Nature-based Solutions and Local & Indigenous Knowledge

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CARBON GOVERNANCE IN SOUTHEAST ASIA

- **Objective:**
  - To strengthen understanding of effective disaster risk solutions through nature-based, local and indigenous knowledge contributing to resilience in Asia

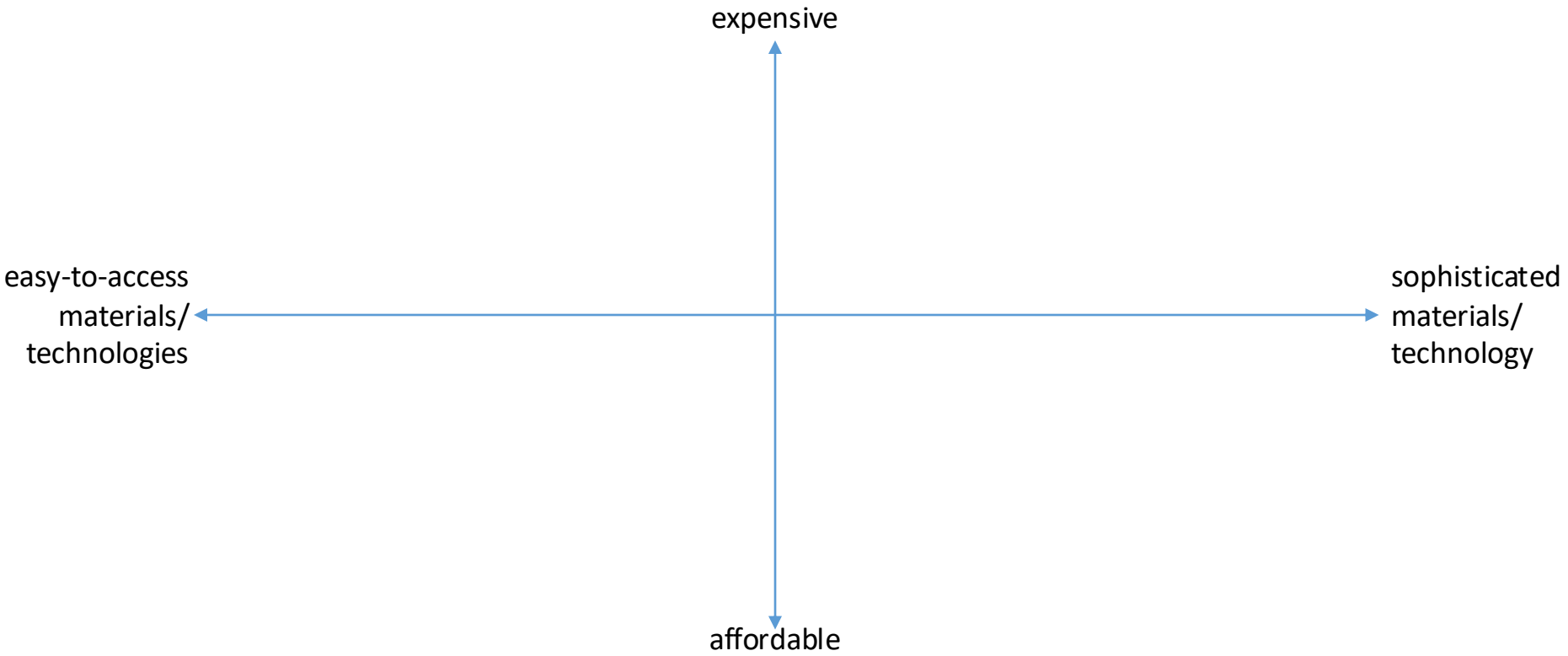
- **Session outline:**
  - Introductions and Activity
  - Presentation
  - Activity
  - Conclusion
  - Q&A

Introductions

- Which country are you from?
- Example of a natural hazard/disaster
- Example of a disaster risk solution

Let’s hear from 4-5 of you!

