



Understanding the Spring Hydrogeology and Flow Dynamics for Water Security in Nepal’s Mid-Hills

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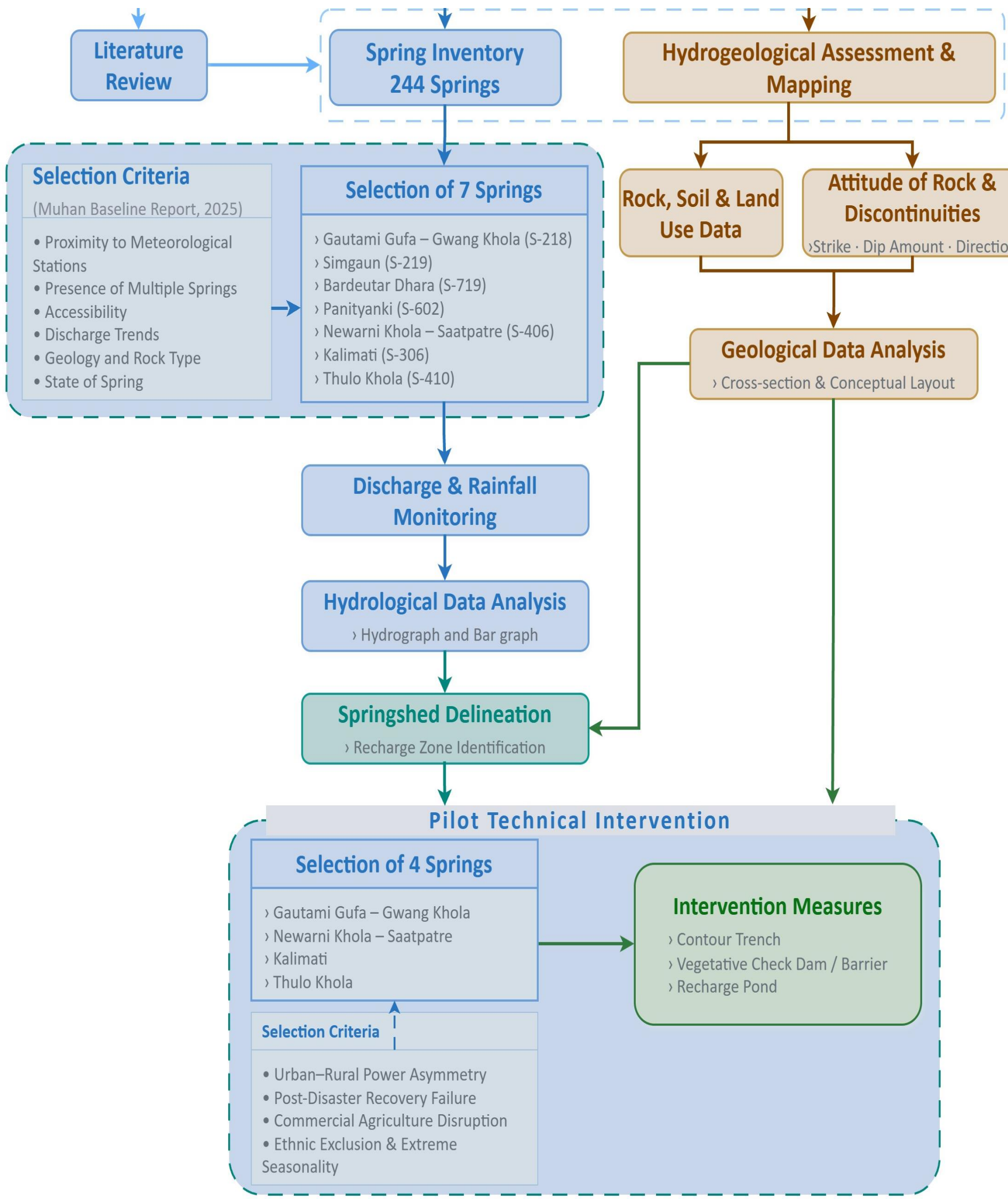
1 Introduction

In the mid-hills of Nepal, springs, locally known as ‘Muhan’ serve as the mainstay of life and livelihoods. Historically, rural communities have been using spring water for various purposes, such as domestic needs, irrigation, and livestock (Ghimire et al., 2019). Out of 13 million people living in the mid-hills, approximately 10.5 million (~80%) of the total population relies on spring water as their primary source of water (Tambe et al., 2012; Pokharel, 2019; Paudel & Duex, 2016). Despite their critical importance, spring water management related studies remain largely absent for most regions in the mid-hills (Shrestha et al., 2018).

