Participatory approaches for traditional and enhanced water management practices

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Participation:

"the fact that you take part or become involved in something"

Cambridge English Dictionary

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Part 1 – Participatory research

Participation:

- Very **broad concept** (Lane 1995)
- It **means different things** to **different people** (Hussein 1995; Kelly 2001)
- Term often used by **people with different ideological positions**, who give it very **different meanings** (Nelson and Wright 1995)
- Pelling (1998): participation is an **ideologically contested concept which produces a range of competing meanings and applications**.
- A variety of views on **how** participation is defined, **whom** it is expected to involve, **what** it is expected to achieve, and **how** it is to be brought about (Agarwal 2001)

Participatory research: What is it?

Lane J (1995) Non-governmental organisations and participatory development: the concept in theory versus the concept in practice. In 'Power and Participatory Development'. (Ed. S Wright). (Intermediate Technology Publications: London)

Hussein K (1995) Participatory ideology and practical development: agency control in a fisheries project, Kariba Lake. In 'Power and Participatory Development'. (Ed. S Wright). (Intermediate Technology Publications: London)

Kelly D (2001) 'Community participation in rangeland management : a report for the Rural Industries Research and Development Corporation.' (RIRDC: Barton ACT)

Nelson N, Wright S (1995) Participation and power. In 'Power and participatory development'. (Ed. S Wright). (Intermediate Technology Publications: London)

Pelling M (1998) Participation, social capital and vulnerability to urban flooding in Guyana. Journal of International Development 10, 469-486.

Agarwal B (2001) Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. World Development 29, 1623-1648.

Participatory ladder

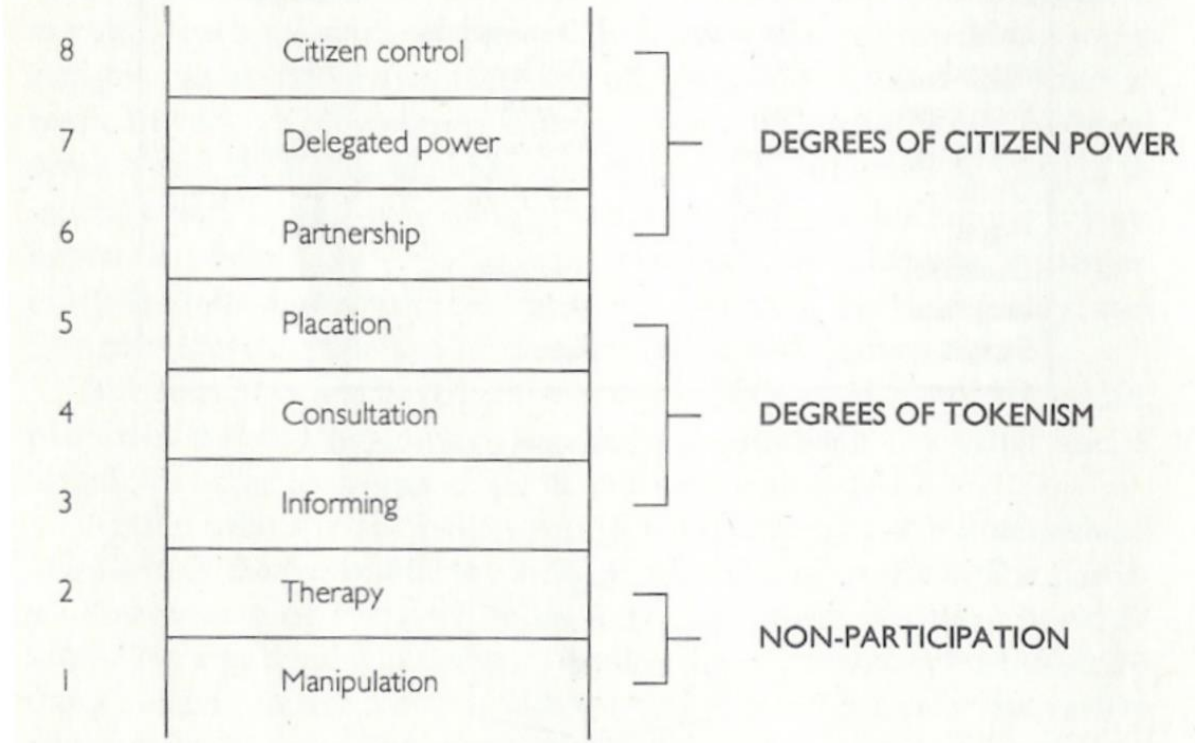
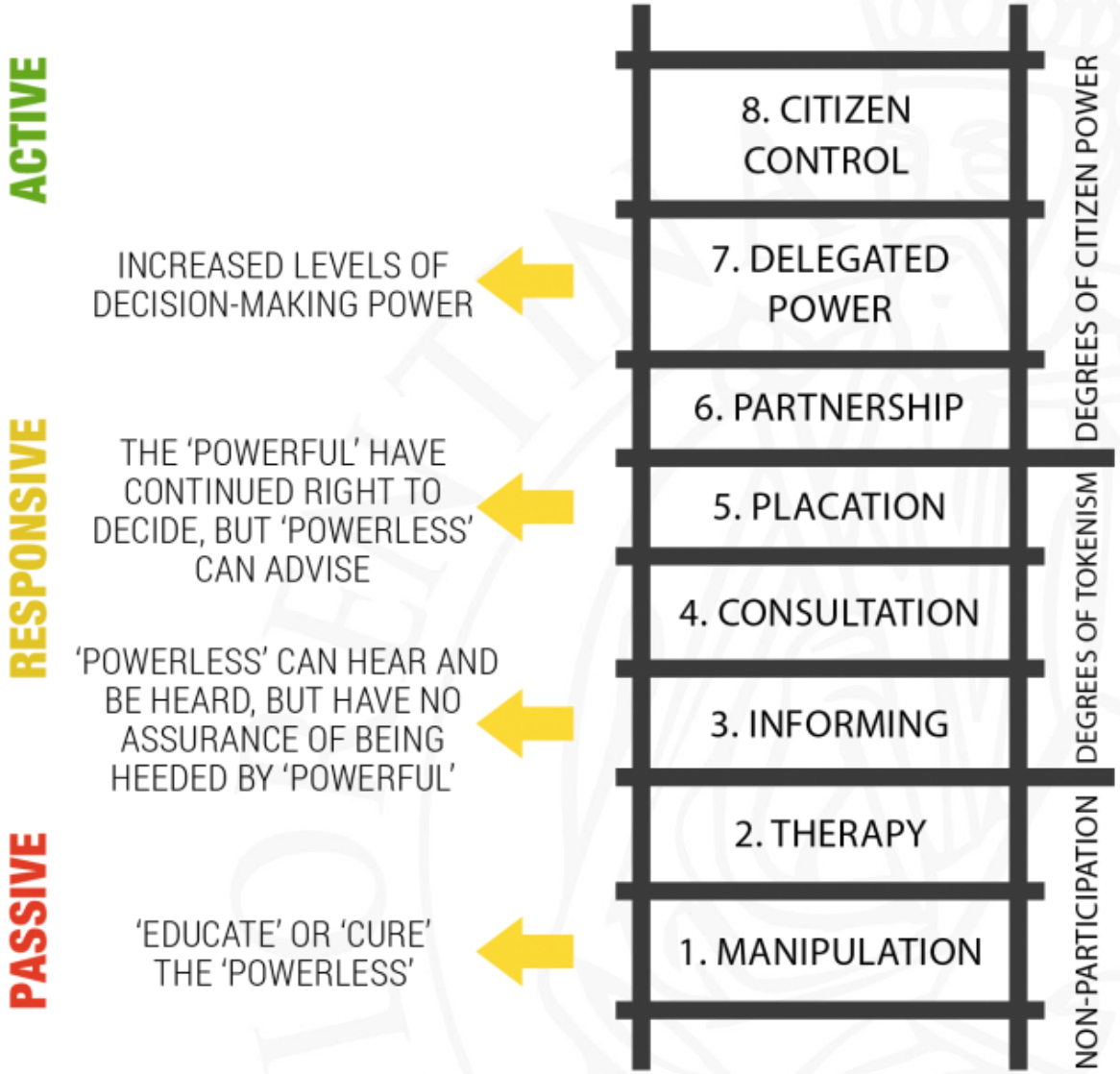


