

Impact of Water Source Depletion on Livelihood: Linkage with Chure–Kang River Basin

Abstract:

The direct implications of Chure Landscape on groundwater recharge, rampant population increase together with unplanned development activities has led to widespread deforestation. While the sudden discharge of water has caused other water-related problems which has resulted in - low agricultural productivity, massive flooding, and depletion of water resources, consequently imposing threats on the livelihood. This study examines the underlying cause of the Chure degradation by –analyzing the impact imposed by water resource depletion on the livelihood of local inhabitants. For this we using the data from questionnaire survey (n=200) and secondary sources including RS and GIS techniques. We found that out of 9 recharging spring sources 3 were active and others were dry. The forest cover was found decreasing by 4.3% in last 30 years (1990-2020). 38.0% of people are facing the problem of quality drinking water which made their living difficult. We argue deforestation as a major underlying cause of water source depletion with its key impact in the agricultural sector. -The study also discovers the presence of iron in a hand pump within a difference of only one hand, while the other remaining consistent. So, the study recommends a complementary study of underground geomorphology of water table along with immediate conservation initiatives.

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Introduction:

The direct implications of Chure Landscape on groundwater recharge, rampant population increase together with unplanned development activities has led to widespread deforestation. While the sudden discharge of water has caused other water-related problems which has resulted in -low agricultural productivity, massive flooding, and depletion of water resources, consequently imposing threats on the livelihood. This study examines the underlying cause of the Chure degradation by –analyzing the impact imposed by water resource depletion on the livelihood of local inhabitants.

Methods:

•For this we used the data from questionnaire survey (n=200) and secondary sources including RS and GIS techniques.

