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Designing and evaluating alternative adaptive reuses for cultural heritage: a proposal of integration of Choice Experiments and Social Multi-Criteria Evaluation

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Outline

- Objective of the work
 - The evaluation of cultural heritage assets
 - Assessing tangible and intangible effects
 - Creating consensus and participation
 - Adaptive reuse strategies
 - The decision context of the Valle d'Aosta castles system
 - The castles of Arnad, Ussel and Montjovet
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- The integrated evaluation framework
 - The Choice Experiment study
 - Definition of attributes and levels
 - Experimental design and survey development
 - Estimate model
 - Interpretation of the results of the CE study
 - Preferences of residents and tourists
 - Generation of alternative projects
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- A proposal for the application of the SMCE
 - Stakeholders analysis
 - Steps for the evaluation model
 - Conclusions and Future perspectives

Objective of the work

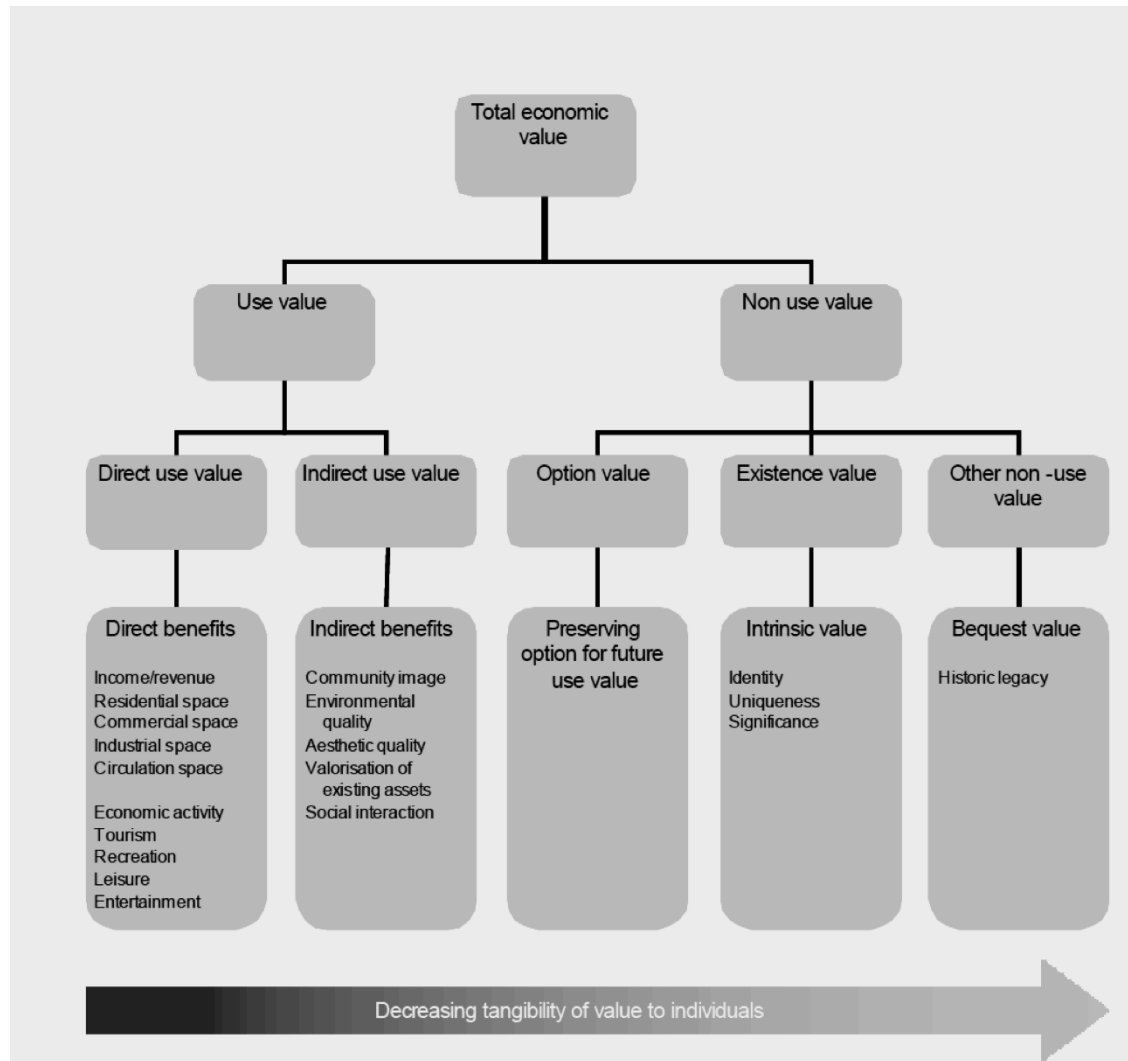


Hotspots

- Cultural heritage as multidimensional notion
- Adaptive reuse
- Local communities and stakeholders participation