Post-it note activity: Disaster Risk Solutions



Nature-based solutions

"actions to protect, sustainably manage, and restore natural and modified **ecosystems**,

that address **societal challenges** effectively and adaptively,

simultaneously providing **human well-being and biodiversity benefits**"

(Cohen-Shacham et al. 2016, xii)

Kallang River at Bishan-Ang Mo Kio Park, Singapore

Nature-based solutions

UGM Hydrology Expert Explains Causes of Sumatra Flash Floods and Key Prevention Measures

News Report 17 December 2025, 15.56 By : donnie.trisfian

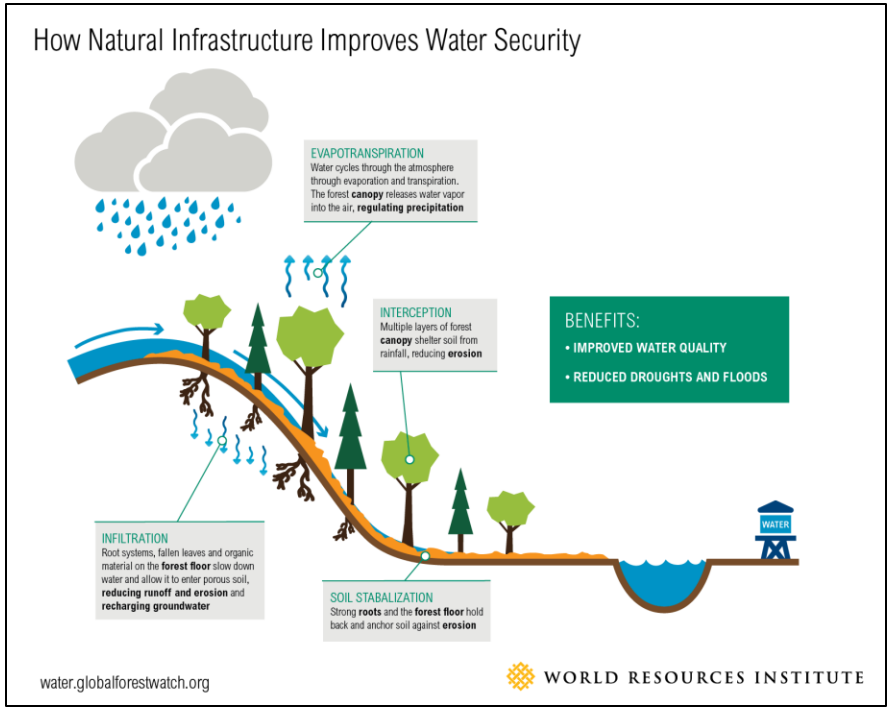
Professor Maryono further explained that flash floods generally occur due to very heavy rainfall combined with slope failures along medium- and small-sized rivers. However, in this case, widespread deforestation across several areas is suspected to have significantly increased runoff, leading to major flooding.

“What we observed were deforested areas that triggered increased runoff. This was further compounded by landslides or natural blockages, which ultimately led to severe flooding,” Professor Maryono explained.

As for preventive measures, Professor Maryono emphasized the importance of prioritizing environmentally friendly development. The application of eco-hydraulic approaches, he said, could help prevent future flood disasters.

“Eco-hydraulic methods, for example, require widened riverbanks to be planted with fast-growing vegetation to trap sediment. This helps stabilize river slopes,” Professor Maryono explained.

