Discovering the Power of Nature.
Participatory Environmental Education for Sustainability:
Opportunities, Challenges and Practices

Traditional Ecological Knowledge and Natural Resource Management in Alpine Collective Properties

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Introduction

Ecosystem services provision from mountains are at risk with climate change and demographic decline (Palomo, 2017, Bruno et al., 2021, Grêt-Regamey et al., 2020);

Common land organizations (CLO) are models of stewardship and responsible management of natural resources, also due to the knowledge they have of their land (Brondizio et al., 2019, ICCA Consortium, 2021);

CLOs are **custodians of Traditional Ecological Knowledge** (TEK) (Agnoletti, 2007);

TEK is the body of knowledge and beliefs transmitted over time by communities with continuous management of natural resources (Berkes et al. 1993, Berkes, 1999);

TEK is under threat by climate change and demographic decline (Tang e Gavin, 2016);

Limited knowledge in the European context about TEK, especially about forestry and pasture management (notable exception-> Ianni et al., 2015).

Objectives

1. **Identify practices and pieces of traditional ecological knowledge** used in Veneto region by CLOs;
2. **Evaluate the state of use of TEK and related practices** in selected CLOs;
3. **Identify transmission patterns** (to whom and how knowledge is passed) in selected CLOs.

Methodology 1/2 – CLOs and study area

CLOs state in Veneto region:

- 154 farms classified as CLOs (ISTAT 2020) in Veneto;
- Surface: 2,3% utilized agri. area, 8,9% forest area of Veneto;
- **Focus on one type of CLO**: **the Regola**;
- 54 units in Veneto, private organizations.

Comunanza of the Regole di San Vito (association of 3 Regole).

Surface:
5.827 ha (2.022 forest, 3.805 pastures and other non-productive surface).

Regole members:
Historical families of the San Vito area, registered in a Regole registry office (surname based).

Organization:
Each Regola has a president, a vice-president, councillors and treasurer. Each component is elected by the members every 4-5 years.

Methodology 2/2

Objective 1:
ID practices and pieces of TEK in Veneto;

Semi-structured interviews to local experts in the forestry and agricultural sector

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6 interviews: anthropologists, forest practitioners, regional forest services, CLO members, forest guards.

Focus group with local experts belonging to the analysed CLO;

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12 participants: Regole presidents, forest practitioners, local historian, local CI president, farm owner.

Objectives 2-3:
- Evaluate state of use of TEK;
- ID transmission patterns of TEK.

Survey on the community of the CLO.

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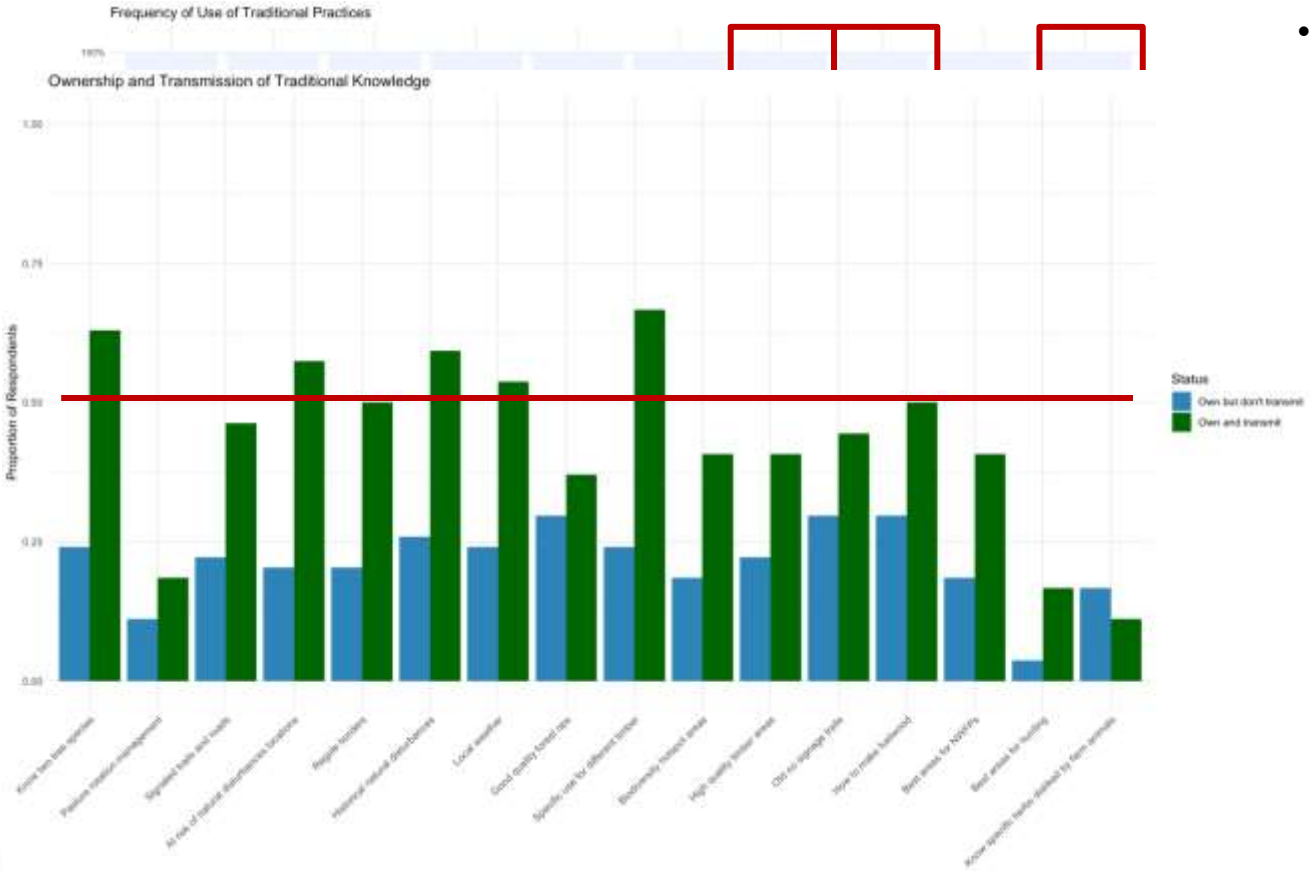
54/282 households responded (19%).