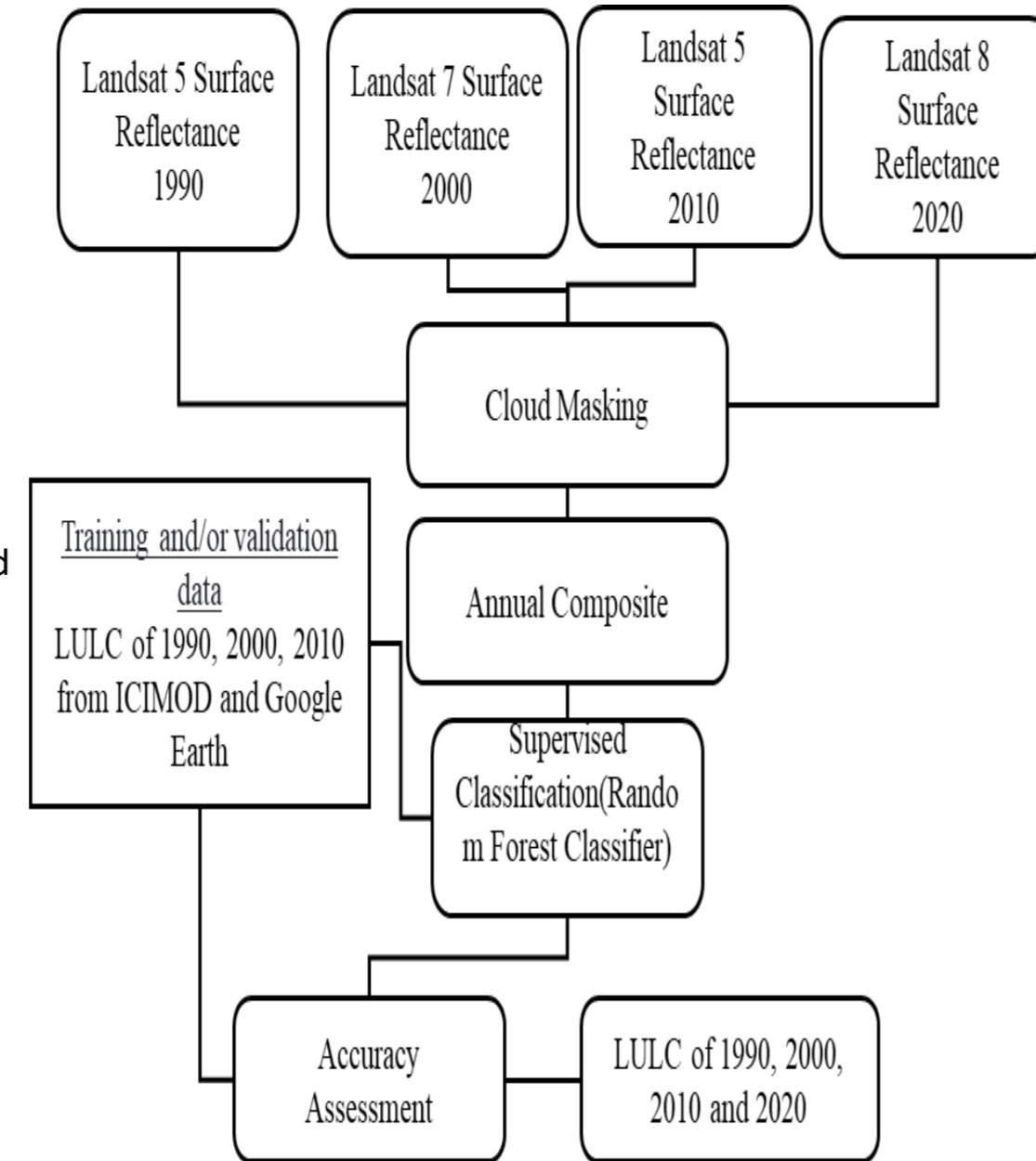


Fig.2: Flow chart summarizing the process for modeling the land use land cover change in Kang River Basin

Fig.3: a) Landsat 5 TM of 1990 Red: Band 4, Green: Band 3 and Blue: Band 2, b) Landsat 7 of 2000, c) Landsat 5 TM of 2010 Red: Band 4, Green: Band 3 and Blue: Band 2, and d) Landsat 8 false color composite Red: Band 5, Green: Band 4 and Blue: Band 3

