CHOICE MODELING IN NATURAL PARKS

An example from the evaluation of policies for the management of wild animals at Asinara National Park

Choice Modelling

Through this methodology is possible to evaluate the relative importance (weights) of the attributes or characteristics that define a specific good or service.

The methodology has at least there key elements:

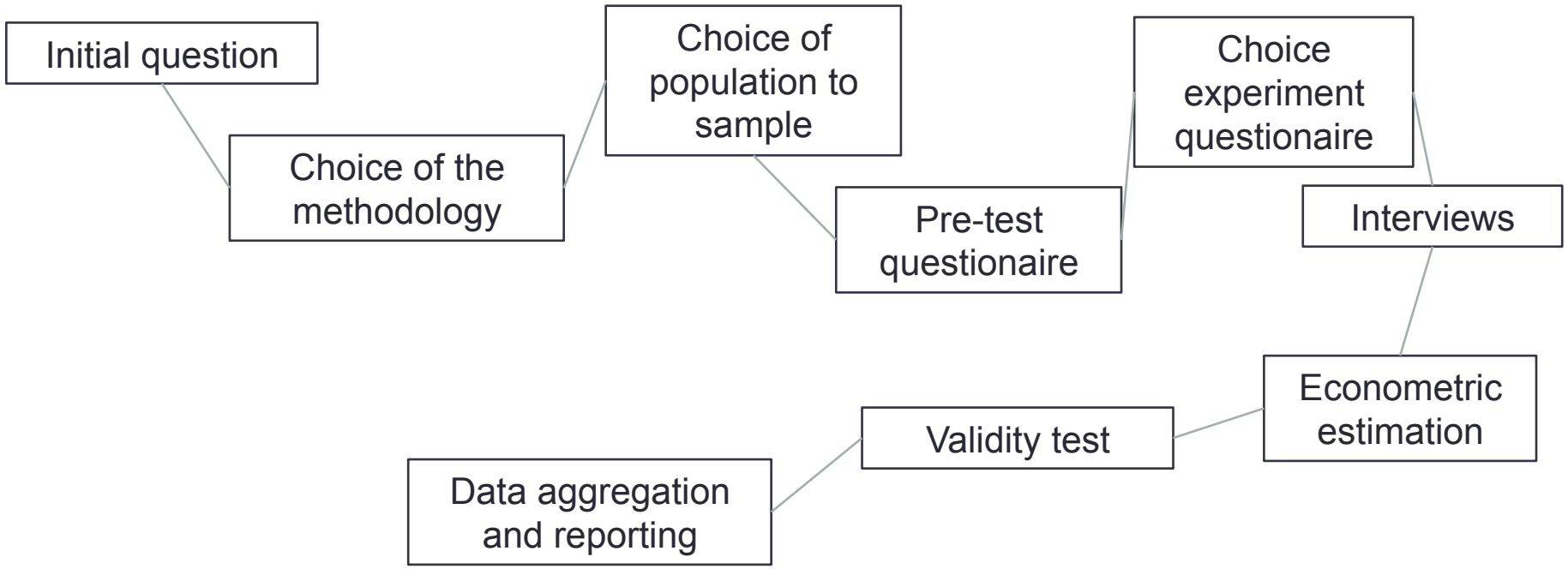
1. The object, good, service or policy is disaggregated into characteristics (attributes) and the quantity of the attributes (levels).

2. The respondent faces hypothetical alternatives made of combination of different levels of the attributes.

3. The choices of the respondents are used to the estimation of the relative importance of the attributes.

Therefore *Choice Modelling* is a methodology which evaluates individual preferences through the choices of the respondents and so is a so called ***stated preferences methodology***.

Choice Modelling example of procedure



Choice Modelling procedure

The typical Choice Modelling procedure is made of three steps:

1. Pre-test or preliminary questionnaire
2. Questionnaire with alternatives made of combinations of the levels of the chosen attributes.
3. Result analysis.

In the first step the pre-test is realized. It includes questions which aim to evaluate which are the most relevant scenarios for the respondents.