This study adopts the springshed management approach for reviving drying springs (Shrestha et al., 2018) with initial results from the Sindhuli district. The study started by inventorying 244 springs (172 in Kamalamai Municipality and 72 in Sunkoshi Rural Municipality). Out of which, 7 priority springs are selected for detailed monitoring based on different bio-physical criteria.

3 Methodology

The overall methodology of the Muhan project is presented below. This presentation describes the key tasks performed and results of the springshed and recharge area delineation. The method focuses on identification of orientation of rocks and fractures in the catchments, preparation of geological cross sections and longitudinal sections and to delineate potential recharge areas of the springs, based on rock bedding/ discontinuity orientation. This will provide a scientific basis to design socio-technical solutions for springshed restoration.



5 Key Activities



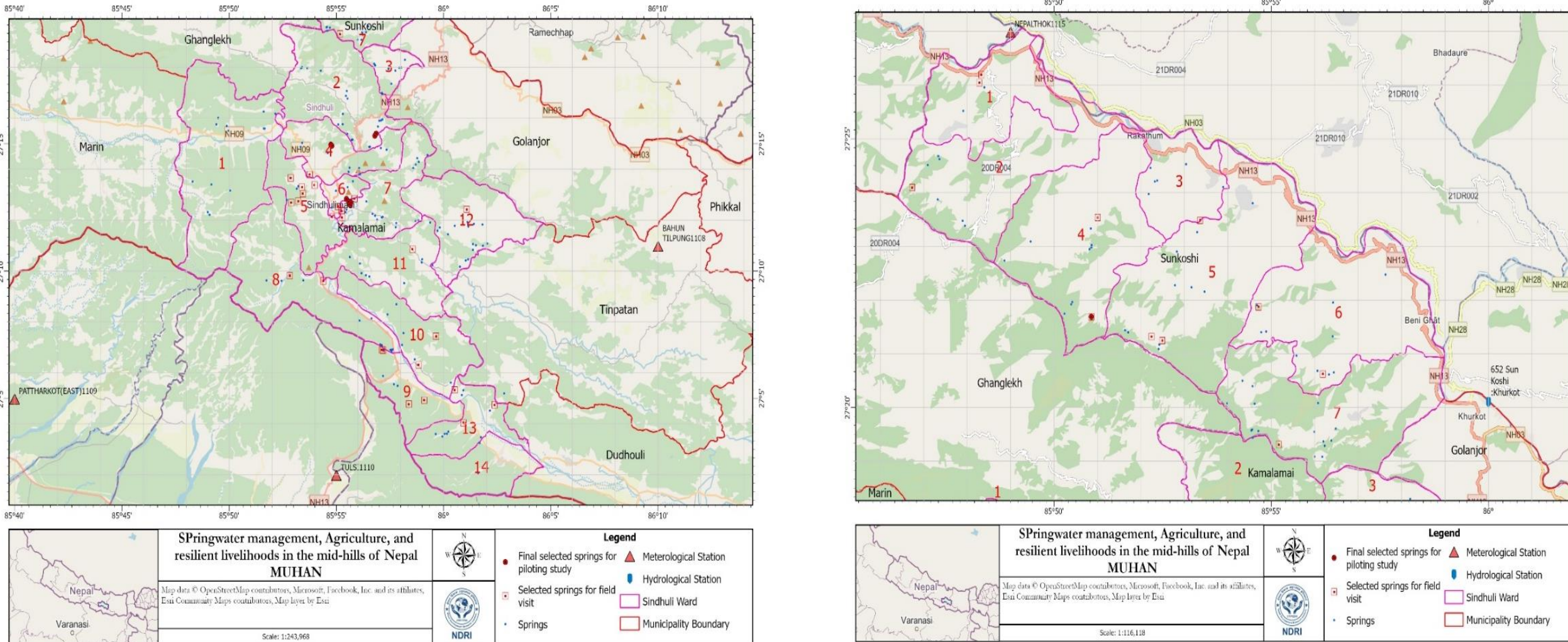
7 Way Forward

- Pilot different socio-technical interventions to enhance infiltration and groundwater recharge for sustainable use.
- Involve local government and communities in intervention implementation.

