



## Green Roads for Climate Resilience and Water Management

Tailor Made Training

Dhulikhel, Nepal

# Developing Guideline for Road-Side Spring Development and Protection



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# Guideline Development on Protecting and Developing Springs in Rural Road Development

The Guidelines are prepared by DoI with support of MetaMeta for the municipalities that work on rural roads in mountain regions.

Objectives:

- Preserve mountain aquifers
- Prevent road damage
- Create managed mountain springs – for drinking water or agriculture/ livestock

The Guidelines can be based on the forthcoming World Bank Guidelines on Green Roads for Water

They will be based on discussion with DoI and other experts and practioners – as part of the Tailor-Made-Training.



# **Guideline Development on Protecting and Developing Springs in Rural Road Development**

The Guidelines are envisaged to be short and practical and to consist of the following:

1. Foreword
2. Understanding mountain springs/ seeps and road development
3. Mountain aquifers: basics
4. Good practice in rural road development to avoid spring damage
5. Techniques for capturing and developing springs and seeps
6. Preventing road damage from springs and seeps



## **Group session:**

Working on preparation of “Guideline Development on Protecting and Developing Springs in Rural Road Development”



# Session 1 (plenary, everyone asked to contribute)

What is current experience?

- Examples on how road development affected the development of mountain springs
- Examples of (good) practice on spring development and spring protection
- Lessons learned on current situation
  - Strengths
  - Weaknesses
  - Opportunities
  - Threats



# Current situation

## Strenghts:

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## Weaknesses

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## Opportunities

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## Threats

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# Session 2 (Smaller groups looking at recommended practice)

What to recommend on the current improved techniques

- How to plan and engineer the road
  - Labour based construction?
  - Road development planning
  - Additional measures – what to do?



# Recommended good practices for roadside spring management

Spring Type	Description	Spring management
<b>Spring with concentrated discharge</b>	Not used	Retaining wall with weep holes or with longitudinal drain to collect excess water and traverse drains (French mattresses) underneath the road
	Used for agriculture	Retaining wall with longitudinal drain to collect excess water and traverse drains (French mattresses) underneath the road
	Used for domestic water supply	Spring box (captage) and conveyance to benefit community, or tap fitted on protected spring
	Used for domestic water supply and storage	Spring box (captage) and conveyance to benefit community. Include possibility of spring closure (tap) to store water inside the mountain aquifer (especially in karst areas)
	Not used	Develop road drainage in up-road section to collect seepage and convey to safe place
<b>Spring/ seep with diffuse discharge</b>	Used for agriculture	Use gravel section in road to convey water to agricultural land



# Session 3 (Smaller groups looking at recommended practice – then reporting back

- What to recommend on the proper process:
  - Road development by municipalities
  - Use of equipment and labour
  - Drinking water protection
  - Access to springs
  - Springshed protection
  - Use of basic information and data
  - Monitoring
  - More...



# Session 4 (plenary discussion)

## Uptake:

- How to reach municipalities? Whom to reach within the municipalities (road sections, water section,
- What should the Guidelines look like to reach municipalities? Do we need support material (posters, videos, etc)
- How to make sure that municipalities use the good practice?

## Next steps:

- How to complete the Guideline?