The purpose of the study is to investigate the applicability of a **multi-methodological evaluation framework** based on the integration of **Conjoint Analysis-Choice Experiments** (McFadden, 1974) and **Social Multicriteria Evaluation** (Munda, 1995; 2004) for supporting the decision-making process for the adaptive reuse of three disused castles in Valle d'Aosta (Italy)

The evaluation of cultural heritage assets



Requirements for sustainable heritage decisions

(Throsby, 2001)

- Generation of tangible and intangible benefits
- International equity
- Intragenerational equity
- Participation/Empowerment
- Maintenance of diversity
- Precautionary principle
- Recognition of interdependence

Objective of the work

Evaluation of cultural heritage

Decision context

Integrated evaluation framework

Choice Experiment

SMCE

Conclusions and Perspectives

The evaluation of cultural heritage assets

Definition of Adaptive Reuse

(Latham, 200; Cooper, 2001; Bullen and Love, 2011)

Respect and retain the building's heritage significance and add a contemporary layer that provides value for the future. Outcomes of Adaptive Reuse include improvements in material and resource efficiency (Environmental sustainability), cost reductions (Economic sustainability) and retention (Social sustainability).

Experts Panel

- Designers (1)
- Architecture's Historians (2)
- Economists (2)
- Associations for castles' conservation (1)
- Expert of Public Policy (1)
- Expert of Conservation of Cultural Heritage (2)
- Evaluators (3)

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Literature Review

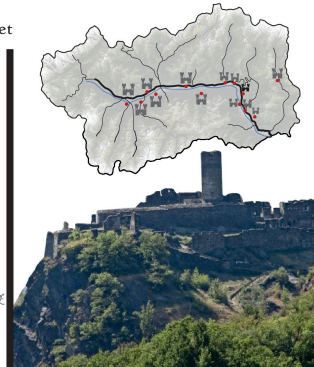
Attributes of adaptive reuse

- **Reversibility**
Ability to change function according to new emerging instances with low transformation costs
- **Consistency among use and existing buildings**
Choice of Functions consistent with the existing structure
- **Congruence with territorial vocations**
Considering environmental, social and economic context
- **Local communities' and stakeholders participation**
The involvement starts within the design steps. Local and social identity
- **Economic feasibility**
Achieving balance between incomes and costs
- **Compatibility**
physical, functional, structural
- **Reintroduction in every day life cycle**
Continuous use
- **Multi-functionality**
Complementary functions for period (day, season,...) and potential return on investment

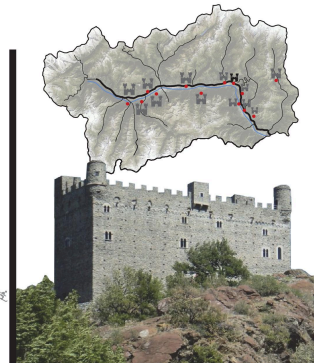
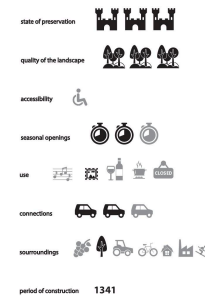
The decision context: Who, What, for Whom