FIGURE 5.2
A 'Ladder of Citizen Participation' (from Arnstein, 1969).

Participatory ladder



Participatory research: What is it?

Some definitions...

"Participatory research methods are geared towards planning and conducting the research process ***with*** those people whose life-world and meaningful actions are under study. Consequently, this means that the aim of the inquiry and the research questions develop out of the **convergence of two perspectives**—that of science *and* of practice**. In the best case, both sides benefit from the research process.**"

Bergold, Jarg & Thomas, Stefan (2012). Participatory Research Methods: A Methodological Approach in Motion [110 paragraphs]. F*orum Qualitative Sozialforschung / Forum: Qualitative Social Research,* 13 (1). Art. 30, http://nbn-resolving.de/urn:nbn:de:0114-fqs1201302.

Participatory research: What is it?

Some definitions...

"Participatory research **comprises a range of methodological approaches and techniques**, all with the objective of **handing power from the researcher to research participants**, who are often community members or community-based organisations.

In participatory research, participants have **control over the research agenda**, the process and actions. Most importantly, **people themselves are the ones who analyse and reflect** on the information generated, in order to obtain the findings and conclusions of the research process.

Participatory research involves **inquiry, but also action**. People not only discuss their problems, they also think about possible solutions to them and actions which need to be taken."

Participate initiative, 2021.

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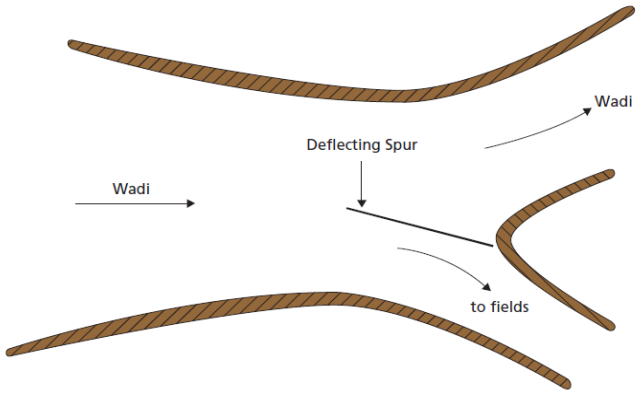
Part 2 – Some examples

A participatory design approach for modernization of spate irrigation systems

Spate irrigation a **form of Water Resources Management** based upon the **diversion of floodwater** from seasonal riverbeds:

- typical of **arid and semi-arid countries**, water is usually present for few hours;
- it covers around 3 million hectares of irrigated land around the world;
- **neglected** in the technical literature, academia and research despite its long history and relevance for rural livelihoods;
- Relevant for **adaptation to climate change**



