Sustainability of harvest of commercially threatened medicinal plant *Aconitum spicatum* (Briihl) Stapf in central Nepal

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Introduction

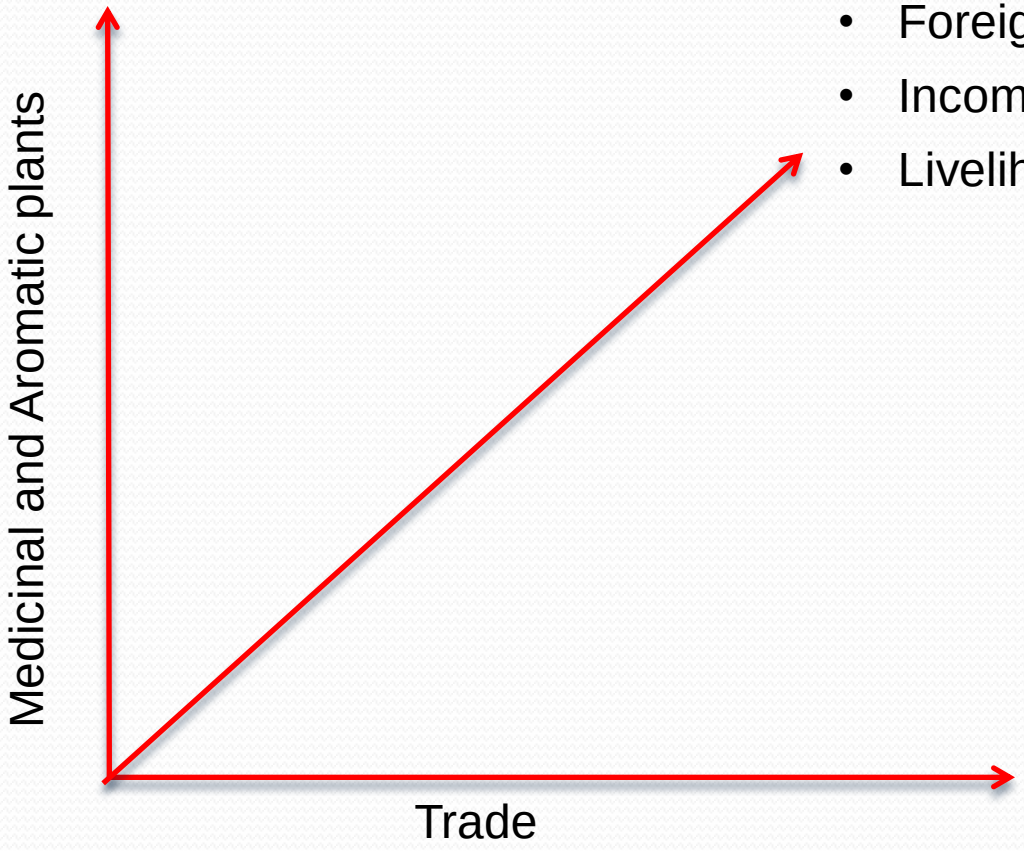
- Nepal harbors >2,000 species of non timber forest products (NTFPs) of which 90% are medicinal & aromatic plants (MAPs)
- More than 100 species of MAPs are traded commercially
- MAPs have been identified as one of the 19 goods by Nepal Trade Integration Strategy, 2010 as having export potential

Ophiocordyceps sinensis

Fritillaria cirrhosa

Aconitum spicatum

MAPs & Trade relationship



Economic Prosperity

- Foreign trade and exchange
- Income and employment
- Livelihood improvement of people

Source: IUCN

- 33 MAPs identified by the government of Nepal for commercial farming

Major threats and challenges on sustainable uses of MAPs

- Illegal harvesting and trade
- Premature and overharvesting
- Inadequate awareness about the species biology and sustainability
- Over grazing and other human disturbances
- Lack of science-based management

- As a result, population of many species of MAPs declining, reproduction and growth rate reduced, and community composition and ecosystem is also changing

Study MAP species

Aconitum spicatum

Status: Vulnerable species

Habit: Perennial herb

Parts use: Tubers

Habitat: Moist places at 3000-4300 m

Regeneration: Tubers and seeds.