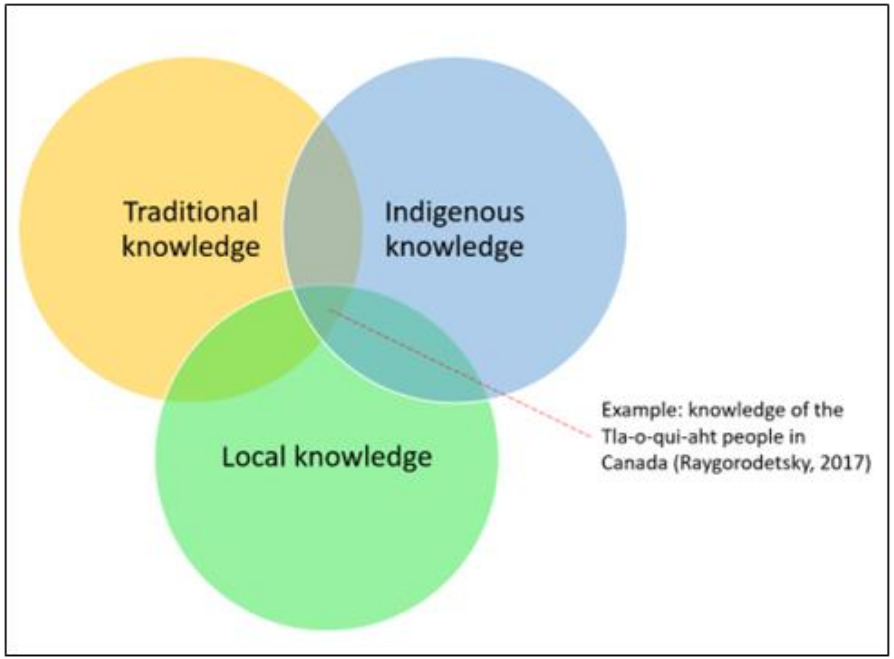
Nature-based solutions

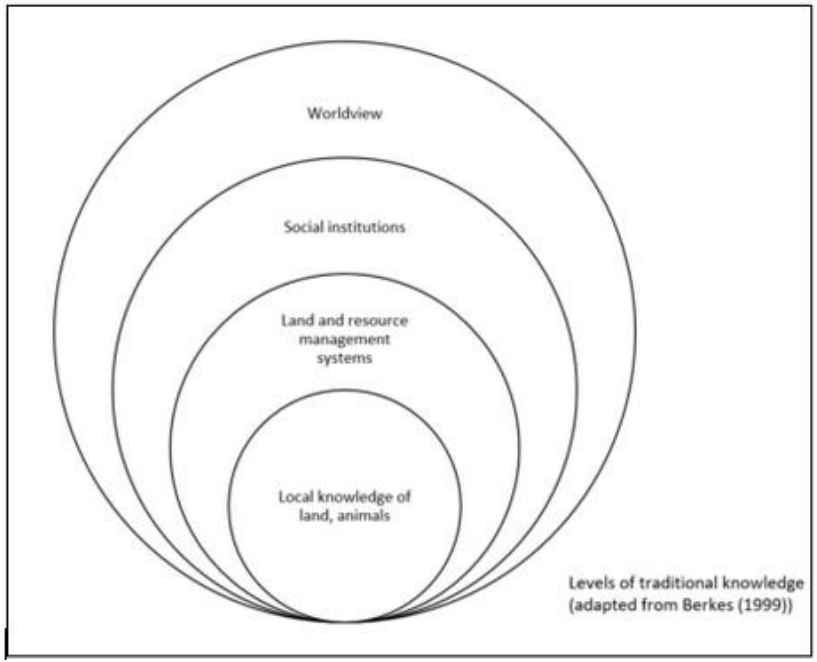


https://www.globalforestwatch.org/blog/forest-insights/watersheds-lost-up-to-22-of-their-forests-in-14-years-heres-how-it-affects-your-water-supply/

Sunkur et al (2023)

