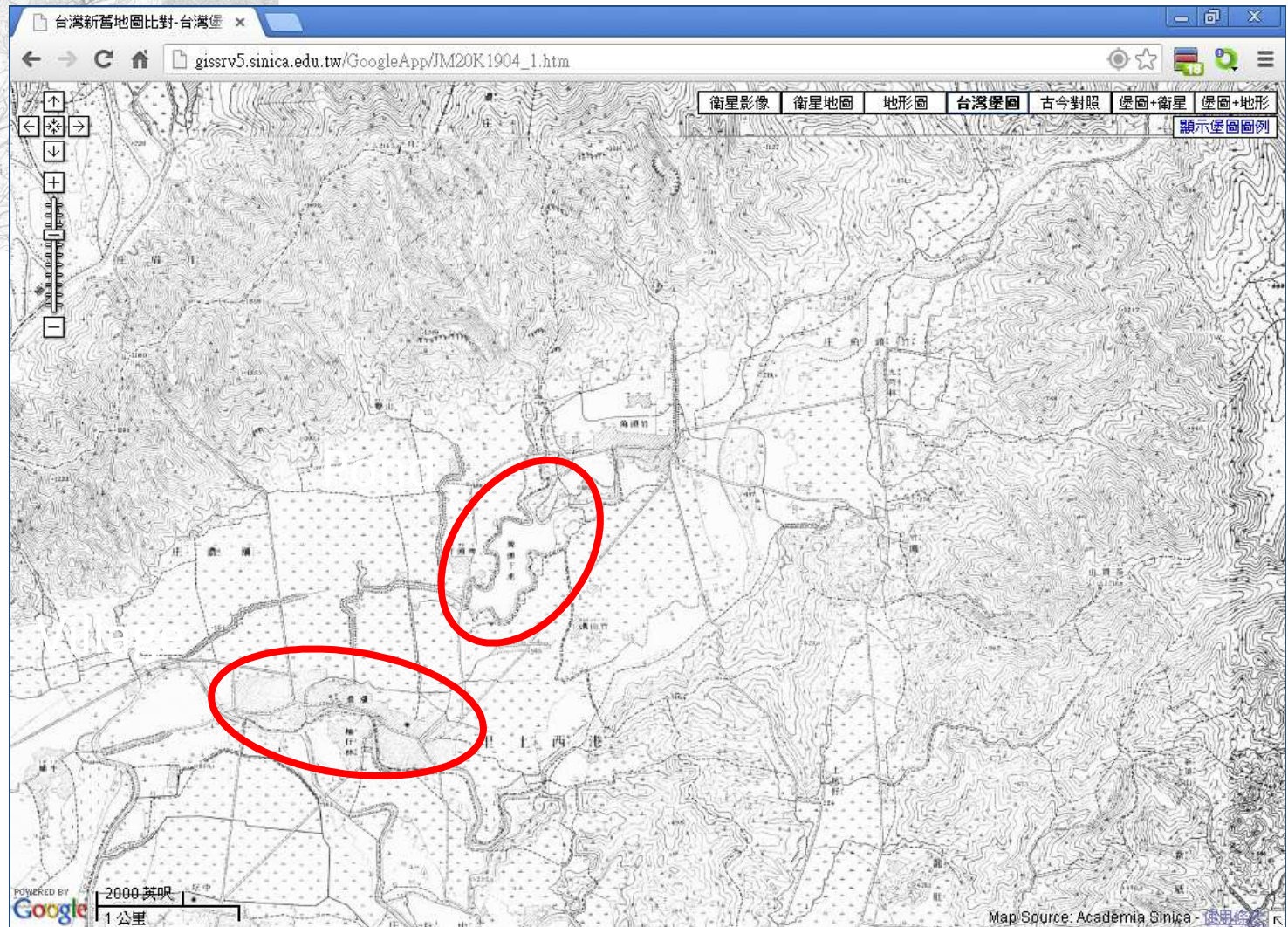
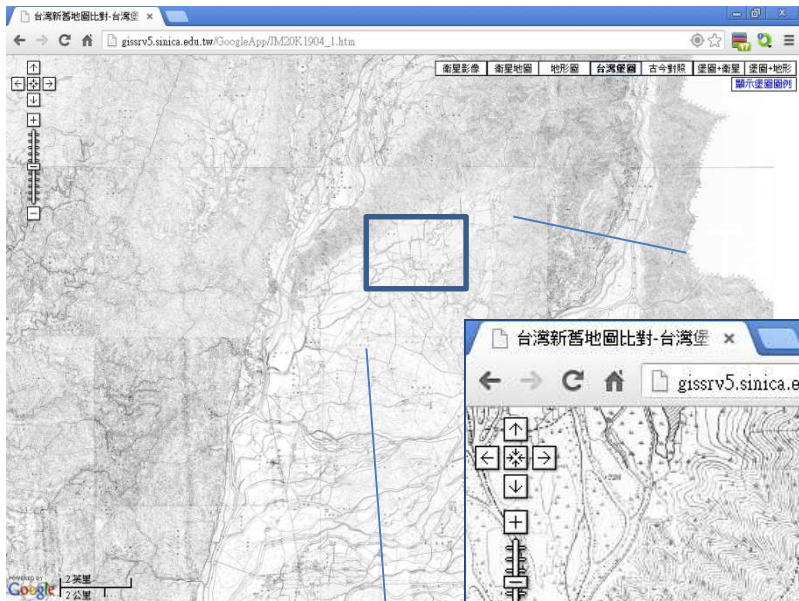
- The area forms a **natural pond** whenever there is heavy rainfall.
- But residents are more concerned of **reservoir flooding**.