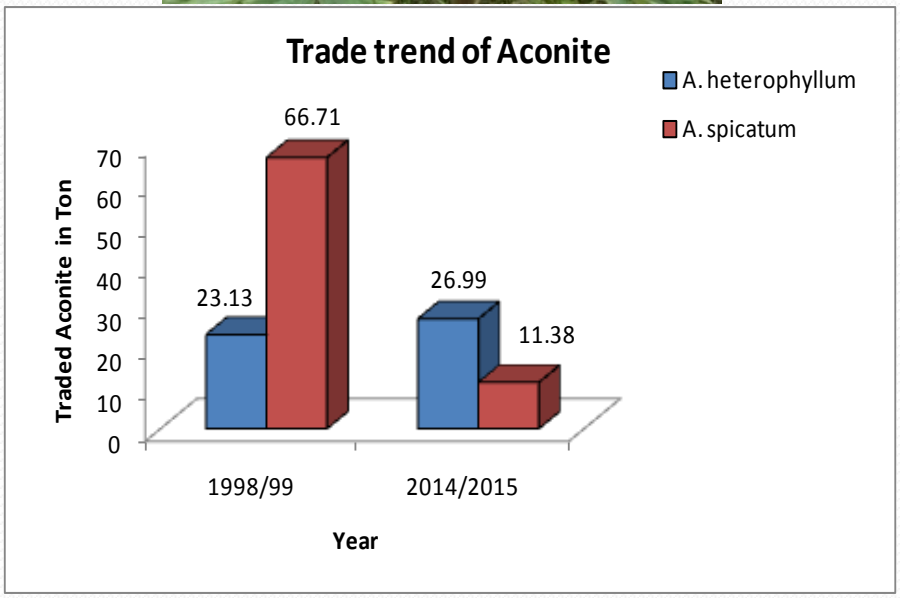
Use: Highly poisonous, medicinal

Local medicinal use – Cuts and wounds fever, headache, lung and intestine infections and cough

Allopathic Use :Analgesic and antipyretic

Prioritized by the government of Nepal for economic development

Trade: In decreasing order and approx 100% of the harvested tuber is traded to India



Source: Olsen 2005,TGGN 2016

Objectives

Broader objective:

To develop a sustainable harvesting model and management guidelines of *Aconitum spicatum*

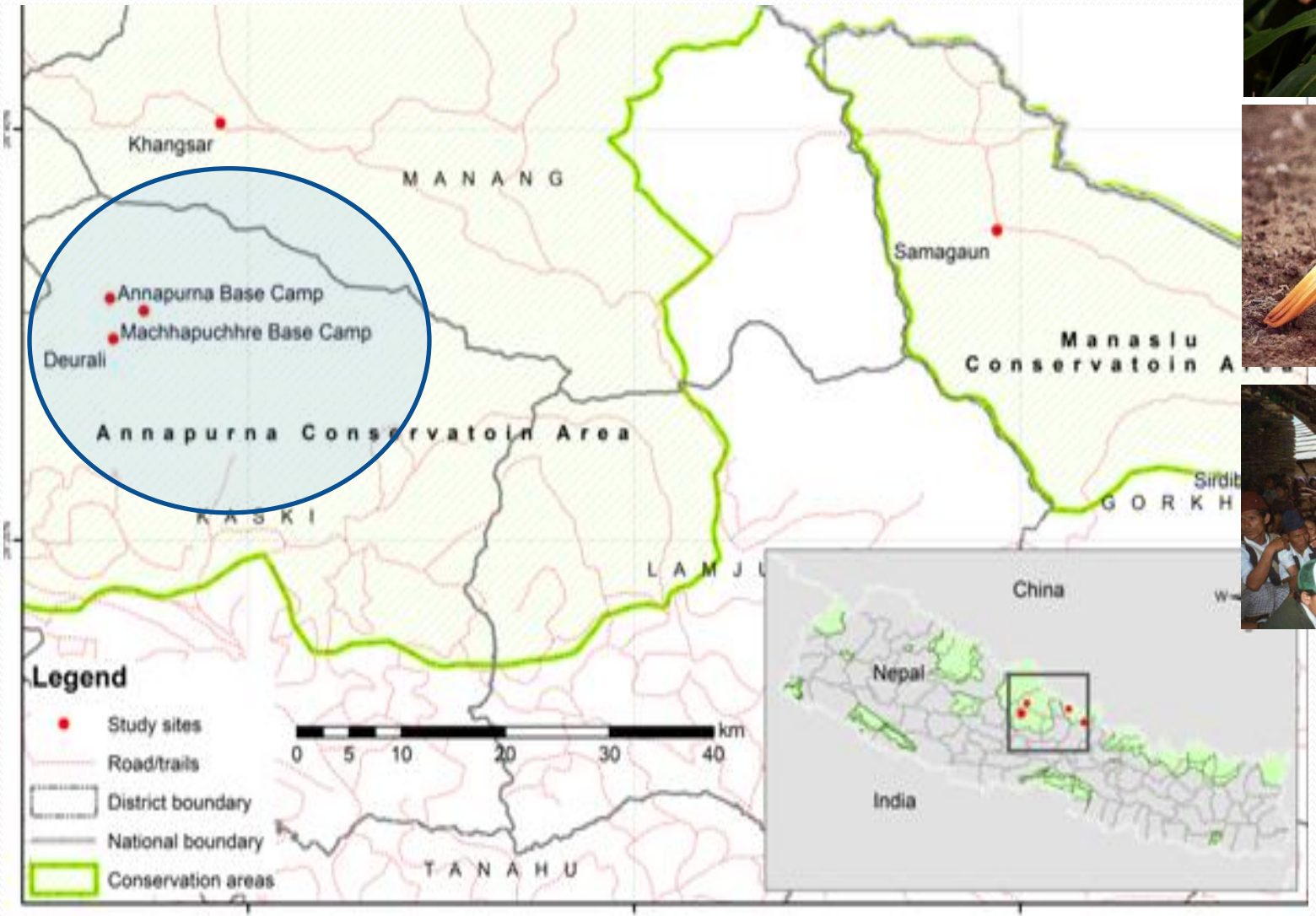
Specifically:

a. To assess the variation of life history traits along the altitudinal gradient

b. To assess the effect different levels of harvesting treatments on the life history traits along an altitudinal gradient