2 Objectives

This poster presentation aims to highlight the implication of field based hydrogeological mapping for the identification and delineation of potential recharge area (springshed) of the springs. This will provide the basis to pilot different socio-technical interventions for their revival in Kamalamai Municipality and Sunkoshi (Rural) Municipality of Sindhuli district.

4 Study Coverage

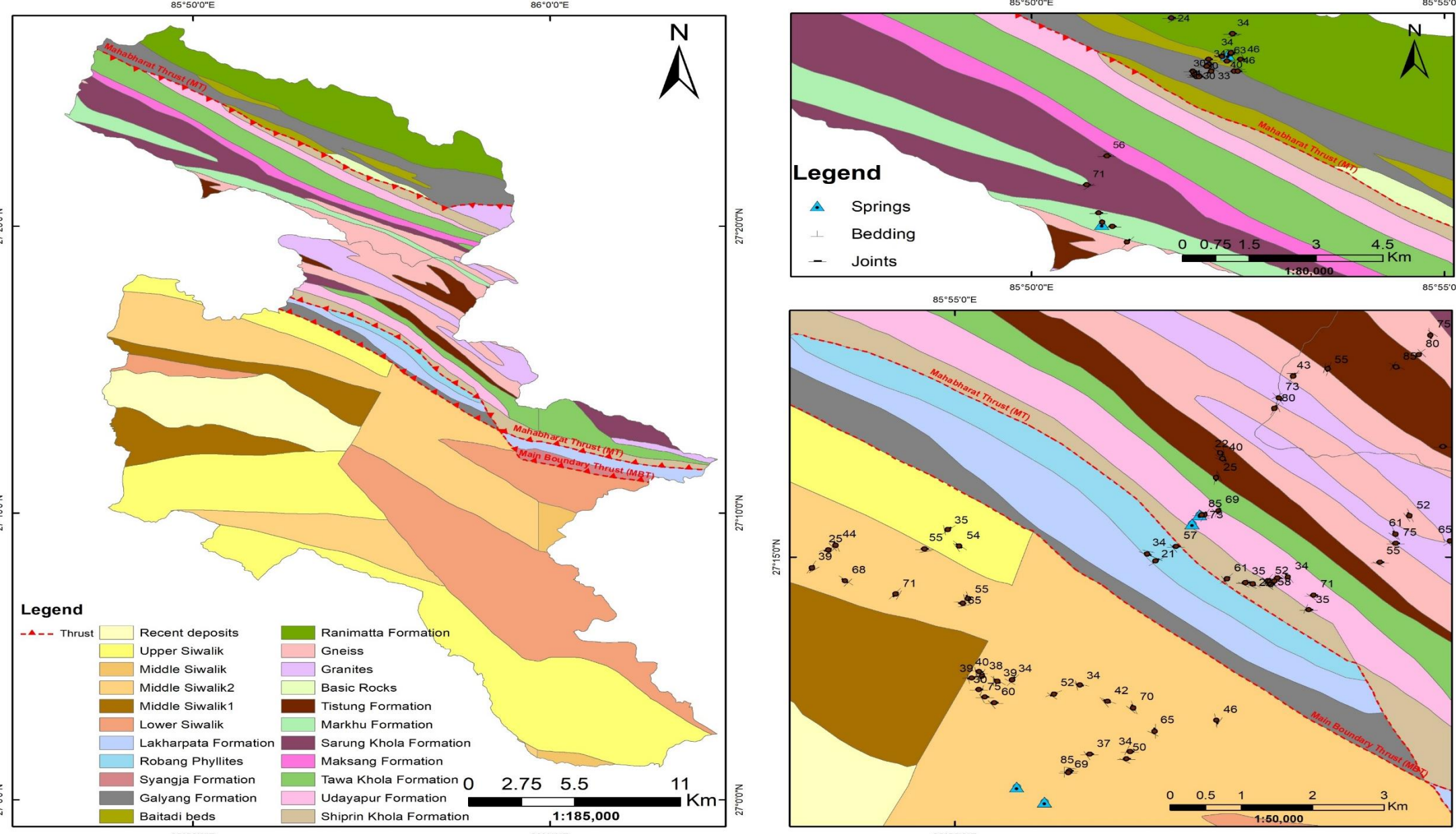


Study area

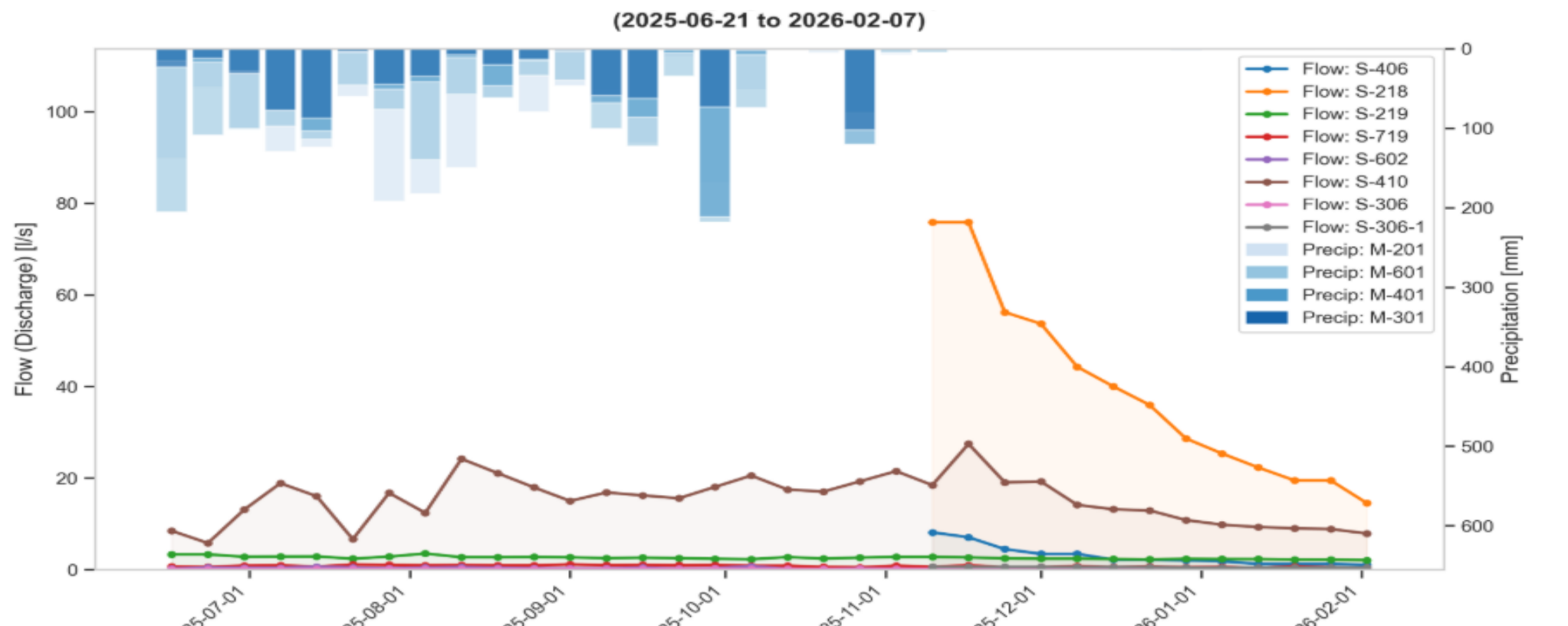
The study area lies in Kamalamai Municipality and Sunkoshi (Rural) Municipality within the Sindhuli District, Bagmati Province, Central Nepal, geographically distributed between 27.21°N to 27.41°N latitude and 85.85°E to 85.98°E longitude. A systematic spring inventory of 244 springs across the two municipalities was conducted and 7 different spring types (fractured, alluvial, colluvial, contact, depression, seepage and solution tubular) were documented. Geologically, the study area comprises of Siwalik rocks in the south and Lesser Himalaya (Nawakot and Kathmandu Complex) rocks in the northern region.