Results 1/3



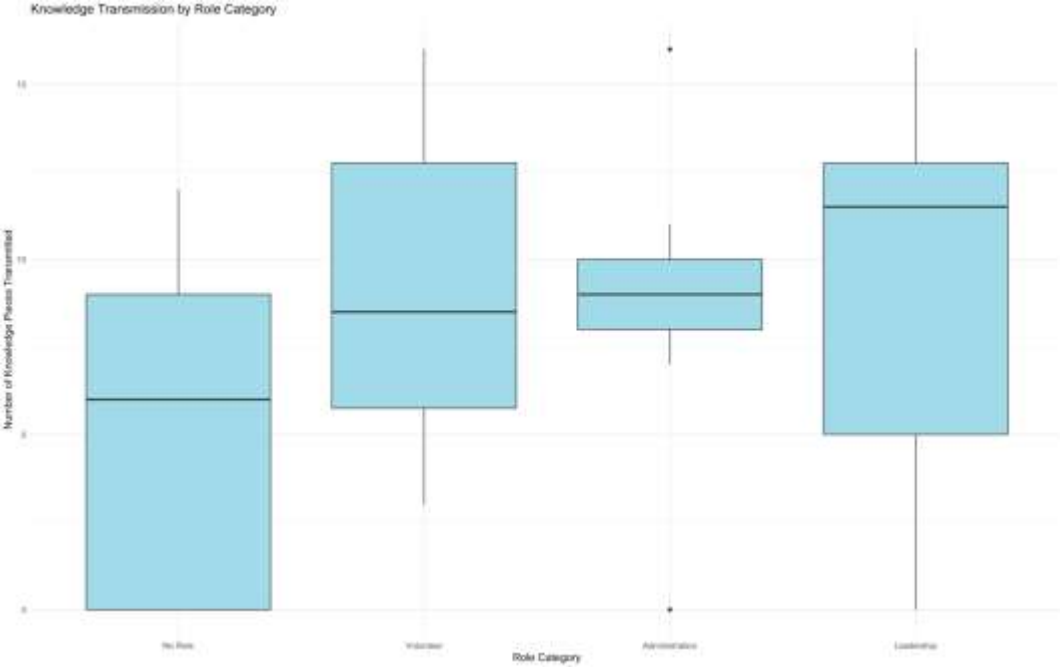
- TEK owned is usually transmitted;
  1 exception: knowledge of herbs disliked by farm animals;
  5 pieces of TEK still owned by more than 50% of the respondents:1) knowledge of at least two tree species, 2) knowledge of areas at risk of natural disaster, 3) historical natural disturbances in the valley, 4) local weather, 5) specific uses for different tree species.