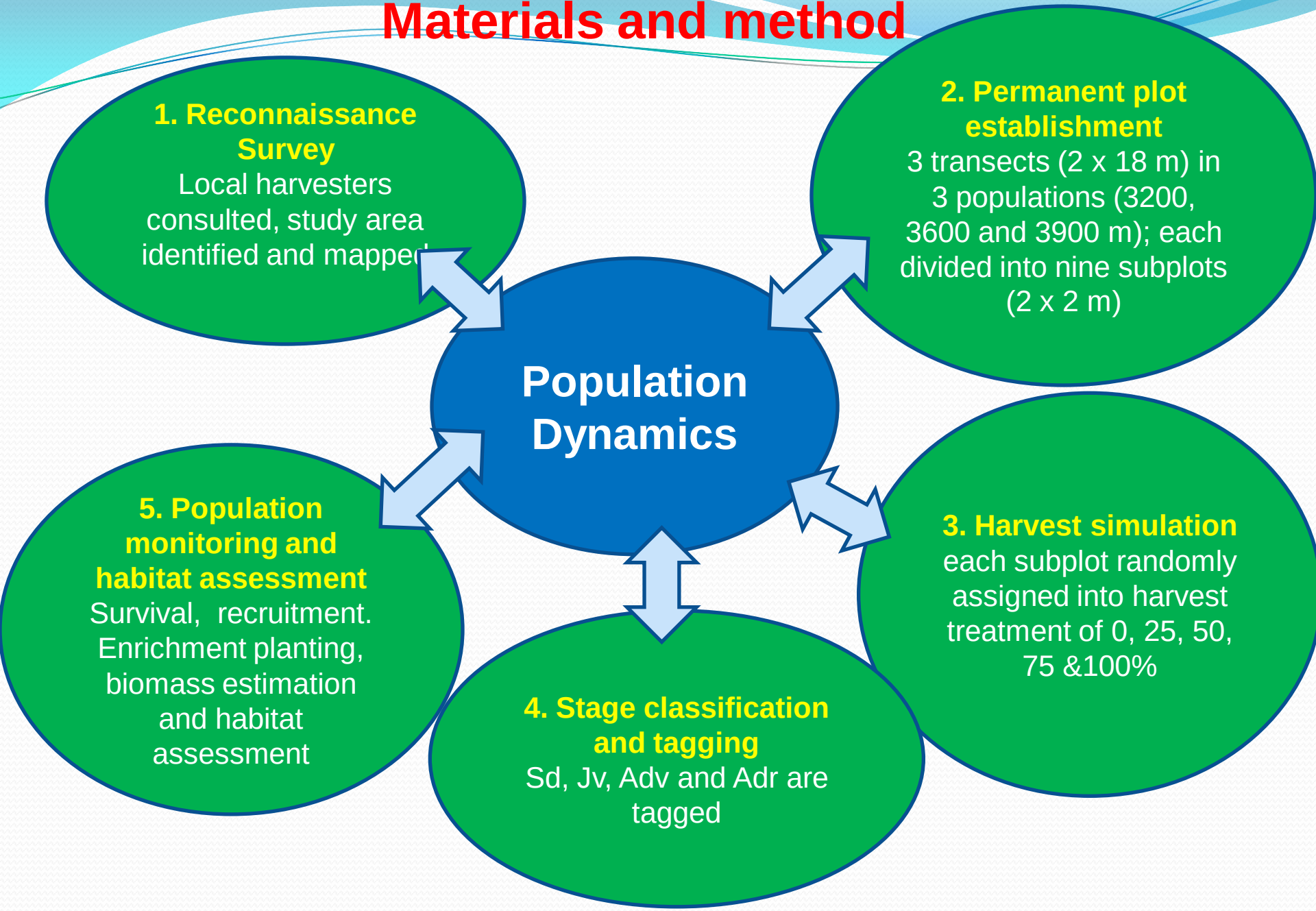
Study site

Annapurna Conservation Area (ACA)