Spate irrigation schemes

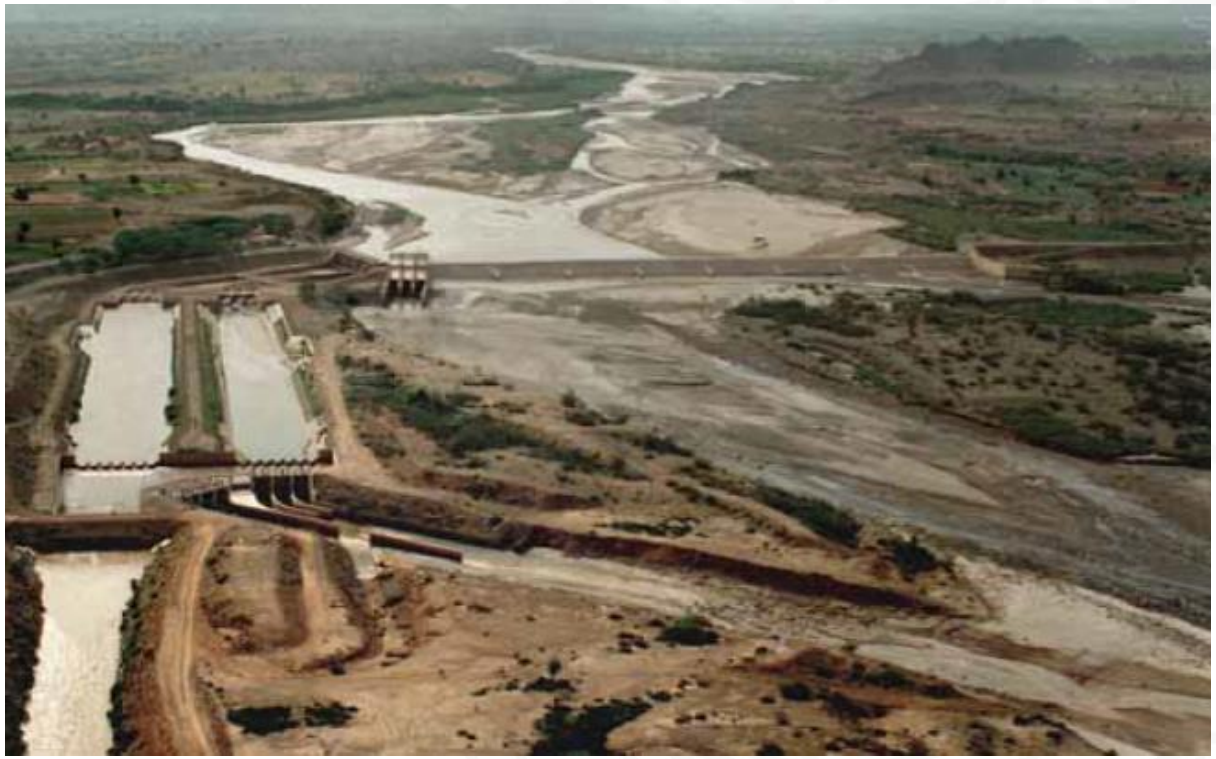
Based on the diversion of floodwater through the use of artificial bunds built within the riverbed

Traditional spate irrigation schemes

Spate irrigation schemes

Based on the diversion of floodwater through the use of artificial bunds built within the riverbed

Modernized spate irrigation schemes



Modernization of spate-irrigated agriculture in **Tigray Region** (Ethiopia) failed to obtain desired results

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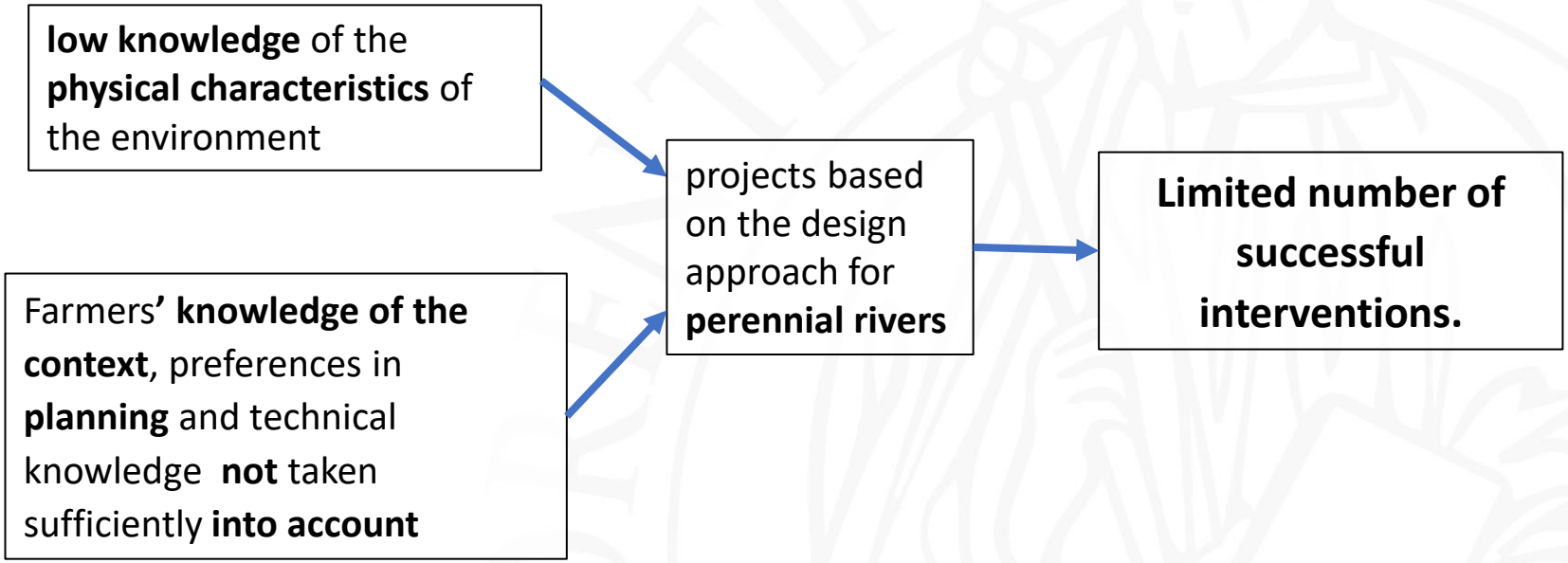


In Raya valley, traditional spate schemes are still performing better than modernized ones

Research objectives

- To develop and apply a participatory approach to design for improvements in spate irrigation systems, based on:
  - Identification of the problems of the scheme and selection of technical solution for attenuating/removing most relevant ones.
  - Incorporation of farmers' preferences and knowledge in design.