Local and indigenous knowledge





Local and indigenous knowledge

Indigenous Karen knowledge for predicting natural disasters

February 18, 2013

https://kesan.asia/karen-indigenous-knowledge-for-predicting-natural-disasters/

ELSEVIER

International Journal of Disaster Risk Reduction

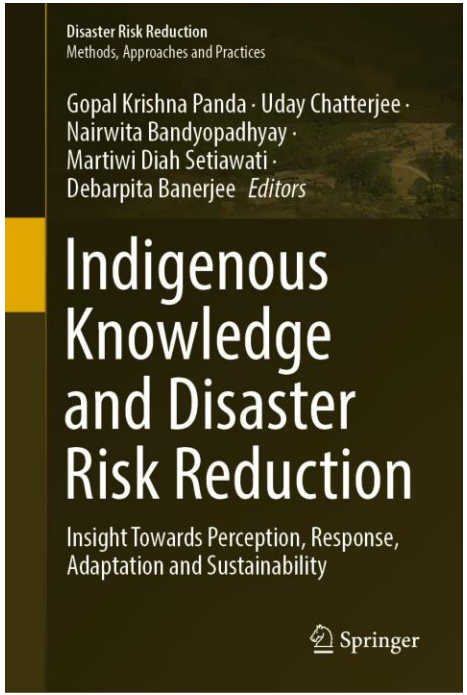
Volume 108, 15 June 2024, 104492

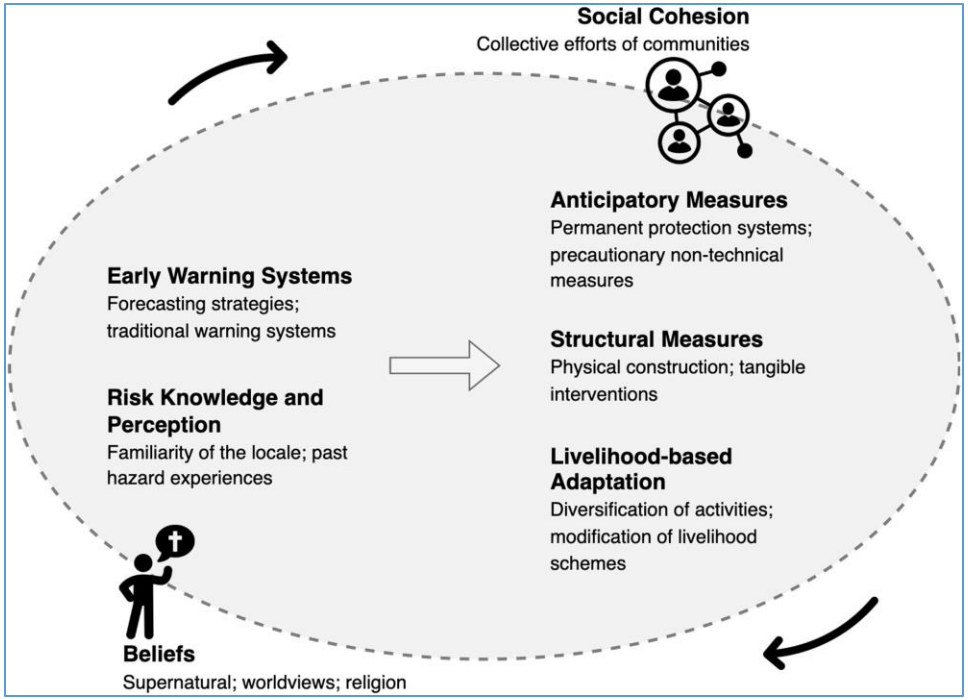
Using traditional knowledge to reduce disaster risk - A case of Tibetans in Deqen County, Yunnan Province

Zhou Hao [a] ✉, Yin Lun [b c] ✉

- Cosmology
- Role of women in the intergenerational transmission of TK
- Updating of TK

Local and indigenous knowledge





Hadlos et al (2022)

Activity

- In your respective roles, how do you incorporate / integrate / include local and indigenous knowledge?

  - https://www.menti.com/alwyvdcqrgjb

menti.com
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Conclusion

- Summary
  - NbS
    - Ecosystem management that provide co-benefits
  - LK/IK
    - Different levels of knowledge
    - Working with diverse knowledges: Recognise, Respect, Reflect
  - Often, cheaper and easier to implement

- Can all NbS, LK/IK eliminate disaster risk completely?
  - No, but it can reduce.

Conclusion

Addressing the human costs and consequences of the Pakistan flood disaster

Zulfiqar A Bhutta [a,b] ✉ · Shereen Zulfiqar Bhutta [c,†] · Shabina Raza [d] · Ali Tauqeer Sheikh [e]

killed.[1] Almost 24 000 schools have been damaged[2] and thousands of roads and bridges lost. The economic costs of the floods, with the loss of infrastructure and crop and food production, are estimated to exceed US$30 billion.[3] This far exceeds the $1·5 billion emergency relief that Pakistan had negotiated with the International Monetary Fund over the past year.[4]

The global recognition and response to the crisis was initially also slow and uncoordinated. It took the UN Secretary-General to launch a flash appeal for $160 million[12] for some assistance to start trickling in. External commitments for flood relief are very slow and the visible scale and cost of the disaster dwarfs funding that has been committed.

https://disasterphilanthropy.org/disasters/2022-pakistan-floods/

Prof. Bhutta at a seminar by the Global Heat Health Information Network (GHHIN) Southeast Asia Hub, 3rd February 2026

THANK YOU

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