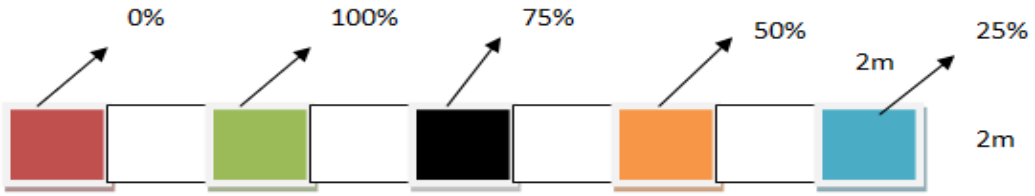


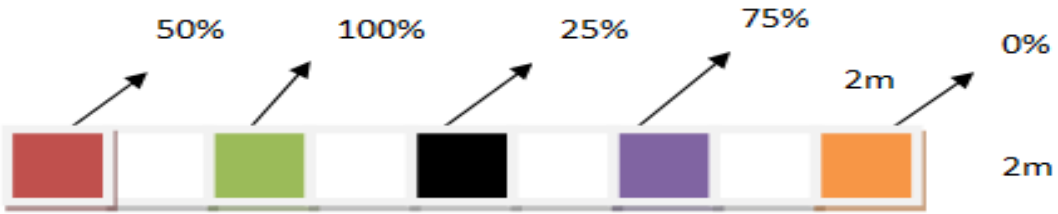
Source: ACAP 2014

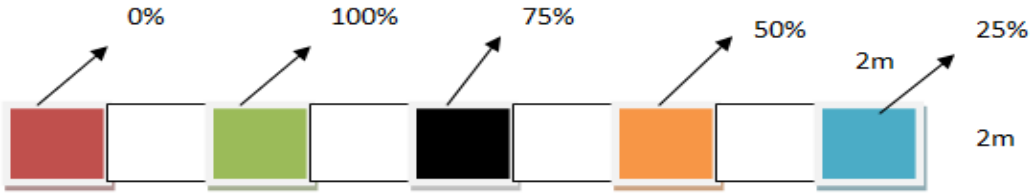
Materials and method



Sampling design *(Aconitum Spicatum)*: (belt transect)