Research methodology

Based on Diagnostic Analysis

"appraisal and analysis of existing irrigation systems with the objective to identify problems and to define the causes or constraints, underlying these problems" (Falciai, 1996)

System Analysis

↓

Problem Analysis

↓

Problem Ranking

↓

Selection of solutions

↓

Design

Research methodology: Participatory Rural Appraisal (PRA)

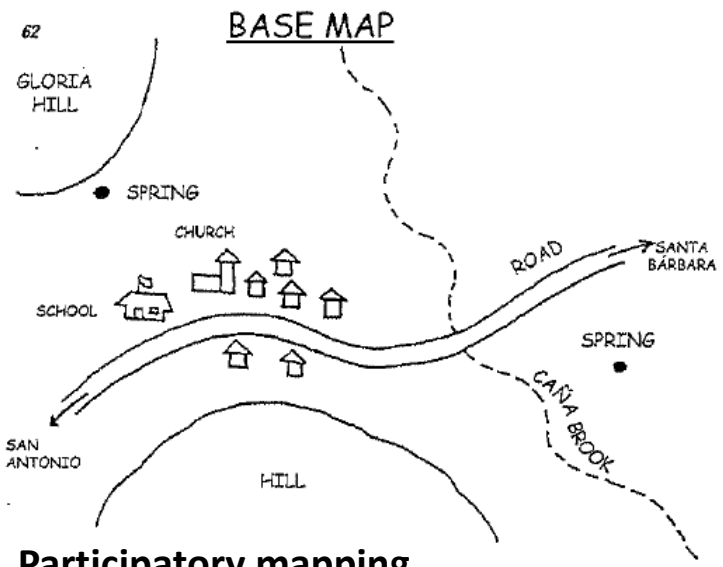
"Family of approaches and methods to enable local (rural or urban) people to **express, enhance, share and analyse their knowledge** of life and conditions, to plan and to act" (Chambers, 1994: 1253).

Chambers, R. (1994). Participatory rural appraisal (PRA): Analysis of experience. World Development, 22(9), 1253-1268.

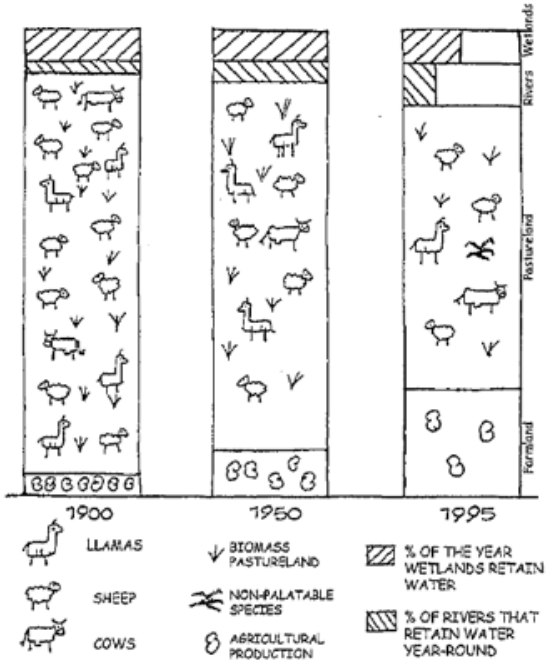
Key concept in PRA: **local people are creative**, capable of carrying **their own analysis**, identifying **problems and constraints**, **planning** and eventually **taking actions**.

Researchers and field workers should act as **facilitators and help local people to carry on their own system analysis**. (Cavestro, 2003)

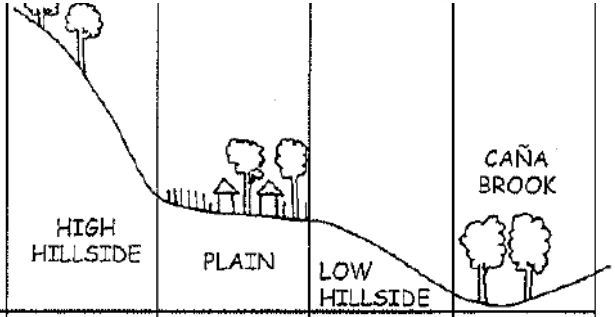
Cavestro, L. (Producer). (2003, 25/03/2014). P.R.A. - Participatory Rural Appraisal Concepts Methodologies and Techniques.



Participatory mapping



Historical diagrams



	HIGH HILLSIDE	PLAIN	LOW HILLSIDE	CAÑA BROOK
SOIL	Poor, rocky	Muck – loose earth	Red earth; very rocky	
WATER	Does not retain water; very dry	Fresh; heavy rains bring floods	Dry	Available year-round
CROPS	Forest; pastureland	Corn; beans; fruit	Pastureland	Forest
ANIMALS	Livestock; horses	Swine; poultry	Horses	
WHO WORKS?	- The entire community - Women gather wood	Individual farm plots	Women and children tend to the animals	
WHAT WAS DONE BEFORE	There was more forest	Cassava and sweet potato were once grown	Fuelwood was gathered	There used to be more water