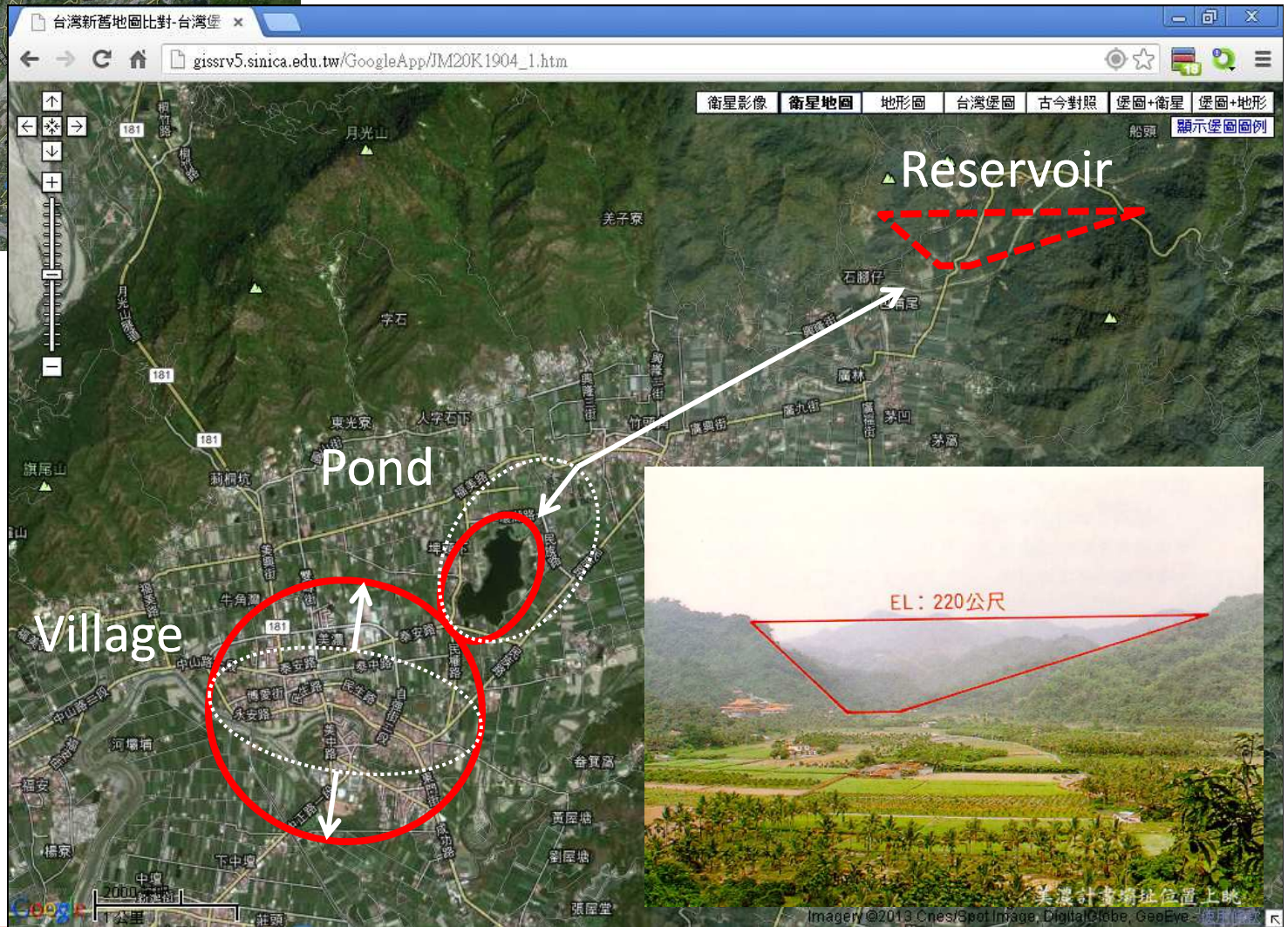
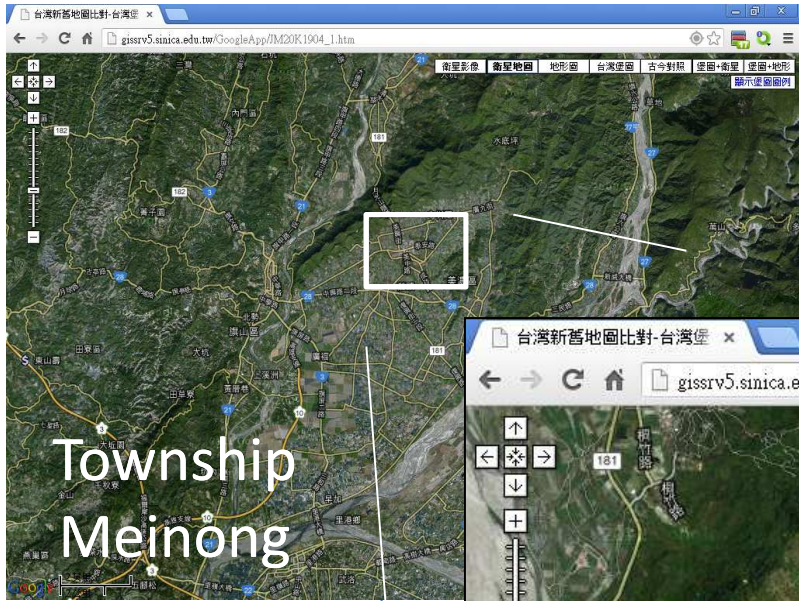