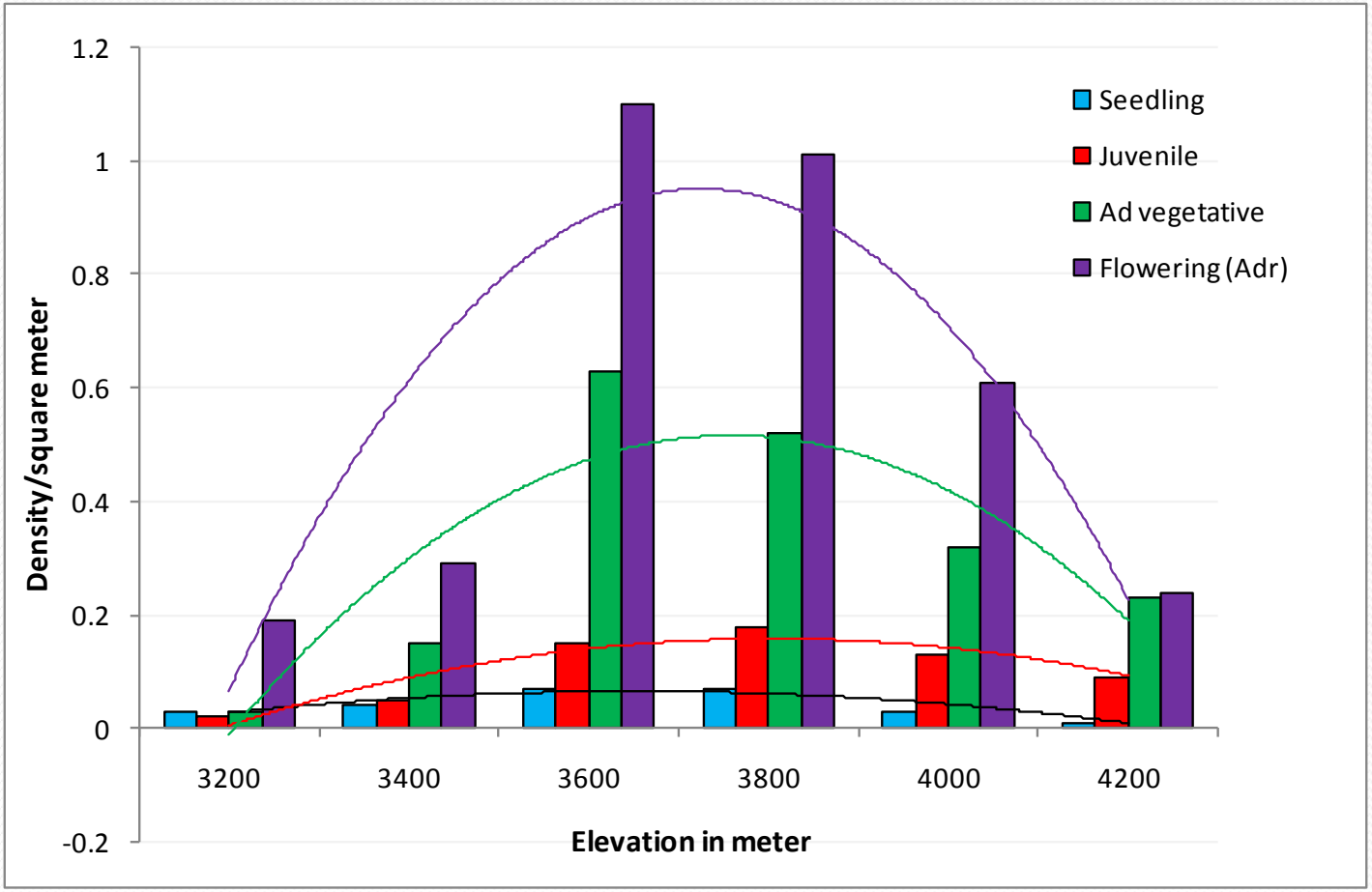




Some snaps of field work

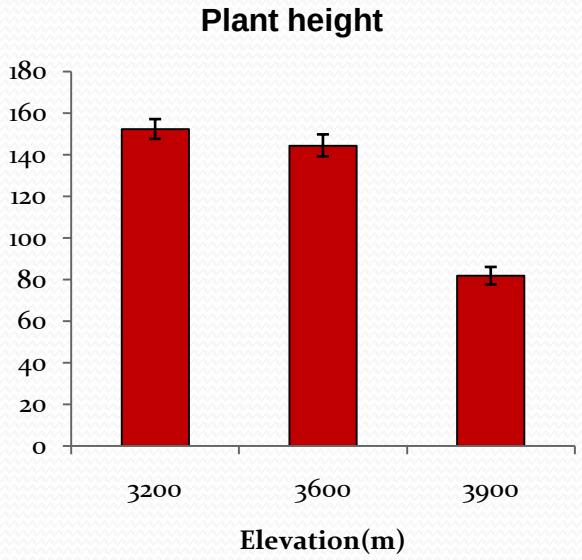
Result & Discussion

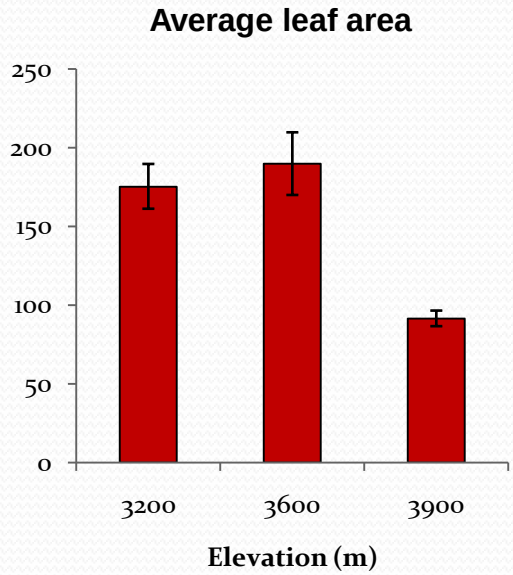
- Density in all stages was found highest between 3600 and 3800m.

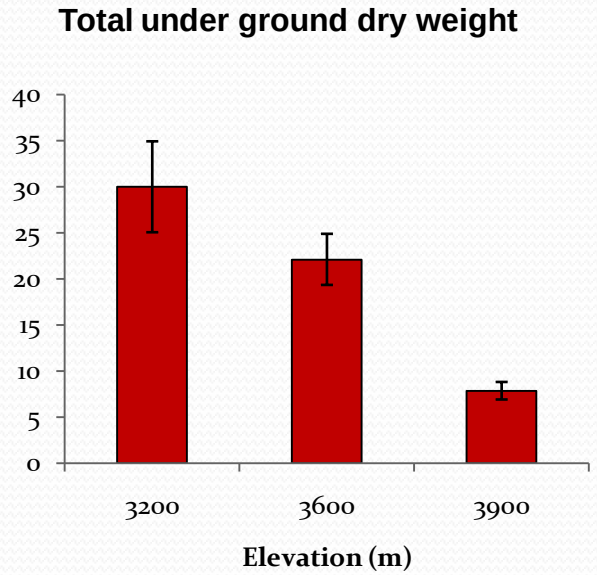


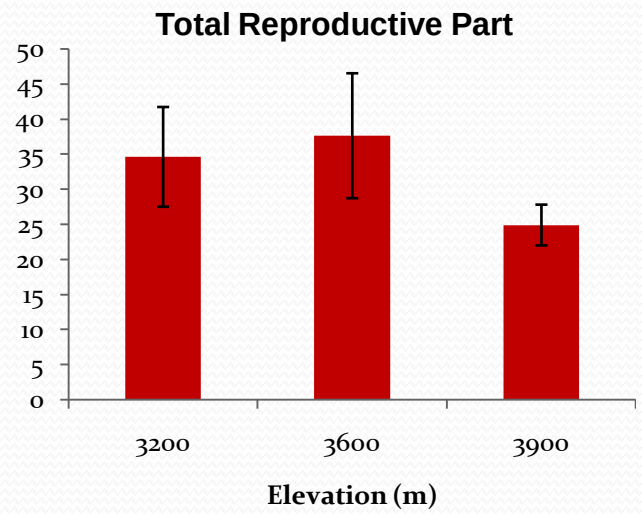
Result contd..