S.W.O.T. ANALYSIS

The castle of Montjovet



The castle of Ussel



The castle of Arnad



Castles	Strengths	Weaknesses	Opportunities	Threats
Arnad	Frescos pictorial cycle	Currently under partial restoration Need of expensive and extensive restoration works Not so good accessibility	The vineyards in the park represent a good opportunity for the castle's valorization The annual event Sagra del lardo that involves local economic activities	No future use defined
Montjovet	Panoramic view Path in the nature	No accessibility for disabled people: the only way to get to the castle is first by car and then by foot The castle is in ruins: there are limited opportunities for giving it a function	There is a strong relationship between orography and architecture, which increases the attractiveness of the castle Saint-Germain is located on the "castle highway" (A5: that is the highway passing by Ussel, Cly, Issogne, Arnad), and it is clearly visible	
Ussel	The castle is open to the public and is well maintained It is used for exhibition purposes and has big open spaces	It is open for visits only from the 1st of April until the 31st of October, because it has no heating system and thus it is closed during the winter months The castle is not accessible for the disabled and hard to get to, since one has to climb the steep, on which it is located, hill by foot. One of its main characteristic features is the accessible rooftop, from where with a beautiful view can be admired.	It is located on a high hill and is visible from the road; There is a parking lot and a bar-restaurant just under the hill where the castle is located	The environment around the castle is strongly affected by anthropic activities.

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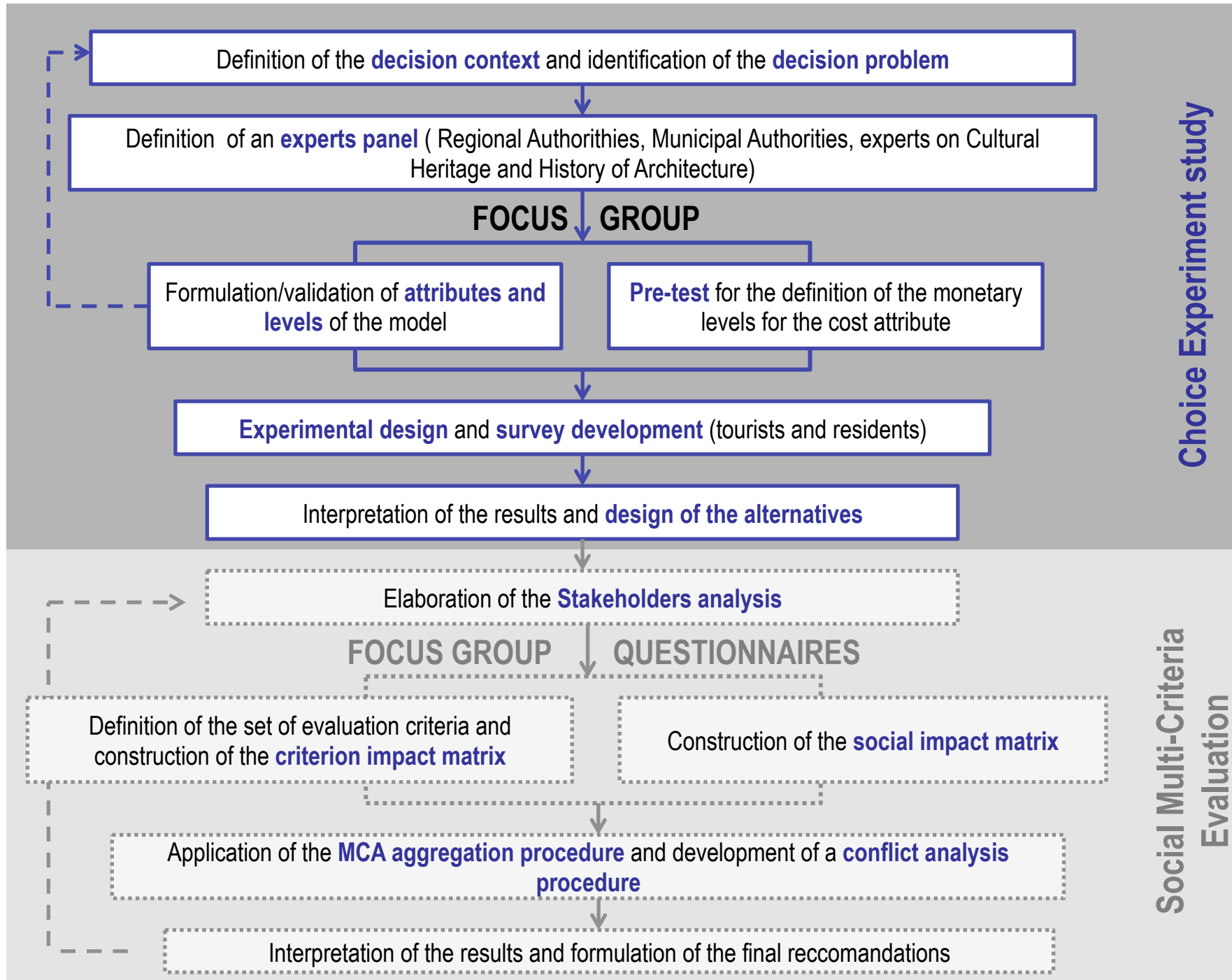
Integrated evaluation framework

