

Red Zoning Agricultural Areas and Red Listing Landraces for Stopping Loss of Agricultural Genetic Resources through Priority Conservation Work

Bal Krishna Joshi (joshibalak@yahoo.com), Krishna Hari Ghimire, Bharat Bhandari, Devendra Gauchan, Rita Gurung and Niranjana Pudasaini

Introduction

- Red zone is any areas where agricultural land is going turned to other uses, and native genetic resources are at risk of loss due to modern varieties, development works, natural disasters, etc.
- Red zoning is the process of identifying red zone in agricultural land
- Red list (also termed conservation status) is the list of crop species, and cultivars (varieties or landraces), prepared from the conservation aspects and considered trend of genetic erosion.
- The process of listing under red list categories is called red listing. Also includes rare and unique cultivars which are based upon the geographic range, habitat specificity, trait specificity and local population size.
- Important to determine the red zone, collection gap and red list status of crop landraces for setting priority attention for conservation as well as planning different types of actions for groups of landraces.



Identifying rare rice landrace in Lamjung

Objectives

- To prioritize the conservation areas and agricultural genetic resources
- To identify the farming areas that are at the edge of changing use pattern and map the red zone in farming areas
- To group the genetic resources based on the distribution and population size for accelerating conservation of rare, endangered and unique resources (red list)

Red Listing Agricultural Genetic Resources

- Red list is the name list of genetic resources (at genotype, landrace, variety, strain and breed levels) under different groups based on the analysis of distribution and population size (also called five cell analysis), and trait distribution. Red listing is the process of preparing the red list.
- Five Cell Analysis (Distribution and Population Size Analysis):** Landraces are grouped under five classes based on the distribution pattern and population size as well as based on the area coverage and number of farmers growing these particular landraces in a village.
- The distribution and population size of any landrace can be analyzed either by directly measuring the variables or organizing the focus group discussion (FGD).
- During listing, some genetic resources may not be listed under not evaluated cell if information is lacking.

Red Zoning Farming Areas

- There are major six factors that turn agricultural lands in to red zone (**Figure 1**). These factors include *ad hoc* distribution of modern varieties, heavy drought, disease and pests, natural disasters, migration of farmers after disasters, change in land use and commercialization.
- Red zone area is identified through the analysis on the degree of these factors in a particular site. Area coverage during analysis can be village, municipality, district, province or nation.
- Four approaches are used for red zoning. 1. Focus group discussion (FGD) and Key Informant Survey (KIS) are conducted to analyze the degree of these factors in the area coverage. 2. Report, news and social media are referred particularly for knowing natural calamities eg earthquake, drought, etc. 3. Interaction meeting with the developmental organizations (both governmental and non-governmental) particularly for locating mega project eg hydro electricity project, urbanization, new settlement, etc. 4. Collection gap analysis using Genebank passport data.