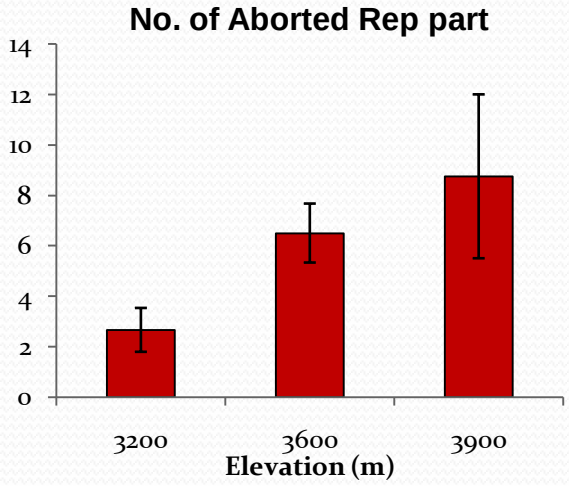
❖ Variation of Life history traits along the elevation gradient











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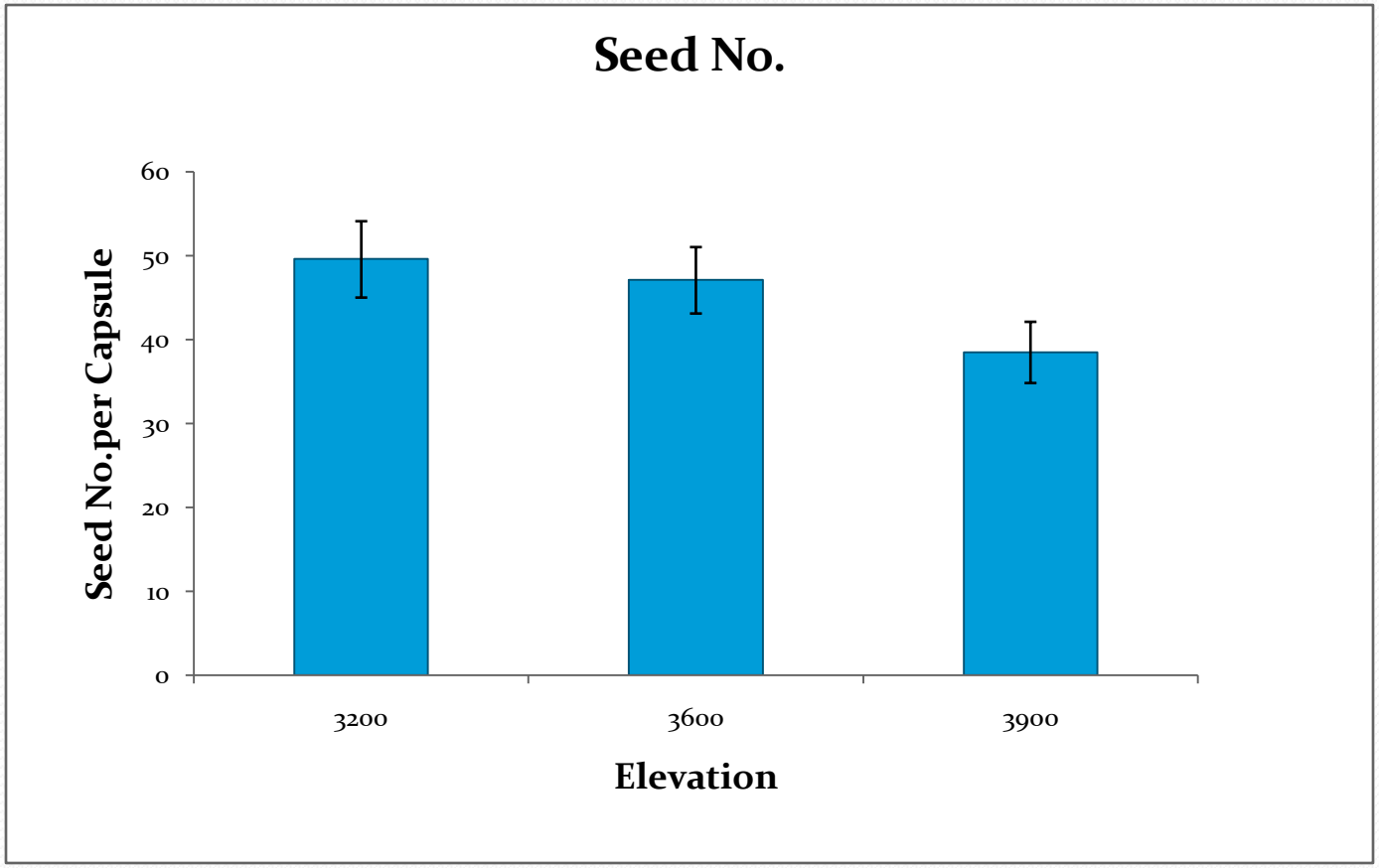
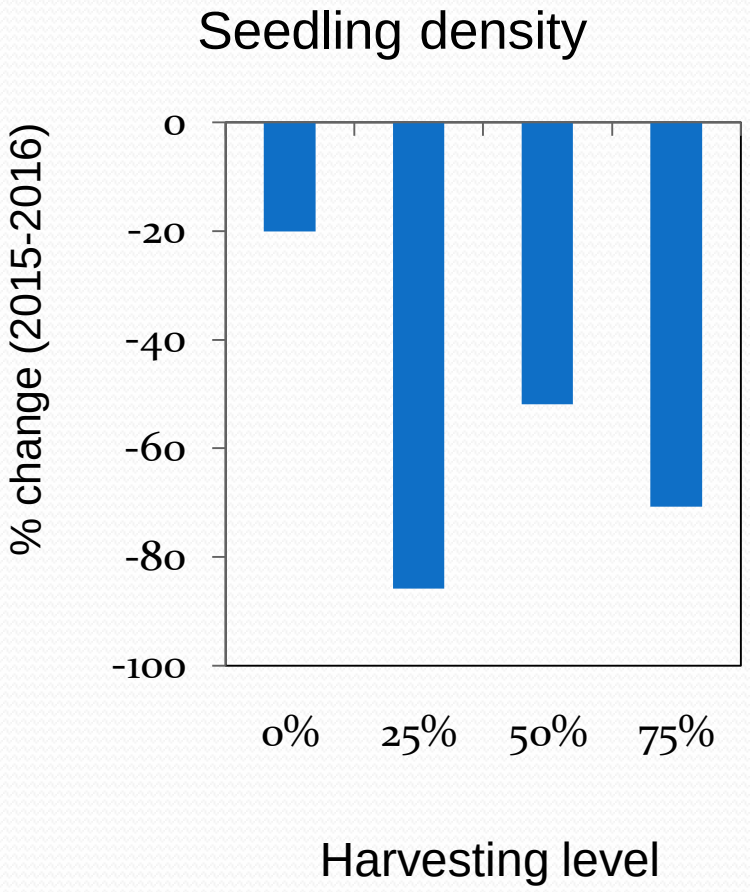