Choice Experiment

SMCE

Conclusions and Perspectives

The integrated evaluation framework



The Choice Experiment study

Methodological background

Choice Experiment refers to a variegated set of mainly statistical methodologies which aim to study individual choices using preferences expressed about various profiles, i.e. several versions of a product or service (McFadden, 1976):

1. CE are based on a set of attributes describing the good/service taking a number of levels.
2. Levels and attributes are combined to build up hypothetical bundles, using experimental design.
3. Individuals are asked to state their preferences over these alternatives
4. During the decision-making process, individuals appraise the worth of each combination, and their choice demonstrates prioritization among the different combinations of features.



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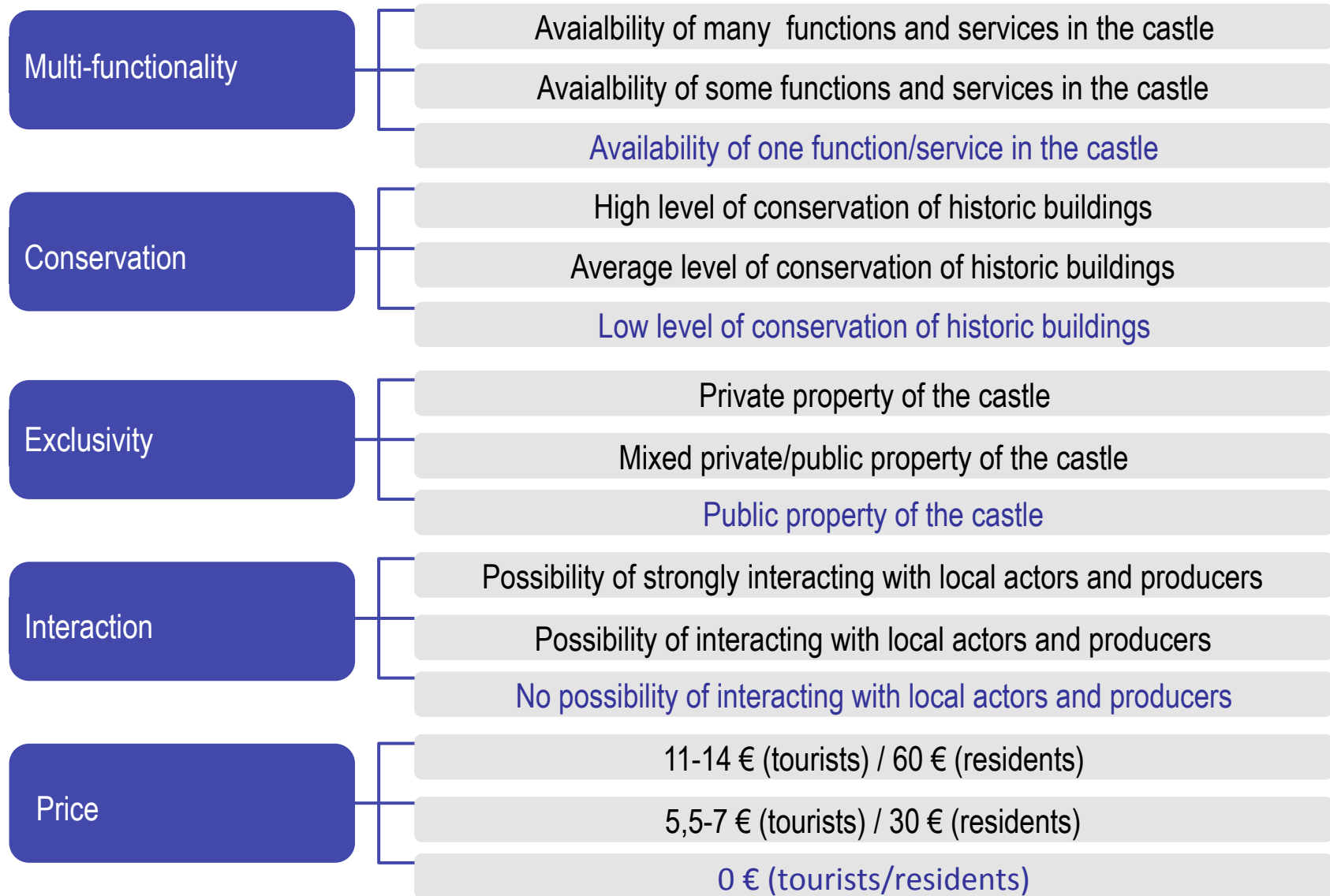
Choice Experiment

SMCE

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The Choice Experiment study

Definition of attributes and levels



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The Choice Experiment study

Experimental design and survey development

Which alternative do you prefer?