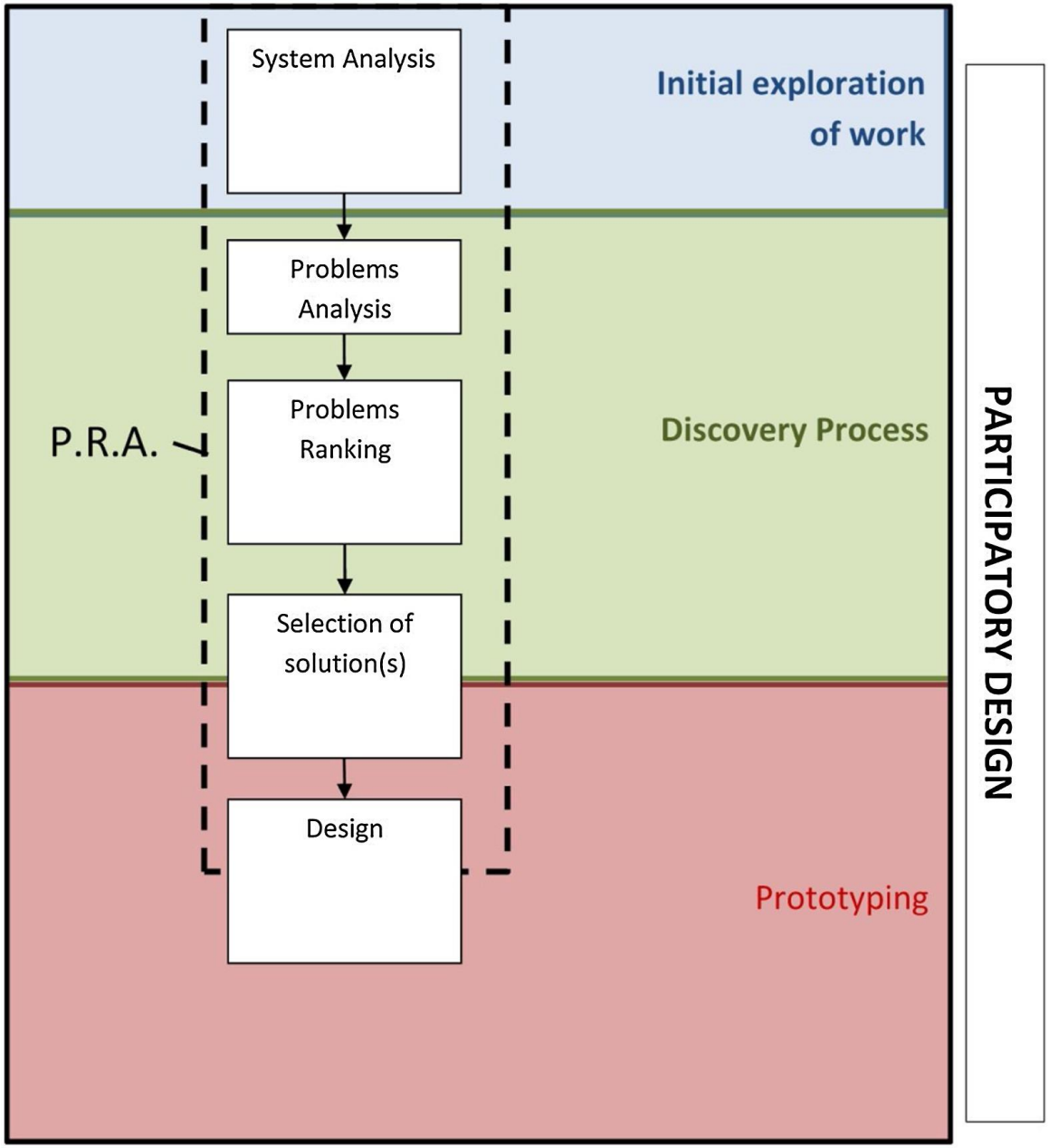
Transect walks

Research methodology: Participatory Design

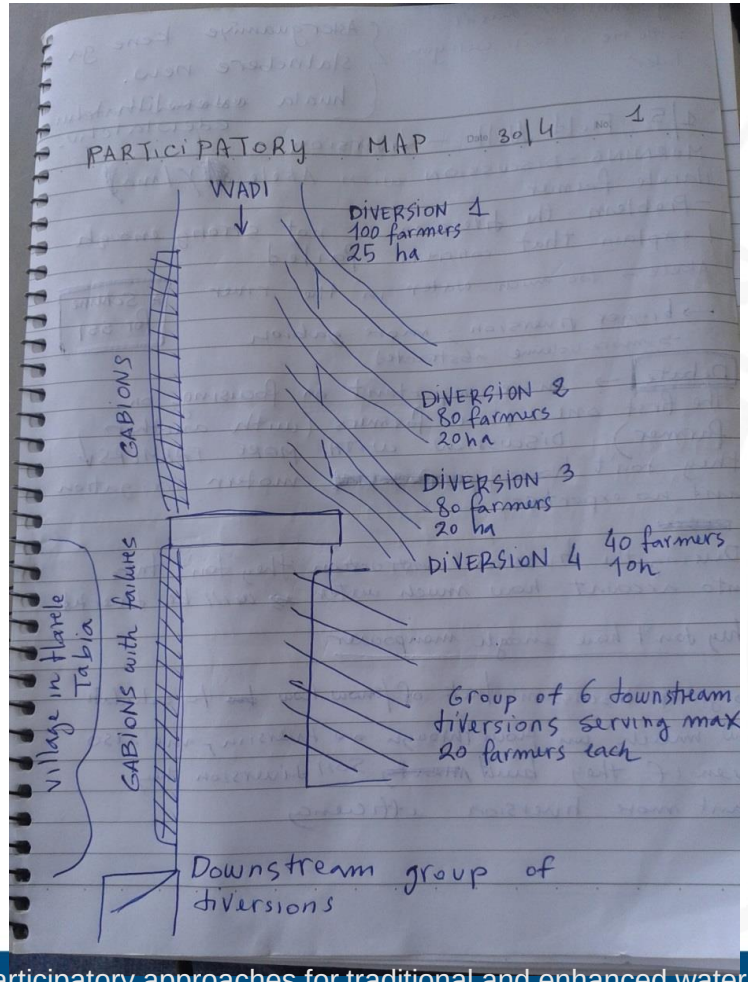
- ***Initial Exploration of Works:*** Everyday work and discussion (on **planning and technical aspects**) **->** PRA

- ***Discovery process:*** allowed establishing **objectives**, **parameters** and **criteria** for **design**

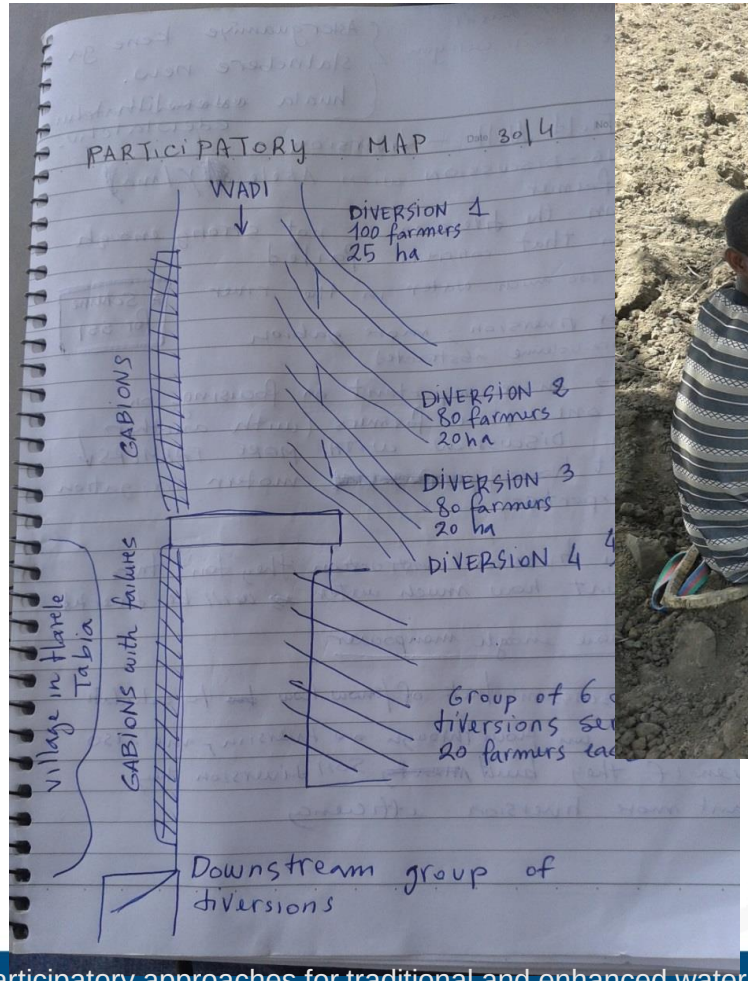
- ***Prototyping:*** Selection of design and materials taking into account **institutional agreements**, farmers' own **preferences** and possibility of **maintenance**