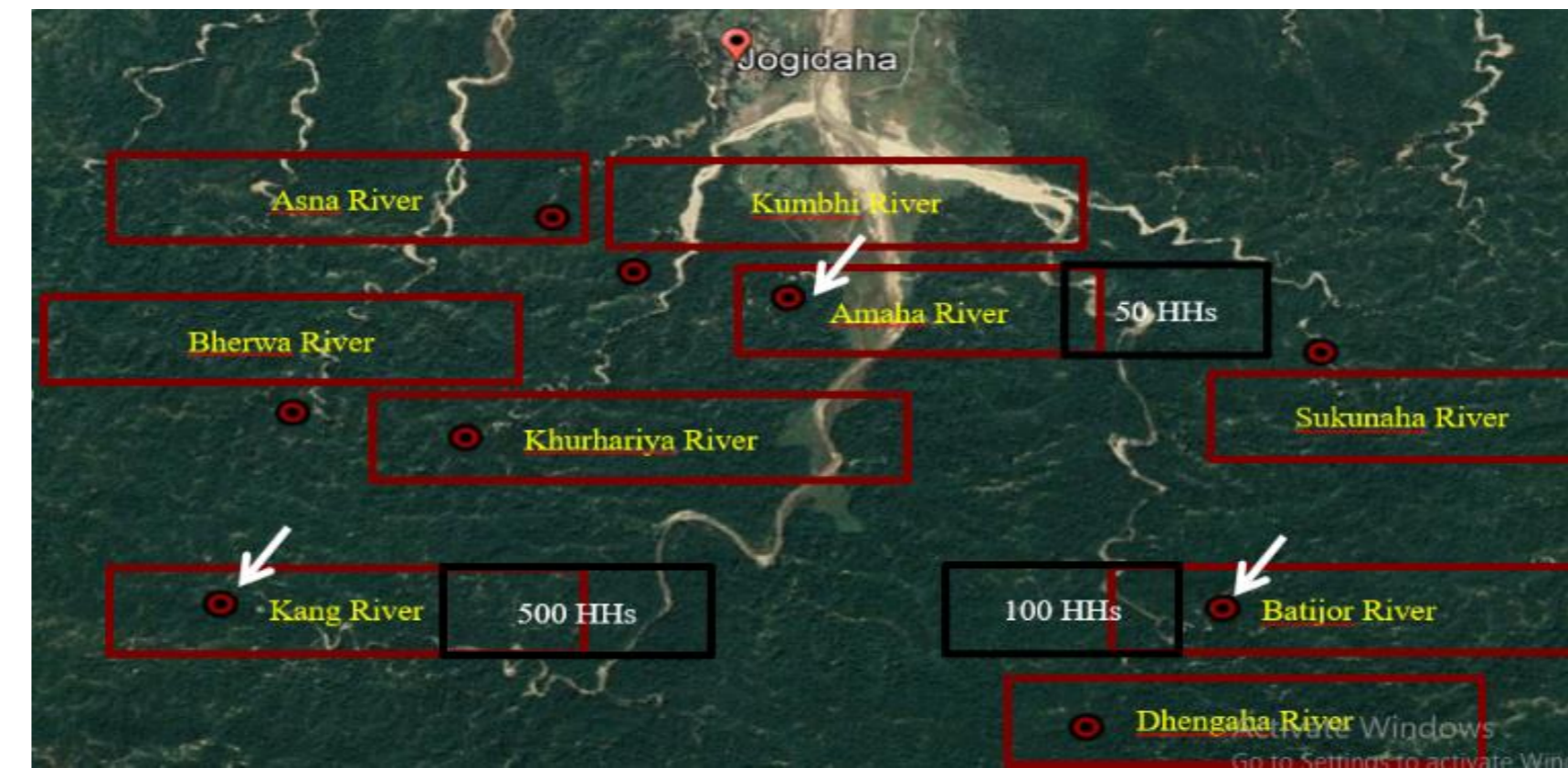


Fig.4: Status of spring sources and its spatial distribution

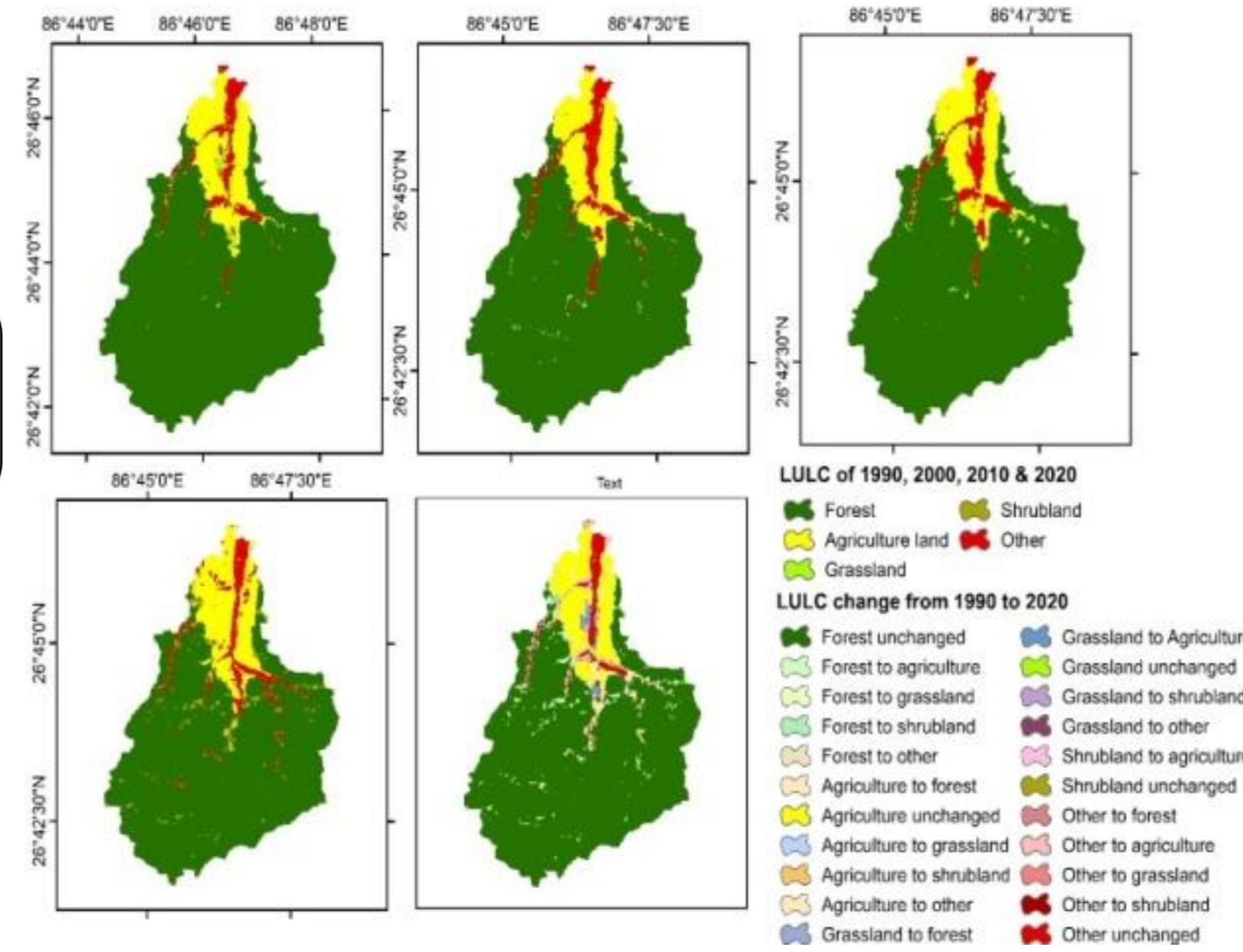


Fig.6: a) LULC(Land use land cover change) of 1990, b) LULC of 2000, c) LULC of 2010, d)LULC of 2020 and e) LULC change from 1990-2020

Discussion:

•Also, the average annual deforestation rate comes to 0.8%, comparatively lower than in Siraha and Saptari [4].
 •Similarly, it also proves deforestation as the main cause behind water source depletion which contradicts the report of FRA/DFRS in Ref. [3]
 •In terms of adequacy of the Kamala River water for drinking purposes, over 46.3 percent said that it was not fine for drinking at the moment [1, 2]. While here 38.0% people presented the declining rate of the drinking water problems in the area.

References:

[1] Ghimire, P. 2016. Chure Conservation Area: Lessons for the Management and Use of Natural and Biological Resources in Nepal. Case Study Report. Kathmandu. South Asia Watch on Trade, Economics & Environment (SAWTEE).
 [2] Gimire, P. 2016. A Study of Effect of Chure degradation on Water: a case of Kamala Basin in Nepal. South Asia Watch on Trade, Economics, and Environment (SAWTEE), Kathmandu, Nepal.
 [3] FRA/DFRS. 2014. Churia Forests of Nepal (2011 – 2013). Kathmandu: Forest Resource Assessment Nepal Project/ Department of Forest Research and Survey.
 [4] AGE. 1996. Prefeasibility Study of Churia Forest Development Project Nepal. Arbeitsgemeinschaft Entwicklungspolitischer GutachterInnen AGE, e. G. Association of Development Consultants (Coop.)

Results:

•We found that out of 9 recharging spring sources 3 were active and others were dry.
 •The forest cover was found decreasing by 4.3% in last 30 years (1990-2020).
 •38.0% of people are facing the problem of quality drinking water which made their living difficult.