Alternativa 1	Alternativa 2	Status quo
		
<ul style="list-style-type: none">- Multifunzionalità : media- Stato di conservazione : medio- Esclusività : semi-privato- Interazione : bassa- Costo : 25 €	<ul style="list-style-type: none">- Multifunzionalità : elevata- Stato di conservazione : medio- Esclusività : pubblico- Interazione : bassa- Costo : 50 €	<ul style="list-style-type: none">- Multifunzionalità : bassa- Stato di conservazione : basso- Esclusività : pubblico- Interazione : bassa- Costo : 0 €

600 respondents (tourists and residents for the three castles) surveyed with **face-to-face interviews**

Questionnaire organized in three parts: a) **people's attitude** toward the cultural heritage; b) **conjoint analysis questions** and c) **socio-economic profile** of the respondent

The Choice Experiment study

Estimated model

The **Binary Logistic Regression** was applied, which is used for estimating the probability that a characteristic is present (e.g. estimate probability of "success") given the values of explanatory variables.

The logistic model can be expressed as

$$\log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \sum_{j=1}^n \beta_j X_j + \epsilon \quad \pi = \frac{\exp(\beta_0 + \sum_{j=1}^n \beta_j X_j)}{1 + \exp(\beta_0 + \sum_{j=1}^n \beta_j X_j)}$$

where π represents the probability that the scenario is preferred, β_0 is the constant and β_j are the coefficients of the n attributes X_j .

Interpretation of the results of the CE study

Preferences of tourists and residents

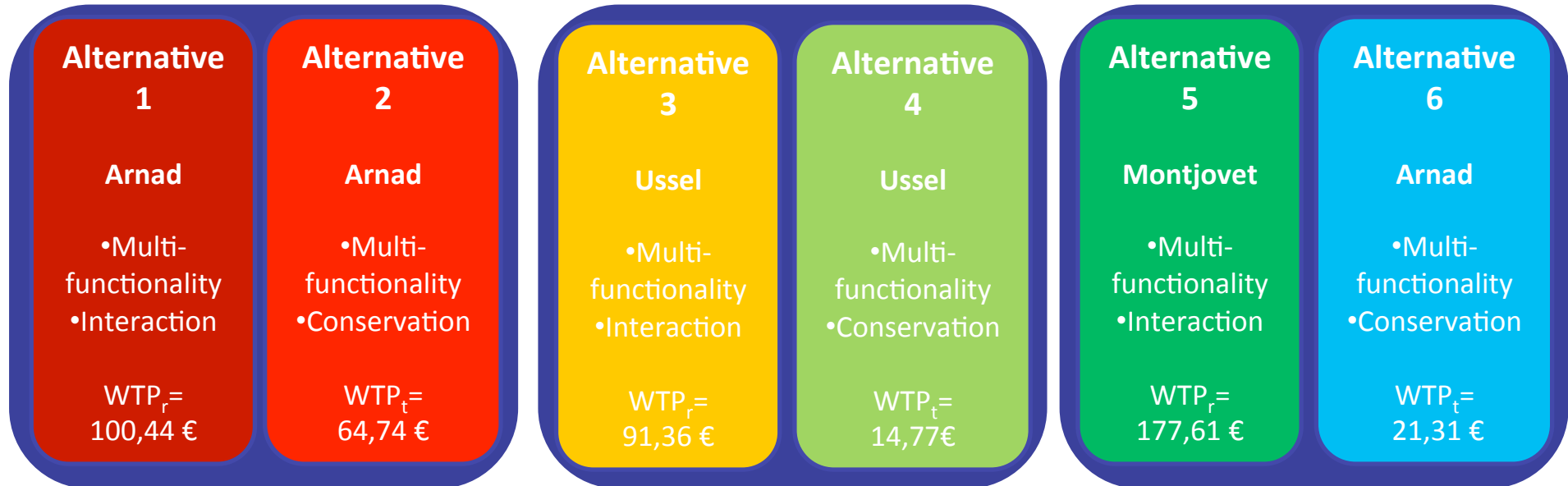
	Arnad		Ussel		Montjovet	
	Residents	Tourists	Residents	Tourists	Residents	Tourists
Multi-functionality	0,729	0,91	0,703	0,054	0,601	0,741
Conservation	0,532	1,413	0,396	0,455	0,586	0,501
Exclusivity	-0,567	-0,618	-0,452	-0,53	-0,489	-0,697
Interaction	0,538	0,538	0,619	0,036	0,655	0,234
Price	-0,015	-0,038	-0,016	-0,058	-0,007	-0,061