System Analysis
Problems Analysis
Problems Ranking
Selection of solution(s)
Design
P.R.A.
Initial exploration of work
Discovery Process
Prototyping
PARTICIPATORY DESIGN

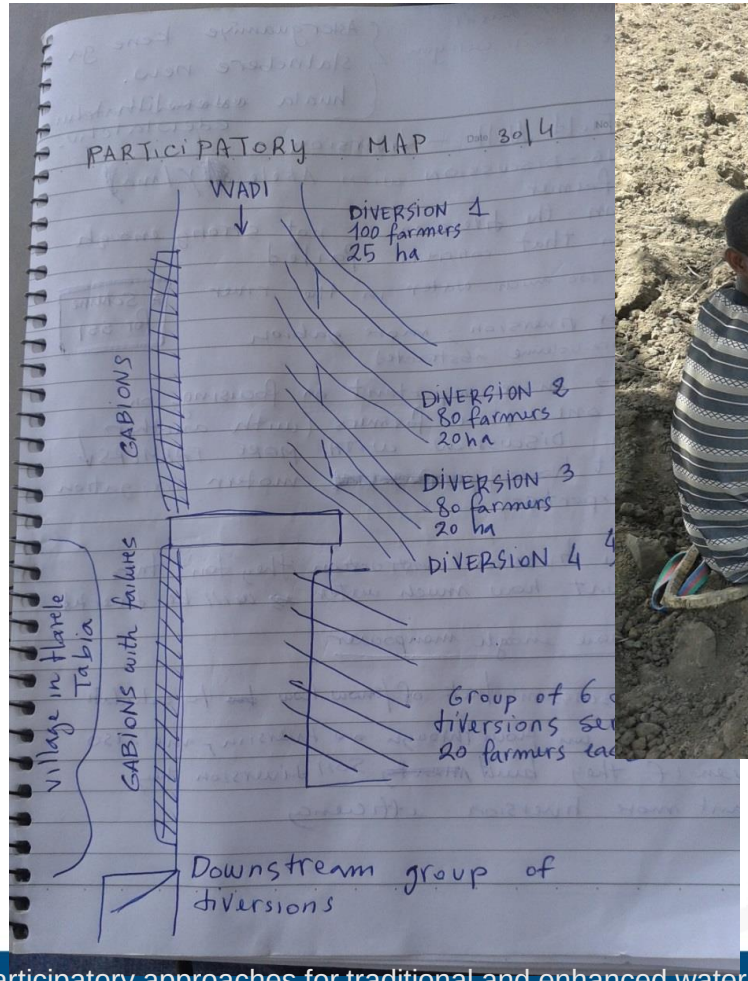
Participatory Rural Appraisal



Participatory Rural Appraisal



Participatory Rural Appraisal



Ranking of problems:

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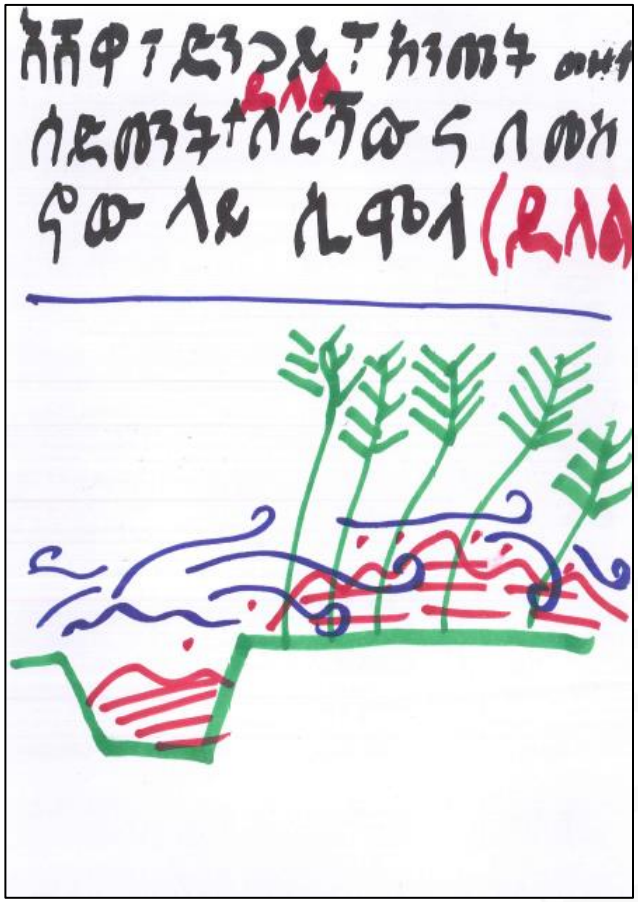


Ranking of problems:

1. **weakness of the diversion structures**
2. **lateral erosion**
3. flood risk for villages
4. flood risk for fields
5. size of the present diversion structures (too small) and low diversion efficiency
6. sedimentation
7. lack of manpower
8. lack of materials
9. presence of parasite plants and pests