The pre-test is also important to identify the attributes of the scenarios that will be applied in the second step.

The WTP can also be asked to respondents to identify the range of values that individuals consider feasible for the payment vehicle to be used in the final questionnaire.

THE PARK PLAN

General report (Pages 53-56)

The island is a paradigmatic example of the conditions of island environments, whether they are placed in the Mediterranean or in the ocean.
It comes with a predominant and difficult-to-manage component of wild domestic fauna whose **environmental pressure** seriously impairs, both the **conservation of natural vegetation** and **the development of typical elements** of an indigenous zoo-cenosis.

In this sense, operational priorities can only lie in **the planned and effective removal** of every wild domestic component.
Some reintroduction operations aimed at restoring zoo-cenosis can be considered on Sardinian situation.

High priority: Removing non-wild animals

- Elimination of pig-boar hybrids
- Elimination of wild goats
- Sale of most of the horses present (if the maintenance of a small group for hippo-tourism activities is feasible)
- Reduction of most of the grey donkeys present and confinement of the remaining in controlled conditions;
- Maintaining a core of white donkeys under controlled conditions (within large enclosures size)

1. Objectives of the Pre-Test Questionnaire

2. Sample analysis

3. Analysis of the results

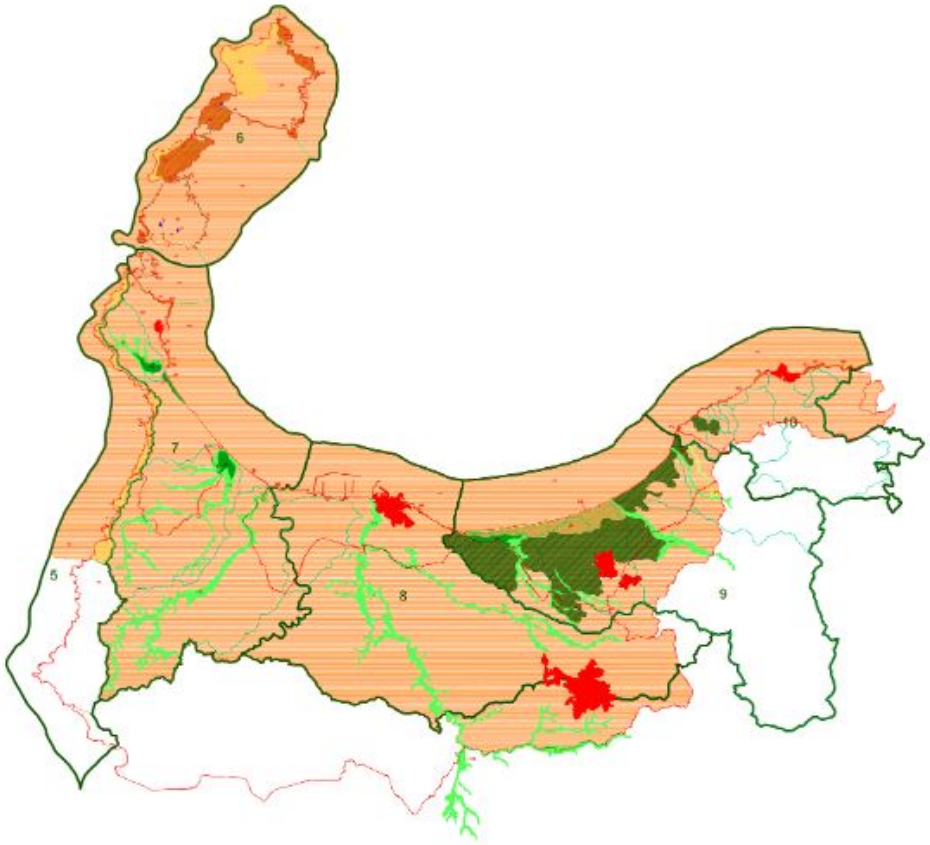
Objectives of the Pre-Test

1. Assess people's perception of the activities in Asinara National Park.

2. Assess the willingness to pay for the implementation of wildlife management policies.

3. The questionnaire was administered through interviews with a random sample of 110 people.

Sample analysis



110 respondents:

56 Women and 54 Men

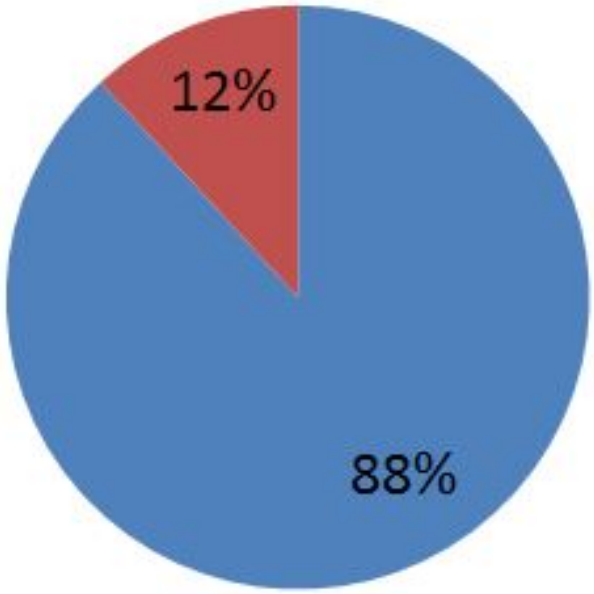
10 Municipalities, 5 are part of the Area Vasta Contigua