The analysis of the Logit coefficients shows that:

- The **price has always a negative sign**, meaning that there the attribute is not appreciated
- The exclusivity has always a negative sign as **respondents tends to appreciate a public property** of the cultural assets
- **Tourists tend to appreciate conservation** more that residents
- One of the most important attribute **for resident is the multi-functionality** of the castles

Interpretation of the results of the CE study

Generation of the alternative reuse projects



The Logit coefficients were used for estimating the **Willigness To Pay** (Harpman, 2008):

$$E(WTP|WTP \geq 0) = \frac{\ln(1 + e^\alpha)}{-\beta_{mon}}$$

where α is the sum of the coefficients $\beta_j X_j$ for all the attributes, excluding the price

Following this formula, it was possible to calculate the **WTP for each castles with reference to the two most preferred attributes**, both for residents and for tourists

Interpretation of the results of the CE study

Generation of the alternative reuse projects

Castle of Montjovet



- multifunctionality



- conservation



- interaction



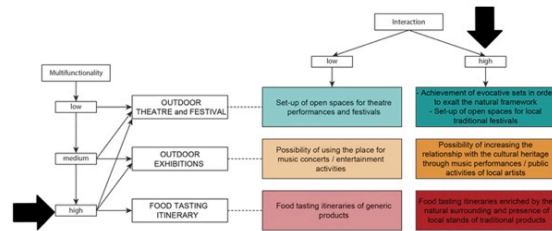
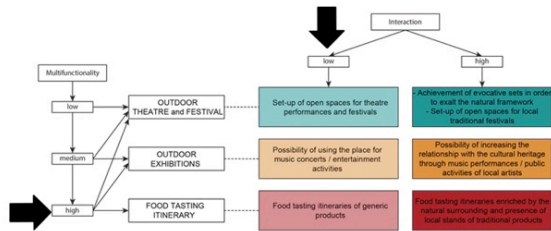
- multifunctionality