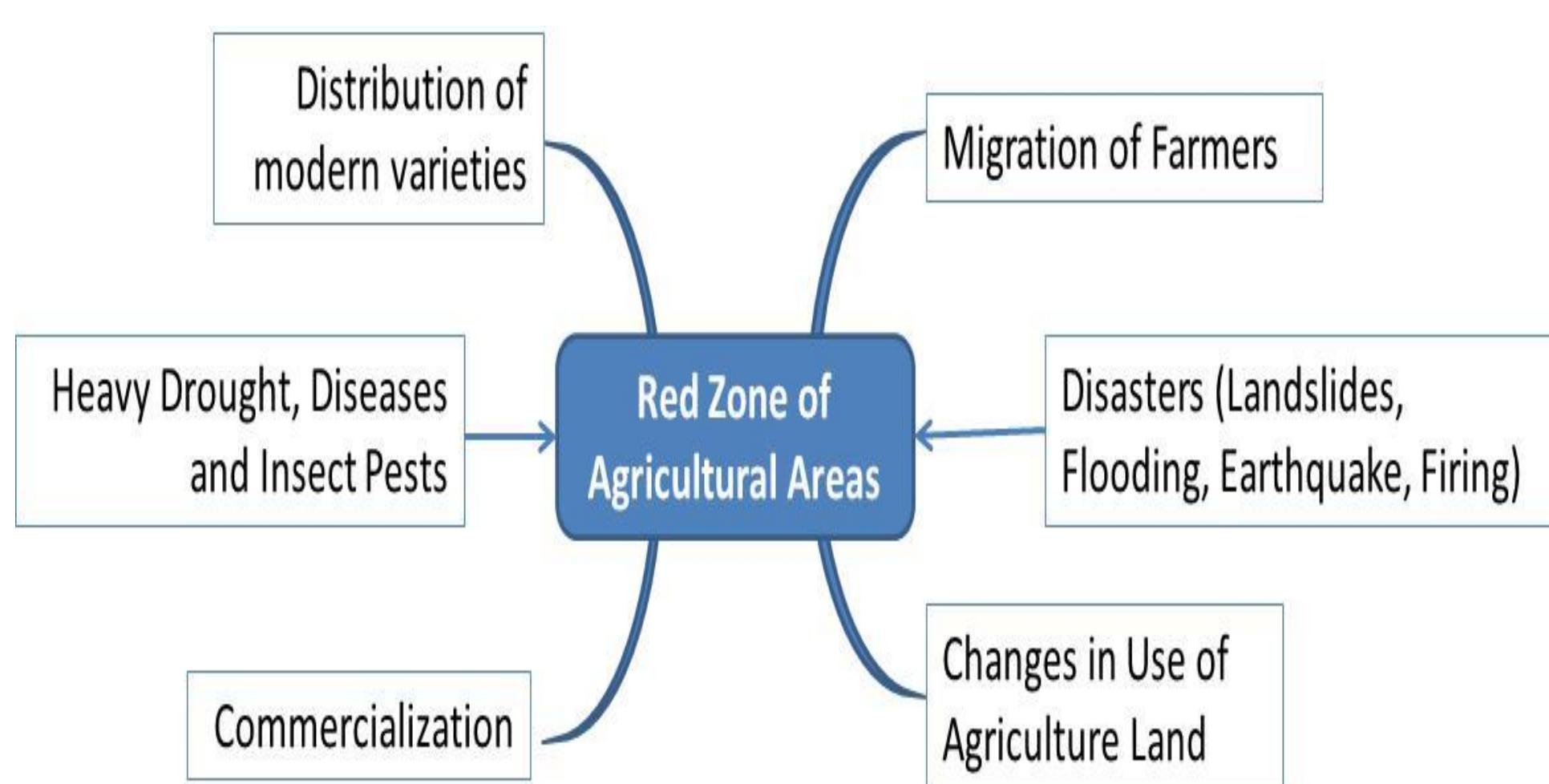


Figure 1. Factors that turn agricultural land to red zone (ie area where crop landraces become endangered).



Red zone due to Budhi Gandaki Hydroelectric Project

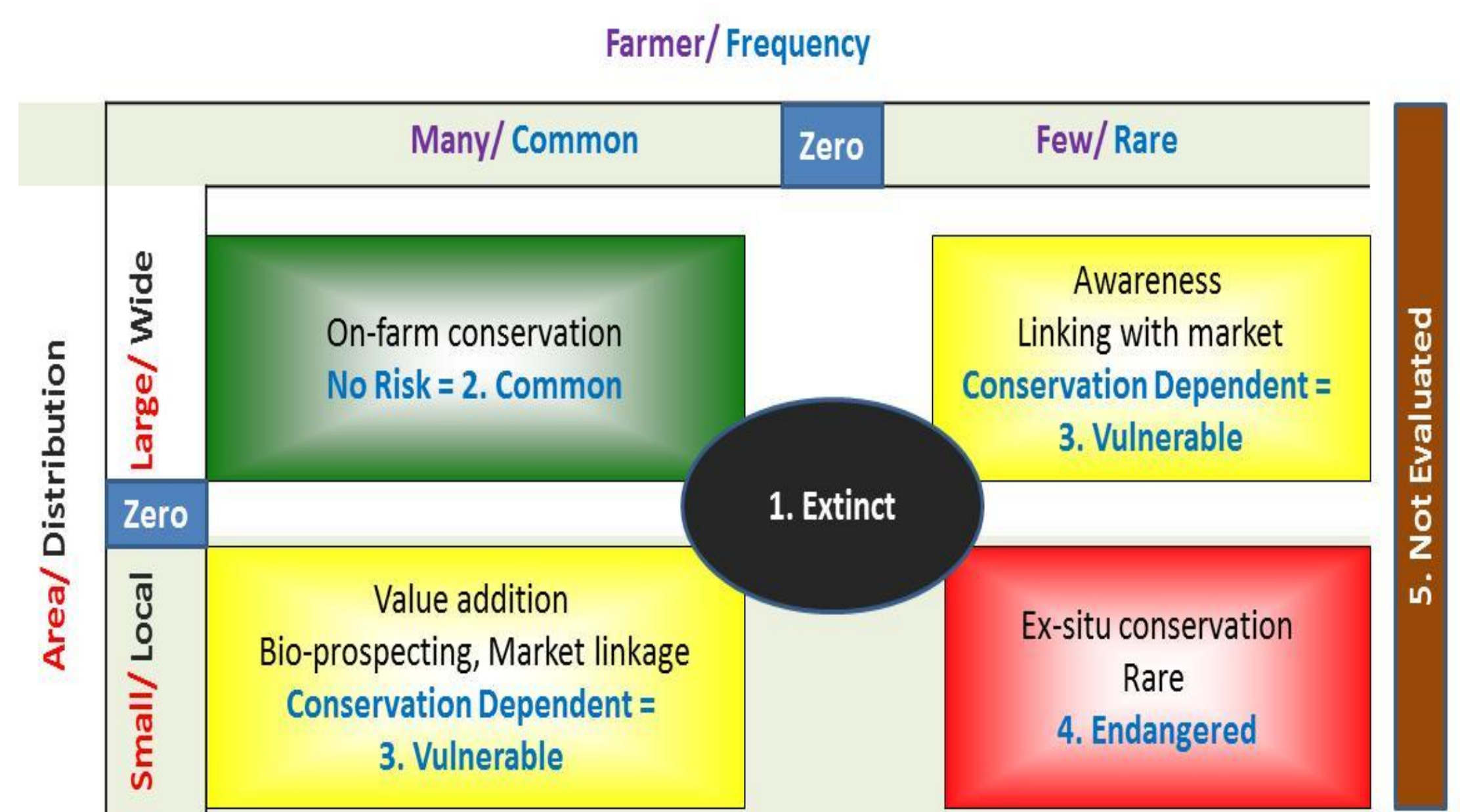


Figure 2. Categorization of crop landraces based on the distribution and population size.