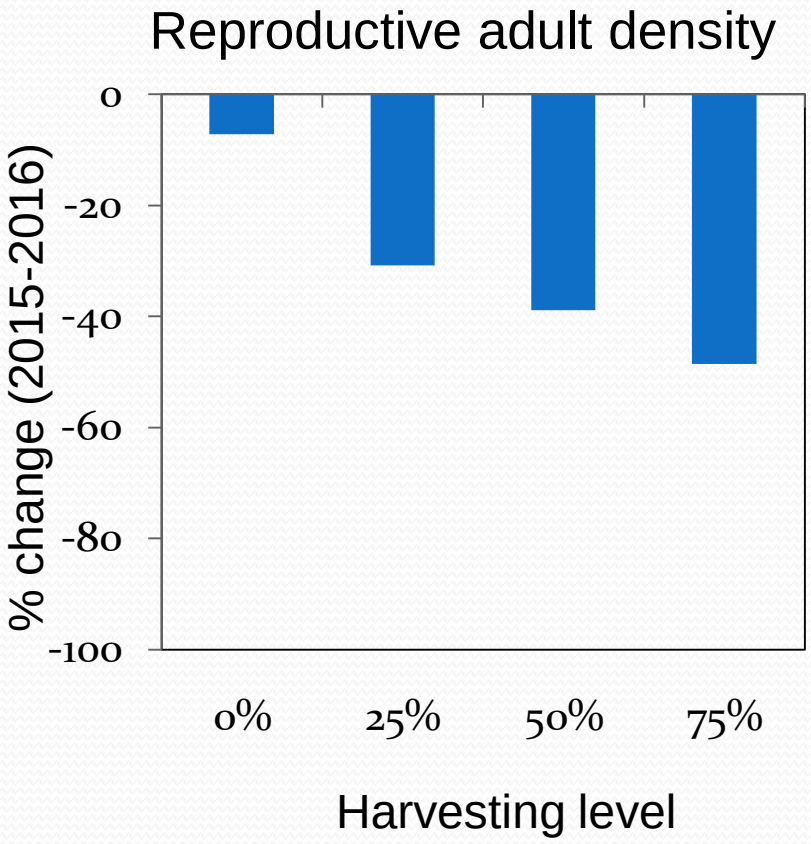

Seed No.
Seed No.per Capsule
60
50
40
30
20
10
0
3200
3600
3900
Elevation

Effect of Harvest on seedling and adult density:

Harvesting has negative impact on the seedling and flowering density.