6 Key Observations and Findings

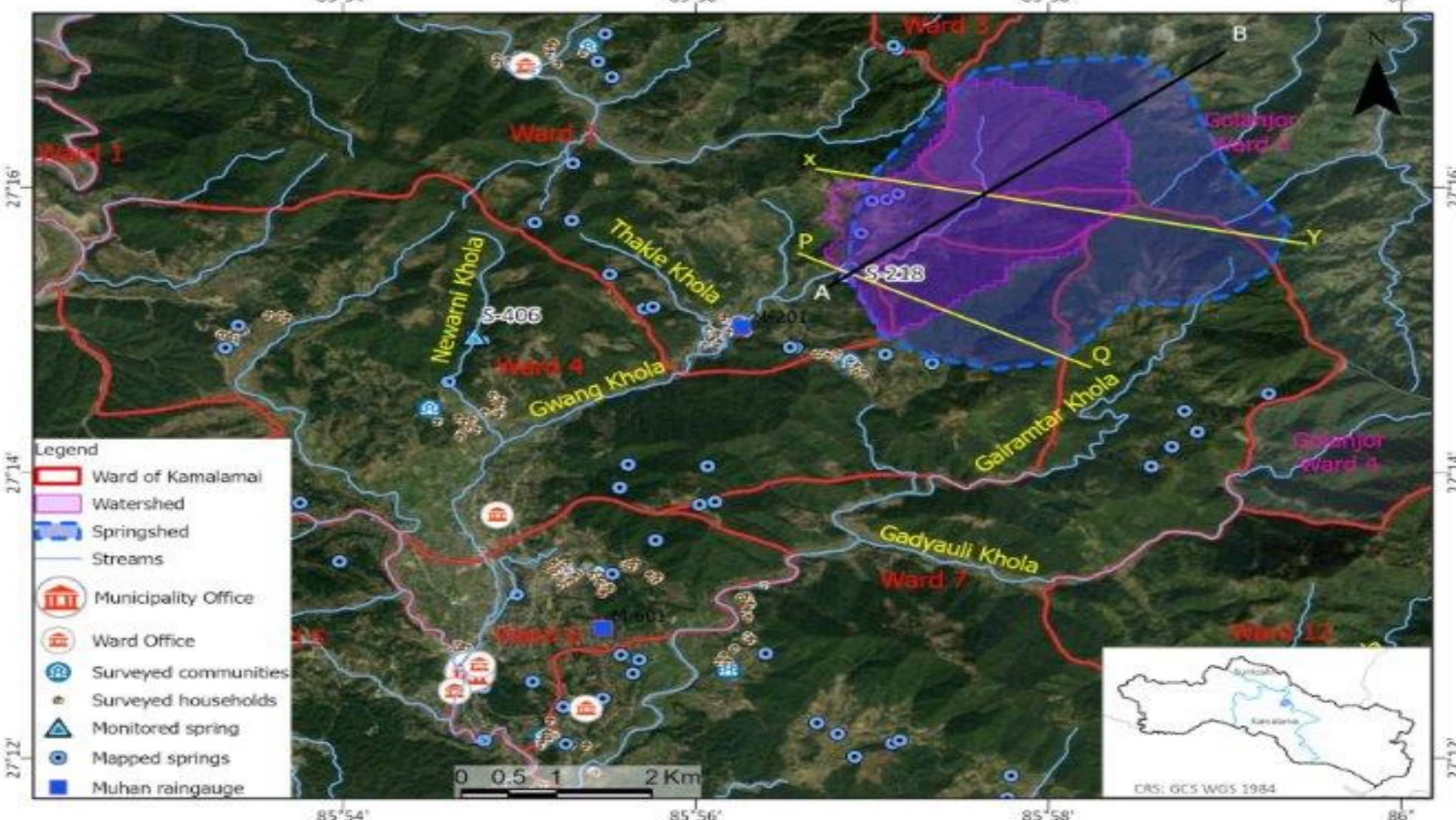
- Geologically, the mapped springs source lie in the Siwalik and Lesser Himalayan zone.
- Majority of spring sources have constant discharge over the monitoring period, with some spring showing decreasing trend.
- Spring recharge seems to be influenced by fracture networks rather than surface topography alone, highlighting the need for structural geological analysis over conventional watershed delineation.



Geology of the area



Spring discharge trend



Demarcation of potential springshed boundary

Acknowledgement:

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