Results 2/3

Correlation between traditional practices and TEK pieces owned

- Positive corr. between n° of practices used and TEK pieces owned (Spearman' rank test, rho=0.44 (pvalue<0.001));
- Tree felling and hunting are corr. with highest n° of TEK pieces owned (Spearman's rank test, respectively rho=0.46, pvalue<0.001, rho=0.36, pvalue<0.01).

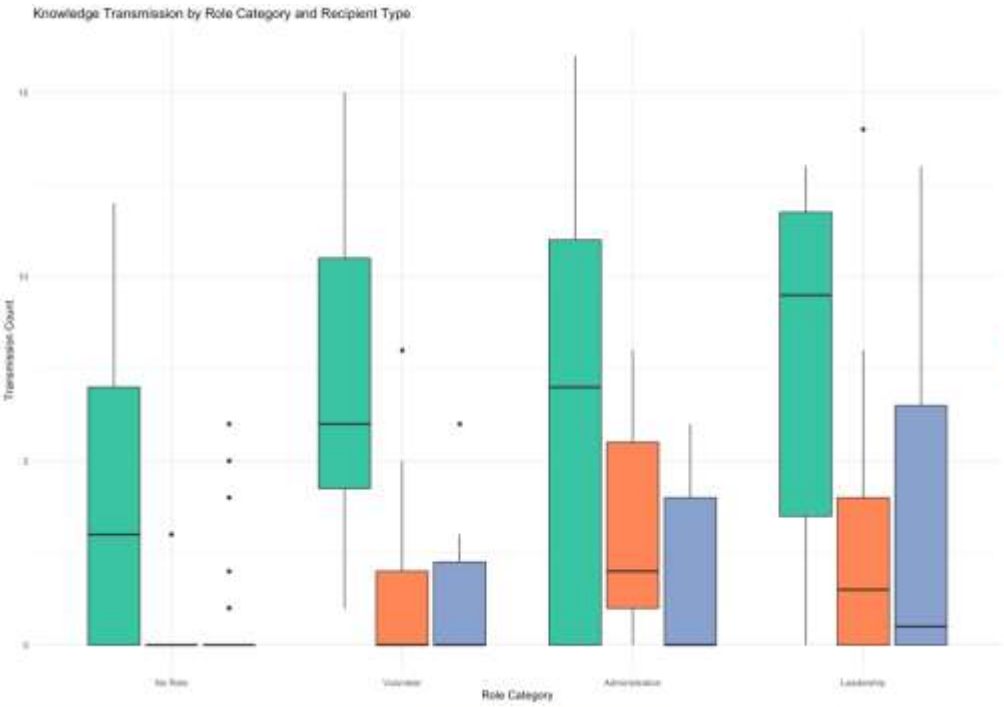
Roles in the Regole and TEK transmission



Kruskall Wallis rank sum test	
Kruskall Wallis chi-squared: 8.8651	p-value = 0.03
df=3	

There are significant statistical differences in role and TEK transmission.

Results 3/3 Correlation between role in Regole and transmission patterns of TEK



Spearman's rank test			
	Channels and actors in transmission	**Corr.**	**P value**
rho1	Transmission to other Regole members	0.59	0.000003
rho6	Transmission through experience	0.29	0.03
rho4	Oral transmission	0.28	0.04

- **Family members** are the main beneficiaries of transmission;
- **Leadership roles** are most important for transmission to other Regole members and external individuals to Regole;
- **Roles with higher responsibility** are correlated with **higher transmission** to other Regole members, through direct experience and oral transmission.

Discussion and conclusions

- Surviving practices are those that are **carried out also by people outside** the Regole;
- Specific cases**:** knowledge that is not transmitted (herbs disliked by farm animals) is possibly because only one farm is still active in the community. Tree felling for fuelwood is still practiced due to the Regole ”*diritto al legnatico*”. Also, it is a reliable and cheap source of energy for heat;
- Having responsibilities in the Regola is key for TEK transmission in the community;
- Maintaining such TEK is **opportunity for constant monitoring** of the land (citizen science!);
- **Implications**: development of strategies for TEK conservation (e.g. more rotation of leadership roles, initiatives for the larger community of residents…).

Thanks for the attention!

View on Mondeval Mountain pastures- San Vito common land

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View on the Boite Valley (Cortina and San Vito) – Common land