Examples

- Through red zoning, collection gap analysis and red listing, more than 1000 landraces of more than 20 crop species have been listed, collected, rescued and conserved.
- This good practice is exercised 250 times in 30 districts involving 1000 farmers and 100 officials.
- Farming areas in earthquake affected districts (Lamjung, Gorkha, Dolakha) are red zones. Urban areas eg Simikot, Humla and Bijayanagar, Jumla are also red zones.

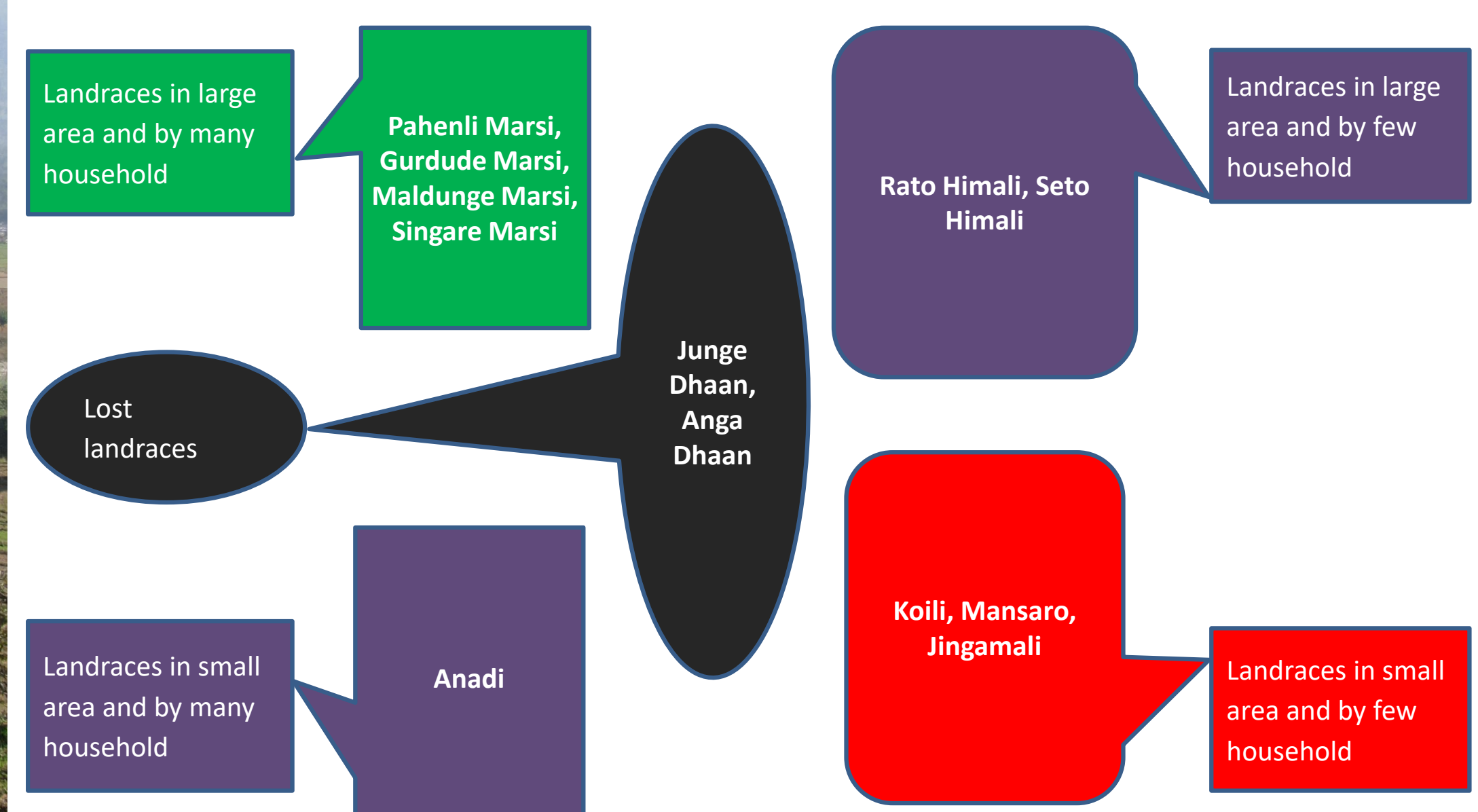


Figure 3. Some examples of five cell analysis.