- conservation



- interaction



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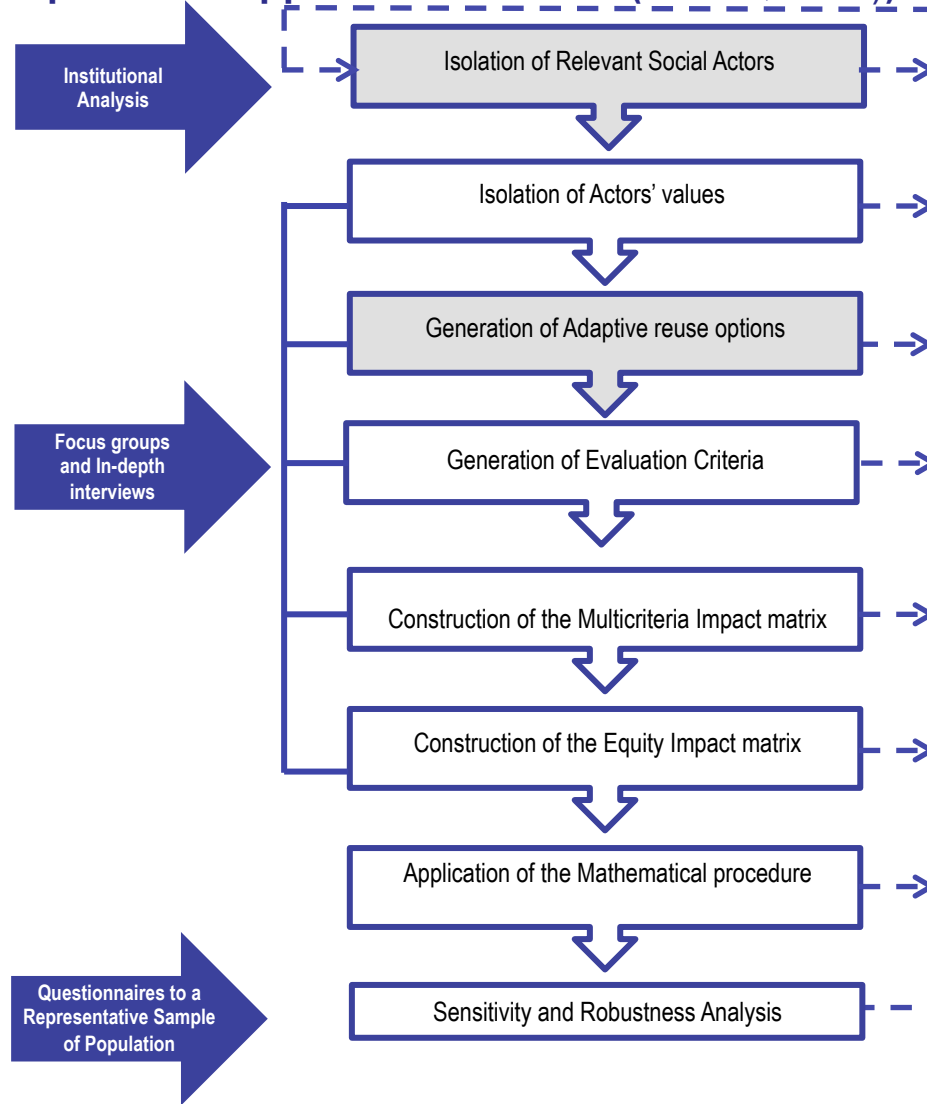
Choice Experiment

SMCE

Conclusions and Perspectives

A proposal for the application of the SMCE

Steps for the application of SMCE (Munda, 2004))



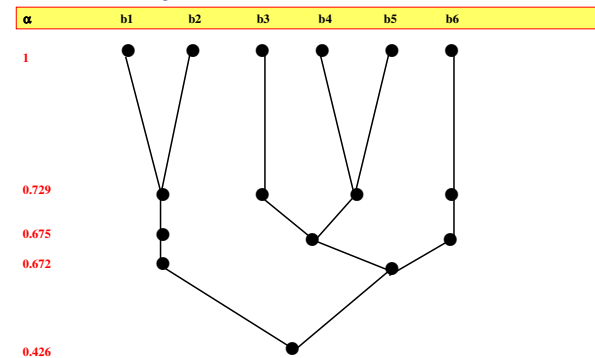
Social and Technical Incommensurability (Munda, 2007).

Results of Choice Experiment

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Arnad	Arnad	Ussel	Ussel	Montjovet	Arnad
+Multi-functionality +Interaction	+Multi-functionality +Conservation	+Multi-functionality +Interaction	+Multi-functionality +Conservation	+Multi-functionality +Interaction	+Multi-functionality +Conservation
WTP _i = 100,44 €	WTP _i = 64,74 €	WTP _i = 91,36 €	WTP _i = 14,77€	WTP _i = 177,61 €	WTP _i = 21,31 €

The evaluation criteria are aimed at representing the general objectives and interests of the social actors identified by stakeholders' analysis. The evaluation criteria are a technical translation of social actors' needs, preferences and desires operated by the research team (Munda, 2007).