Age: 18 – 80+

Occupation and degree

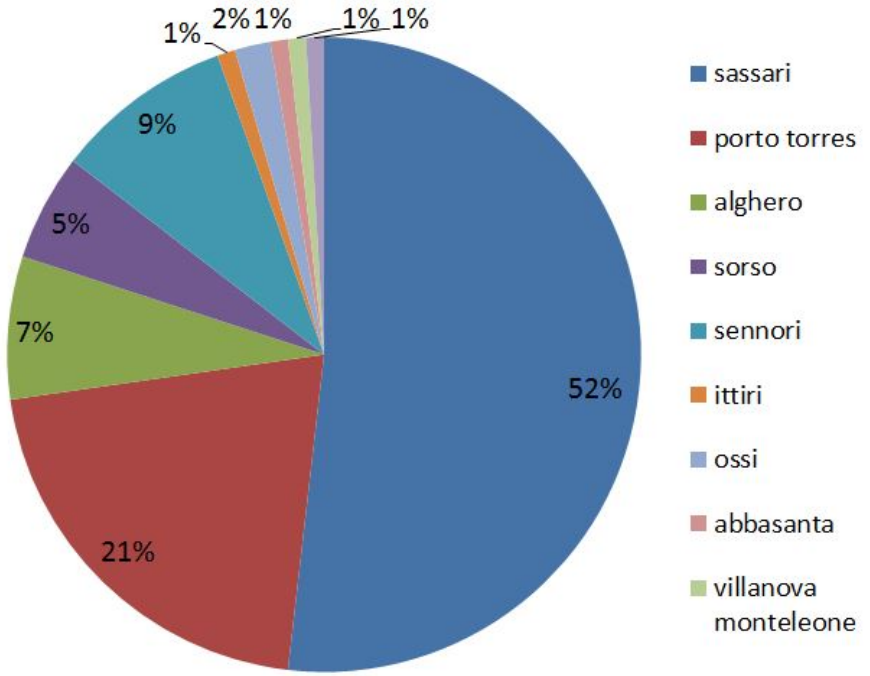
Gross annual income

Municipalities of residence

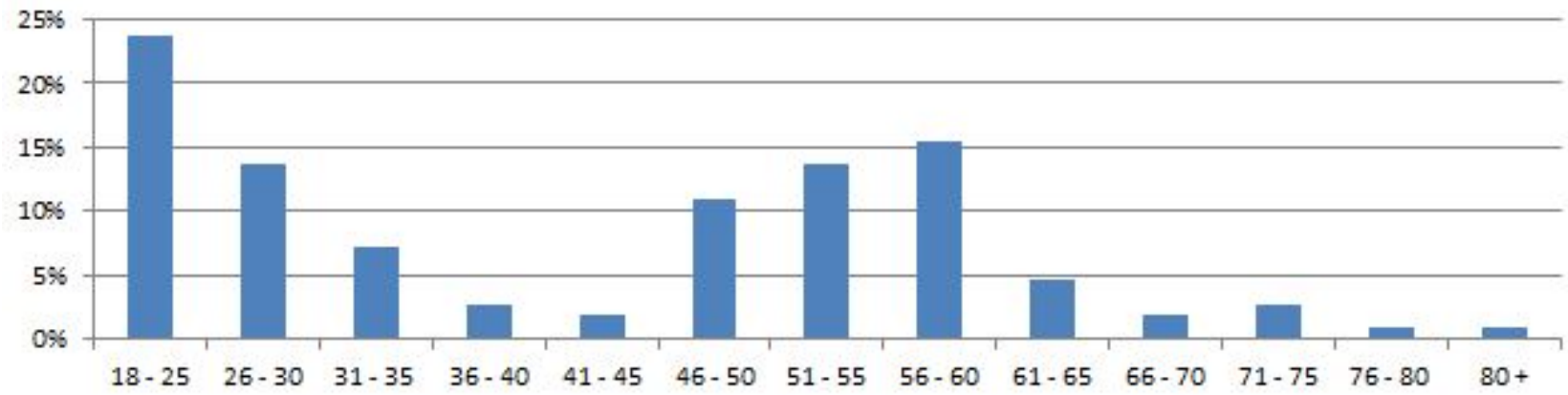


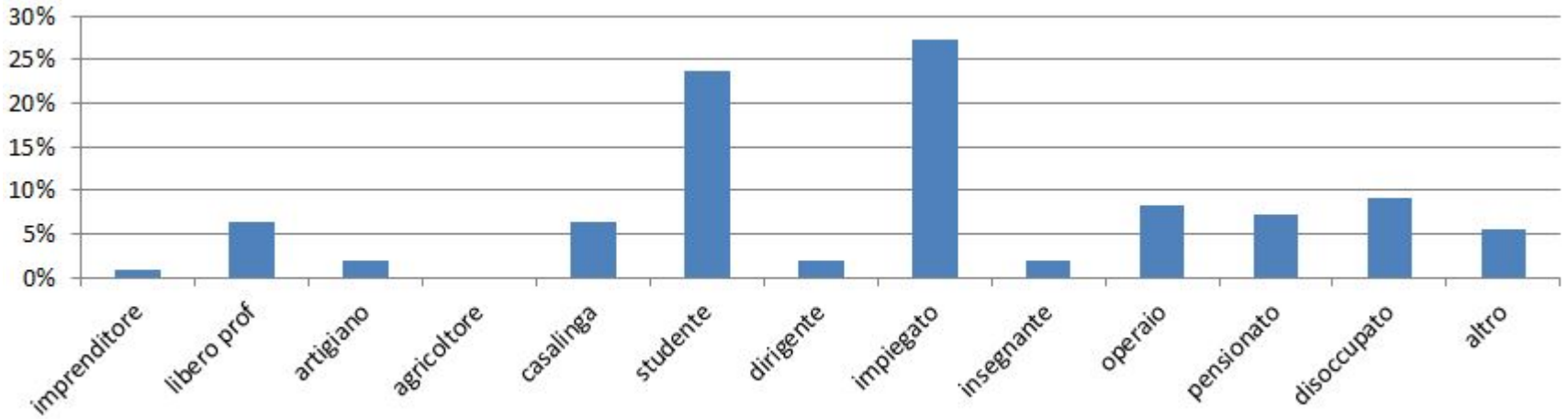