- Reservoir vs. Ponds

- Both reservoir and ponds can save water to cope with water shortage.
- The locals viewed the government reservoir proposal to address **water shortage** (rather a metropolitan issue) as maladaptation due to the risk of **reservoir flooding** when faced with new climate event **heavy rainfall**.
- Creating **retention ponds** to deal with both water shortage and heavy rainfall along the river was suggested as another adaptive option.
- **Climate adaptation governance** may contribute to allocating responsibilities and risks between public and private partners.







5. Discussions

- We underline the interaction of **climatic, environmental, and human factors** (IPCC, 2012).
- Our study indicates the need of **exploring cultural changes** to address how the **Meinong Hakkas** adapt to climate change through cultural lenses.
- **Their experiences** provide the policy-makers an insight into a complex of adaptive practices which include not only **making livelihood, enhancing social cohesion, but also manifestation of spiritual world**, rather than the solutions and policies proposed and practised by the experts' scientific knowledge (Tsai, 2013).



6. Conclusions

- Since repeated **experience** with an event produces a stronger **memory** for the event (Davies and Pezdek, 2010), we conclude that **local knowledge** is the key that contributes to communicating water management to advance climate adaptation.
- This paper introduced **ESAR concept** to have **insights** into different responses to climate change and call for new advanced arrangements to integrate traditional skill and technical support to build a more **adaptive system** in terms of **governance**.



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THANKS FOR YOUR ATTENTION!