Selected for the **design of solutions**

Flood - related problems

Participatory selection of solution and design

Participatory selection of solution and design

Participatory selection of solution and design

Design of diversion structures

Main problem emerged: diversions are usually washed away by floods, preventing irrigation practices. Maintenance and reconstruction works requires heavy burden for farmers

Farmers' input:

- The present shape of diversion structures is satisfactory
- Gabions are a suitable material
- Damages usually occur in the first part of the bund

Design procedure:

- Evaluation of the effect of local scour [Da Deppo and Datei (1999) - Richardson and Richardson (2007)]

- Check of the structural resistance to hydraulic shear stress [Bongio (2012)]

Hydrological analysis of extreme flood event carried out using local knowledge and information (slope – area analysis from hydraulic levels)

Design of gabion wall

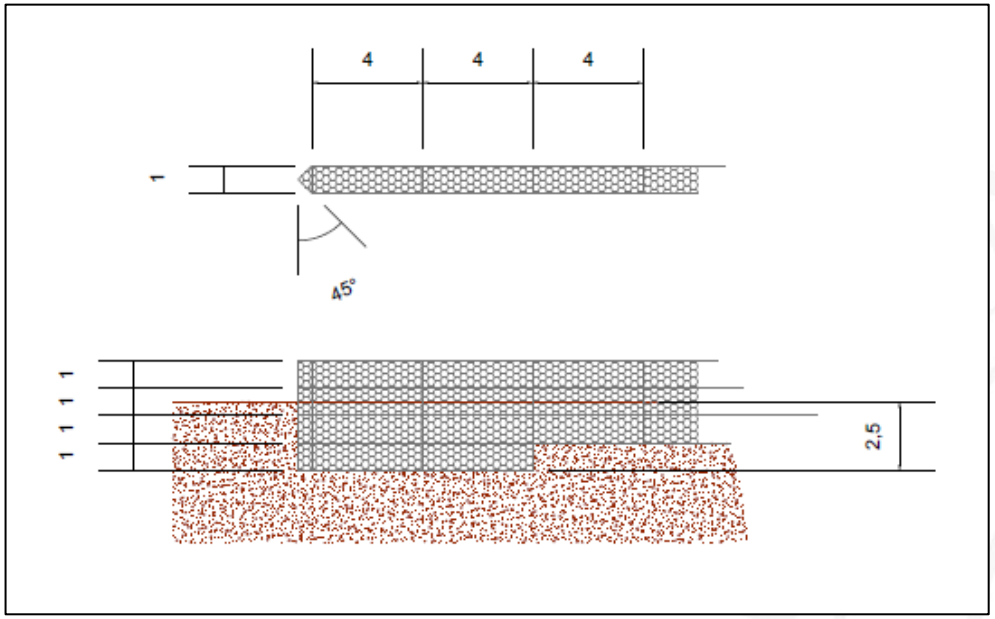
Main problem emerged: successive collapses of the river bank during floods reduce the cultivable area (average rate of 4.3 ha/y)

Farmers' input:

- Gabions are a suitable material
- All farmers perceived the problem (not only the ones owning land in the bank side)
- Flood- related problems are a heavy constraint for agricultural development

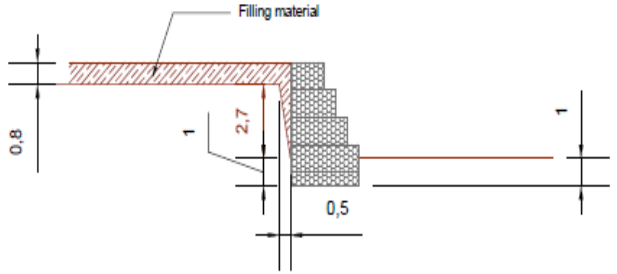
Design procedure:

- Stability checks using Maccaferri MACSTARS W software
- Evaluation of stability under maximum flood level within living memory

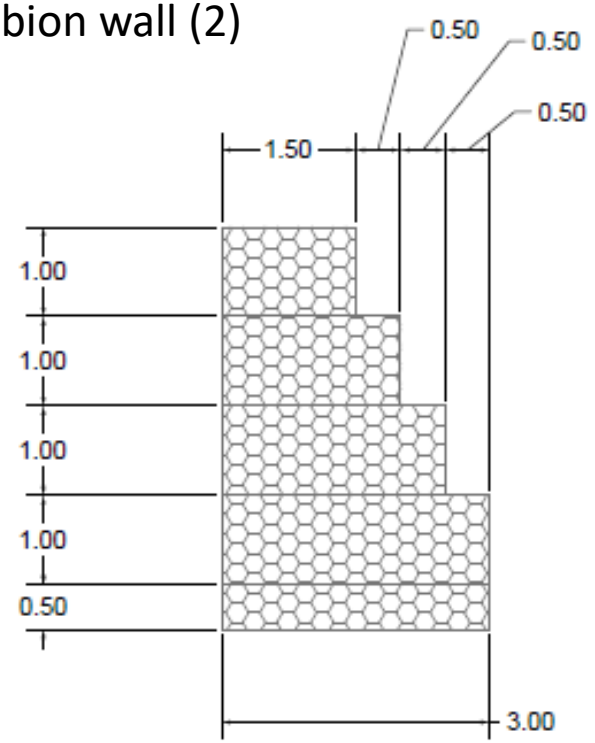


Diversion structures

Gabion wall (1)



Gabion wall (2)



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A participatory design approach for modernization of spate irrigation systems

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Participatory analysis of sustainable land and water management practices for integrated rural development in Myanmar