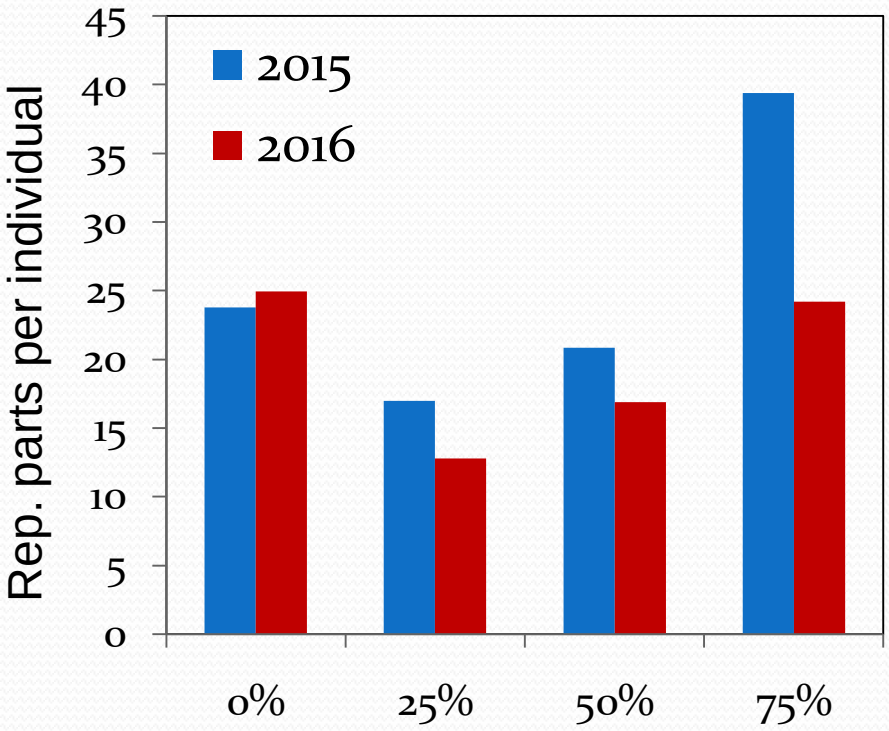


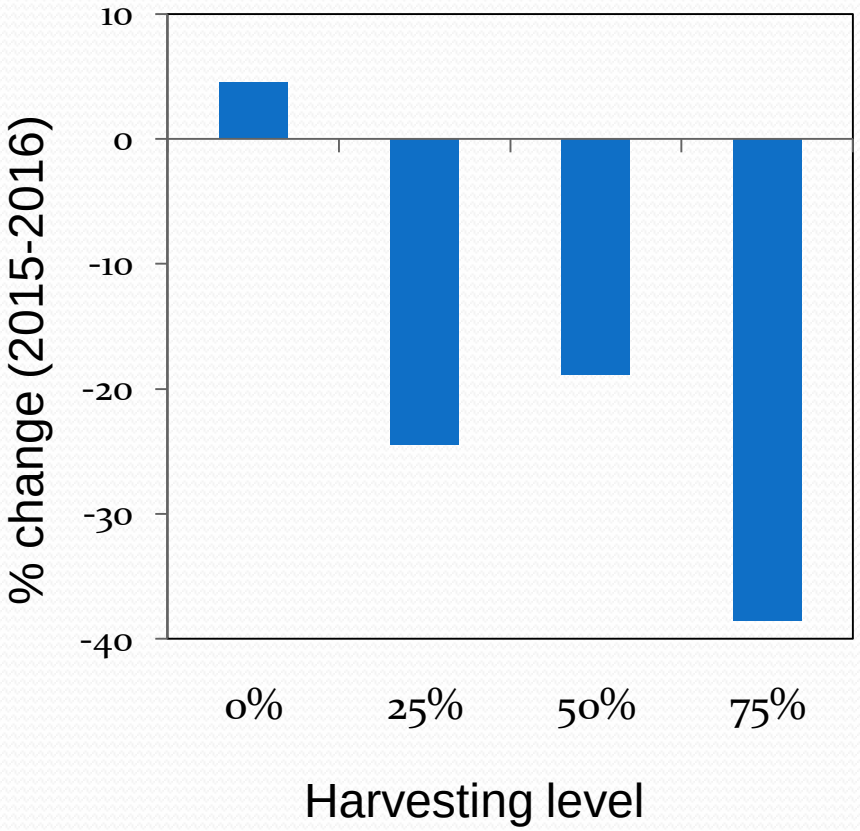


Result contd..

Effect of harvest on total reproductive output:

Harvest has negative impact on total reproductive output of the individual.





Conclusions

- Pants growing in different altitude exhibit variations in a number of vegetative and reproductive traits
- Fitness of *Aconitum spicatum* decreases with increasing elevation
- Harvesting greatly effect reproductive output and density of reproductive adults and seedlings

Recommendations

➢A general awareness is needed to be created among the collectors and the local people about the population biology and conservation value of the species.

➢Management should prioritize their activities on increasing seedling recruitment and reducing damage to the reproductive adults so as to maintain long term viability of available resource base.

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THANK YOU FOR YOUR PATIENCE!!