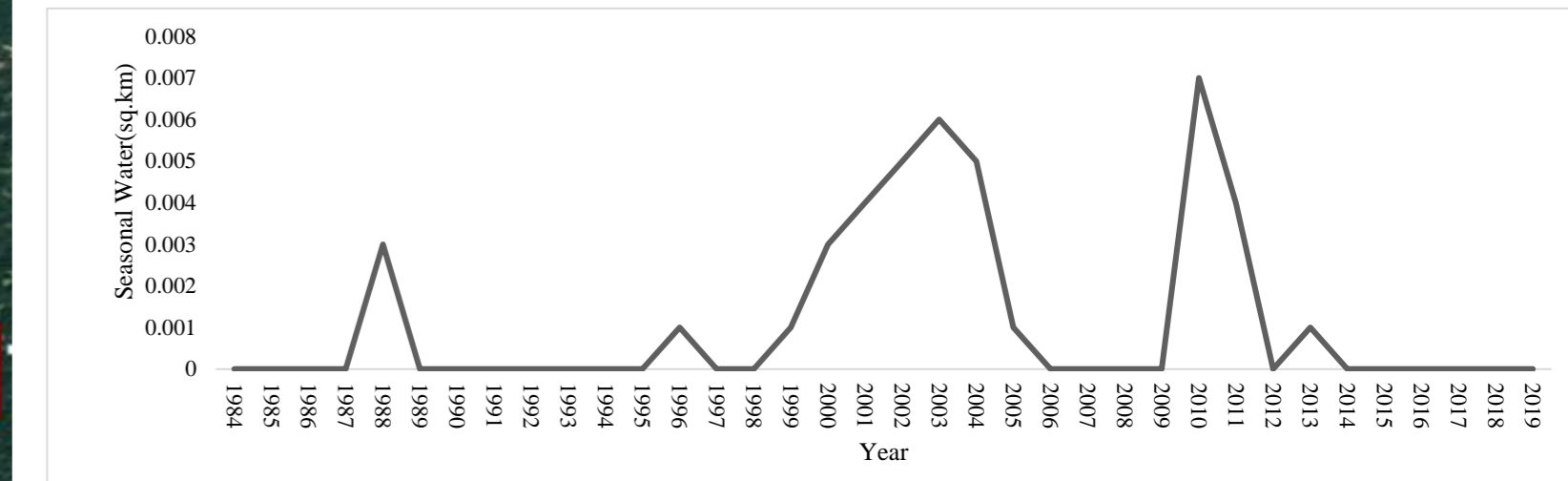


Fig.5: An illustration showing trend of extent (Sq. Km) of Seasonal Water in Kang Watershed