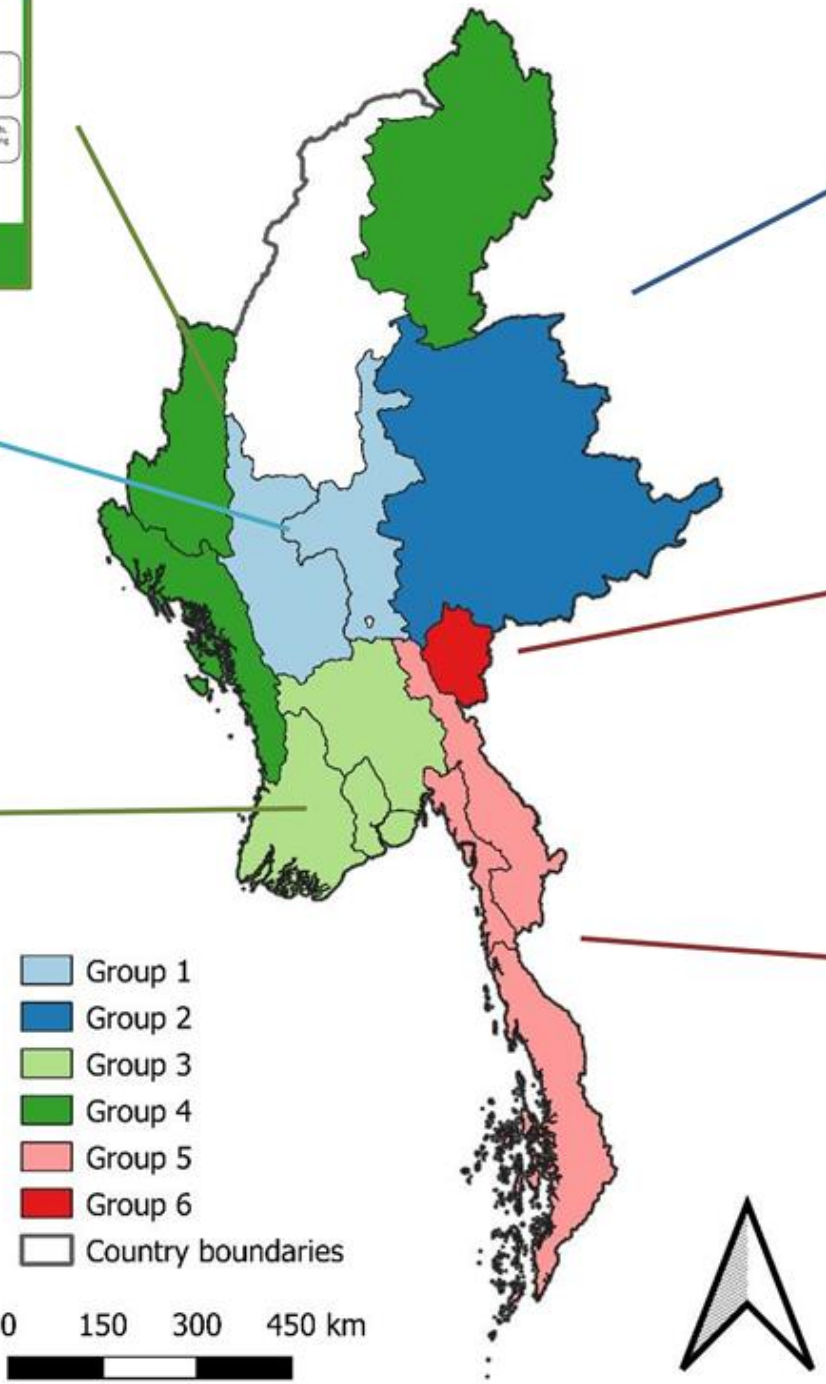
Myanmar:

- Water policy focus on large scale irrigation systems and urban water supply
- Rural water development neglected (**water supply**, **land and water management** and **water-related risks**)

Research Methodology

- Training course with officials of the **Department of Rural Development (DRD)**
- Group work to define **sustainable land and water management (SLWM)** practices to be implemented in **different geographic regions**

Lesson	Topics and main references
1	Driving forces, pressures, state, impacts and responses (DPSIR) framework (European Environmental Agency 1999); Ecosystem services (Costanza *et al.* 2017)
2	Introduction to sustainable water management; Integrated Water Resources Management (IWRM) (Global Water Partnership 2018)
3	Overview of climate change in Myanmar (Kreft & Eckstein 2014)
4	Sustainable groundwater development and management (IWMI 2015); DRASTIC methodology (US Environmental Protection Agency 1987)
5	Low cost supply methods for ground water development: Well protection and upgrading (Schneider 2014); Low cost pumping systems (Bresci *et al.* 2013)
6	Low cost supply methods for ground water development: sand dams (Maddrell & Neal 2013; Villani *et al.* 2018) and managed aquifer recharge (MAR) (Dillon *et al.* 2019)
7	Water safety plans (WSP) (WHO 2006; Rondi *et al.* 2015)
8	Low cost water and wastewater treatments (Collivignarelli *et al.* 2018)
9	Low cost rainwater harvesting technologies (Thomas & Martinson 2007; Mekdaschi Studer & Liniger 2013)
10	Soil and water conservation techniques (Liniger *et al.* 2007); Soil and water bioengineering (Petrone & Preti 2010)
11	Disaster risk reduction (UNISDR 2015)



Figures references:
Petrone & Preti, 2010
Twinomucunguzi et al., 2020;
https://www.flickr.com/photos/gtzecosan/5981896147

Participatory analysis of sustainable land and water management practices for integrated rural development in Myanmar

- **Water harvesting, Water Safety Plan and Soil Bioengineering** were recommended.
- Poorest regions have the **worst water management infrastructures**.
- The study can inform **future development projects** in rural Myanmar.

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Participatory analysis of sustainable land and water management practices for integrated rural development in Myanmar

Giulio Castelli ; Win Min Oo ; Andrea di Maggio ; Lorenzo Fellin ; Viviana Re ; Elena Bresci

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Conclusions and takeaways

- **Participatory research** is a tool that can provide **better quality decisions** in **water management**: When the k**nowledge of different actors, including experts**, is brought together and integrated during discourse, this can potentially lead to better informed decisions. In the examples:
  - It allowed **better design and management procedures for Ethiopia**
  - It disclosed **insights for rural Myanmar**
- Participatory research always stems from the **convergence of two perspectives**—that of science *and* of practice
- Numerous biases and issues can hamper the **results of participatory research** (e.g., **Myths of communities**). This is beyond this initial lesso, but the reference is: *Cleaver F (1999) Paradoxes of participation: questioning participatory approaches to development. J Int Dev 11: 597–612*

Ethiopia's Tigray conflict: Why the rest of the world is worried

3 days ago

Tigray crisis

Myanmar faces 'alarming' risk of civil war, UN says

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