Example of dendrogram of the cluster formation process

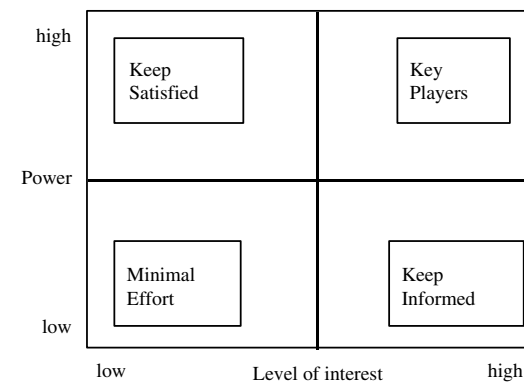
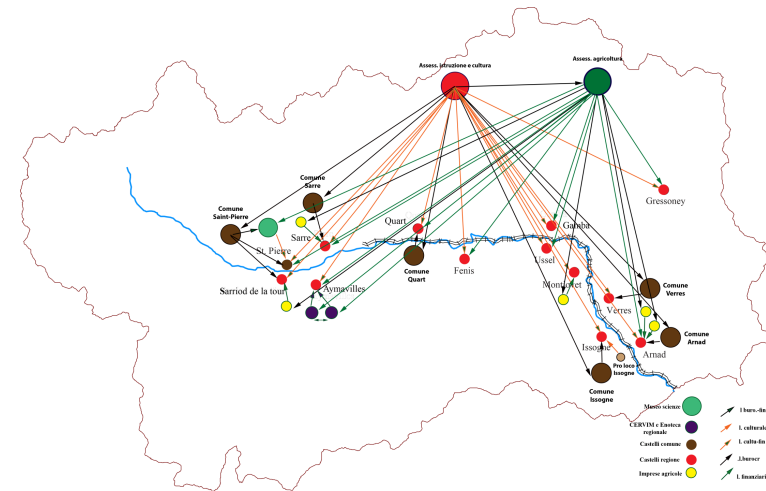


A proposal for the application of the SMCE

Stakeholders analysis: Social actors, Scale of action, Resources

(Bourne & Walker, 2005; Munda, 2007)

Castle	Social actor	Scale of action	Resources
Ussel	Department of Education and Culture	Regional	Political power
	Authority for protection of cultural heritage and activities	Regional	Political and position power
	Department of Agriculture and Natural resources	Regional	Political power
	Office of Ethnology and Linguistics	Regional	Information power
	Association Mountain photo festival	Regional	Personal power
	Association of Valle d'Aosta farmers	Regional	Personal power
	Courmayeur association	Regional	Personal power
	Council of Architects and Engineers	Regional	Information power
	Municipality of Chatillon	Local	Legitimate power
	Arnad	Department of Education and Culture	Regional
Authority for protection of cultural heritage and activities		Regional	Political and position power
Department of Agriculture and Natural resources		Regional	Political power
Office of Ethnology and Linguistics		Regional	Information power
Association Mountain photo festival		Regional	Personal power
Association of Valle d'Aosta farmers		Regional	Personal power
Courmayeur association		Regional	Personal power
Council of Architects and Engineers		Regional	Information power
Regional Slow Food Association		Regional	Connection power
Cooperative society of handicrafts and traditional pro		Regional	Connection power
Research center of mountain viticulture		Regional	Information power
Regional park of Mont Avic		Regional	Political power
Association Comité Régional Batailles des Chèvres		Local	Connection power
Regional Foundation Music Institute		Regional	Information power
Municipality of Arnad		Local	Legitimate power
Town Council Arnad	Local	Legitimate power	
Agricultural cooperative society Tzathè	Local	Personal power	
Agricultural cooperative society La Kiuva	Local	Personal power	
Monttjovet	Department of Education and Culture	Regional	Political power
	Authority for protection of cultural heritage and activities	Regional	Political and position power
	Department of Agriculture and Natural resources	Regional	Political power
	Office of Ethnology and Linguistics	Regional	Information power
	Courmayeur association	Regional	Personal power
	Council of Architects and Engineers	Regional	Information power
	Regional park of Mont Avic	Regional	Political and position power
	Municipality of Saint Germain	Local	Legitimate power
	Agricultural cooperative society La Kiuva	Local	Personal power



(Olander & Landin, 2005)

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Conclusions and Future perspectives

Strenghts

- CE seems to be suitable for co-constructing alternatives
- There is consistency among CE and the SCME framework
- Distributional issues are considered as a plurality of legitimate values and interests attached to CH have been taken into account
- CH evaluation takes place as a learning process producing common knowledge for DM, communities and tourists and strenghtening social capital
- A conflict analysis procedure is eplicitly used, so distinguishing clearly the technical and social compromise solutions
- Transparency is improved

Issues to be explored

- Use of Mixed Logit approach for the estimation of the CE model
- Definition of an interaction protocol for defining Actor's values and for filling the social impact matrix
- Use of the Threshold model for the aggregation of criterion scores of alternatives
- Integration among Technical ranking and Social ranking
- Sensitivity and robustness analysis (credibility degrees)
- How to manage conflicts if there are not strong coalitions
- Formulation of final raccomandations to DM for final choice