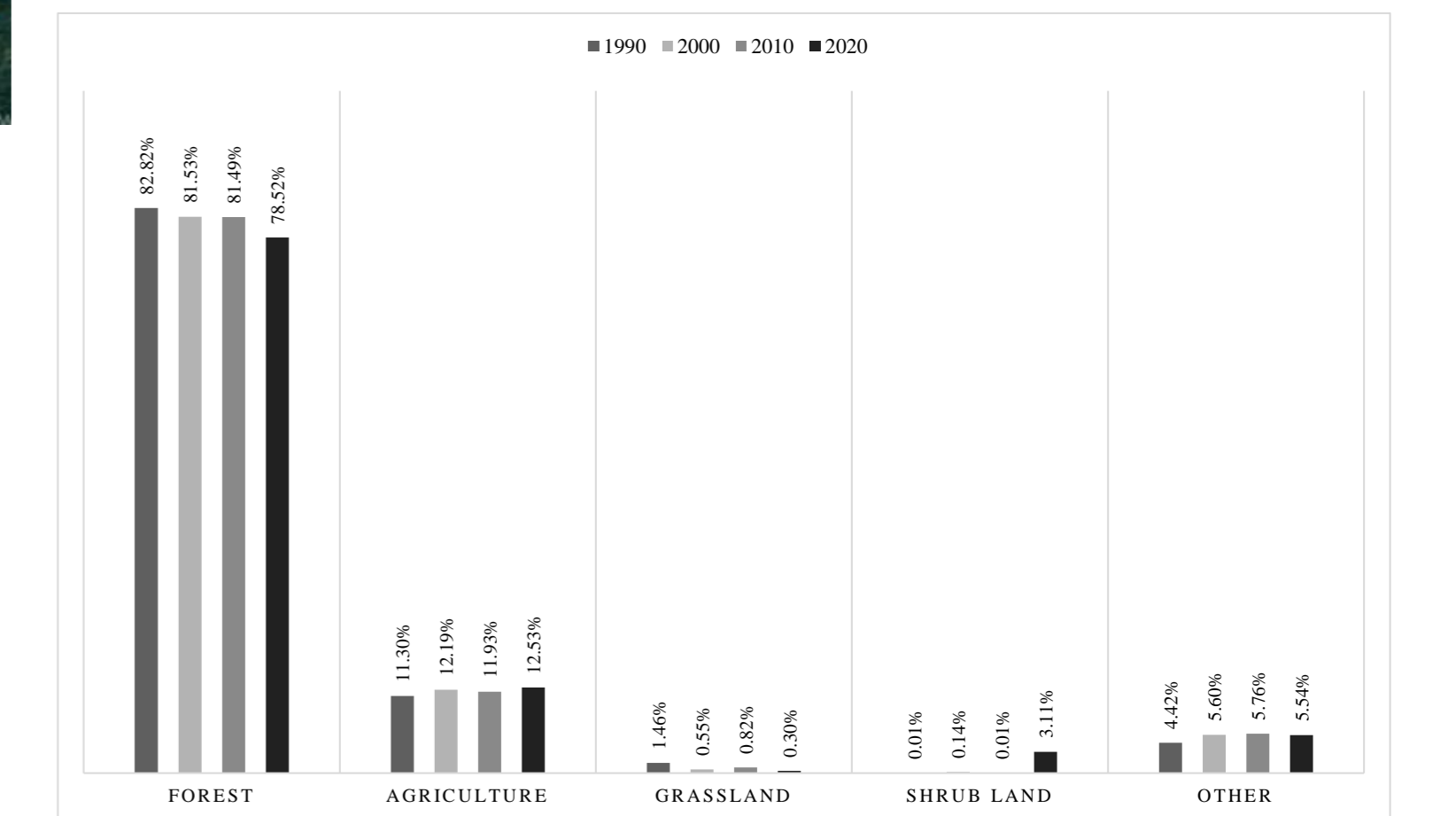


Fig.8: Bar graph showing temporal LULC of Kang Watershed.

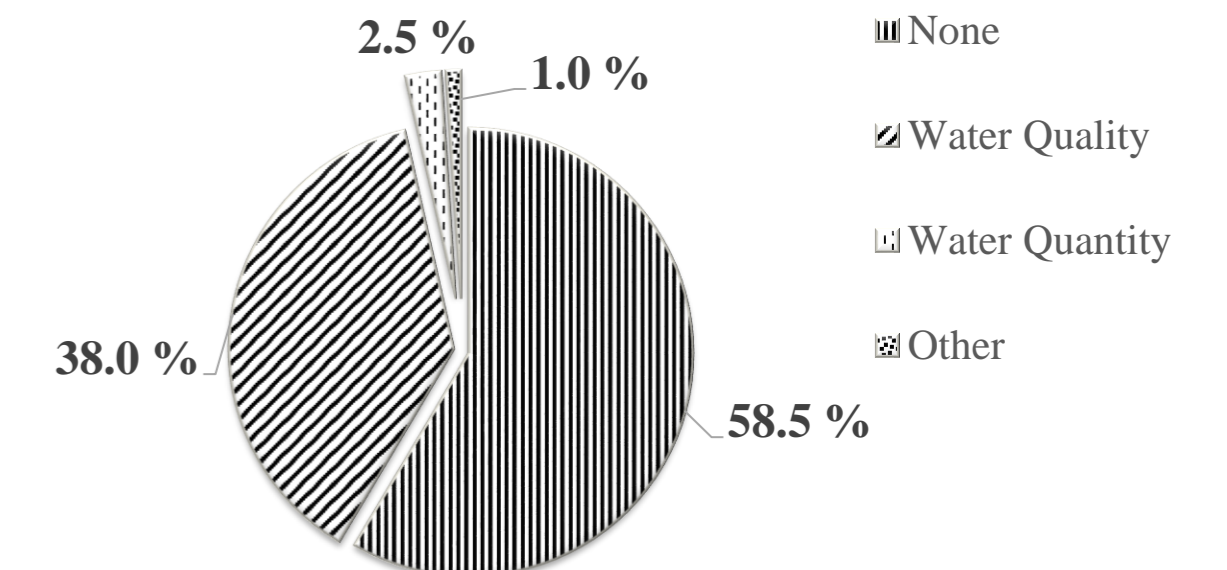


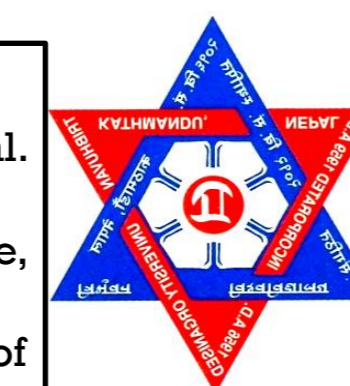
Fig.10: Difficulties mostly faced in drinking water

Conclusion:

•We argue deforestation as a major underlying cause of water source depletion with its key impact in the agricultural sector.
 •The study also discovers the presence of iron in a hand pump within a difference of only one hand, while the other remaining consistent.
 •So, the study recommends a complementary study of underground geomorphology of water table along with immediate conservation initiatives.

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