Area vasta contigua

Altri comuni

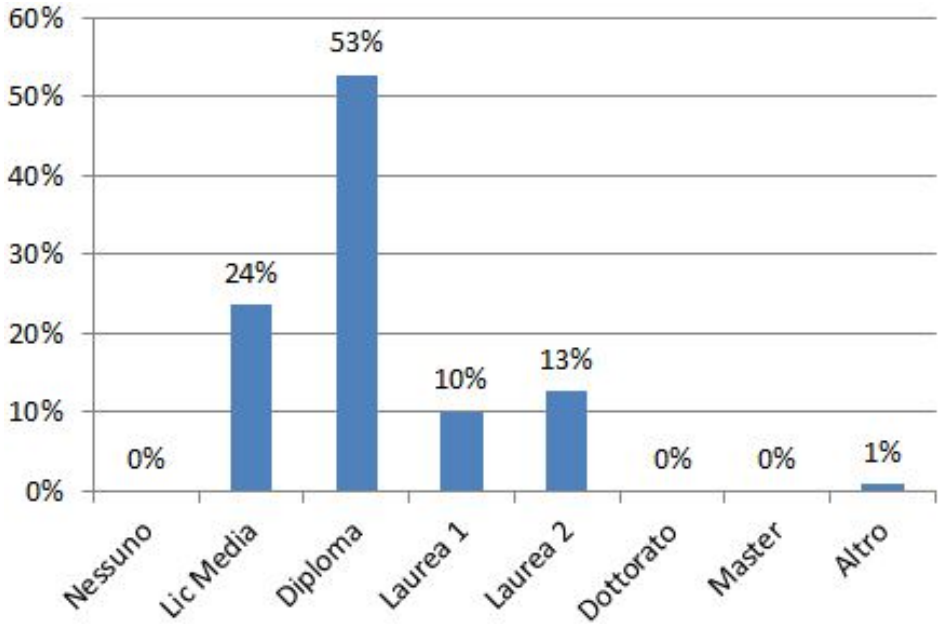


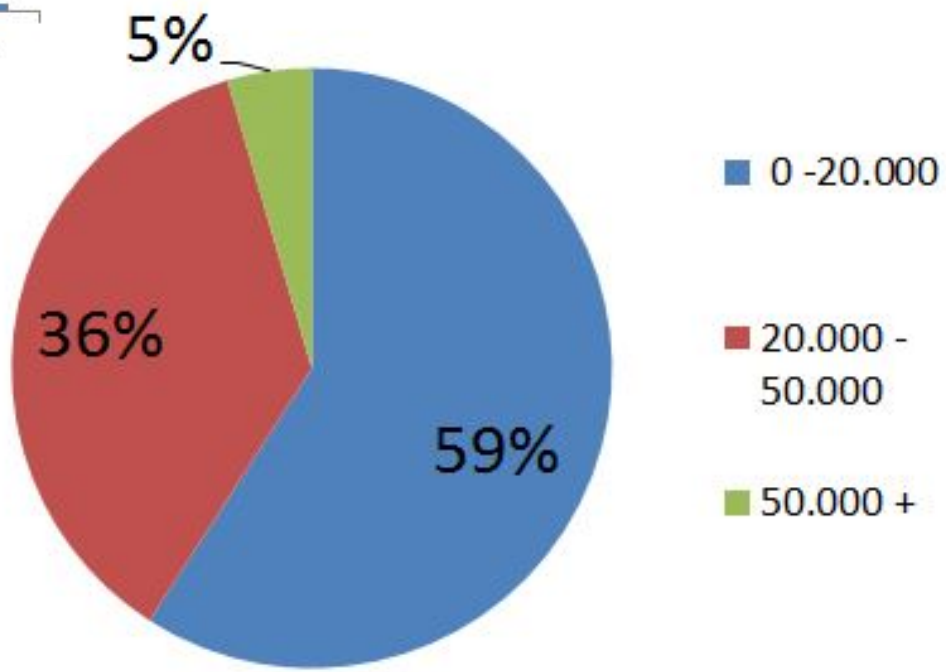
Age and Occupation





Education and Income classes

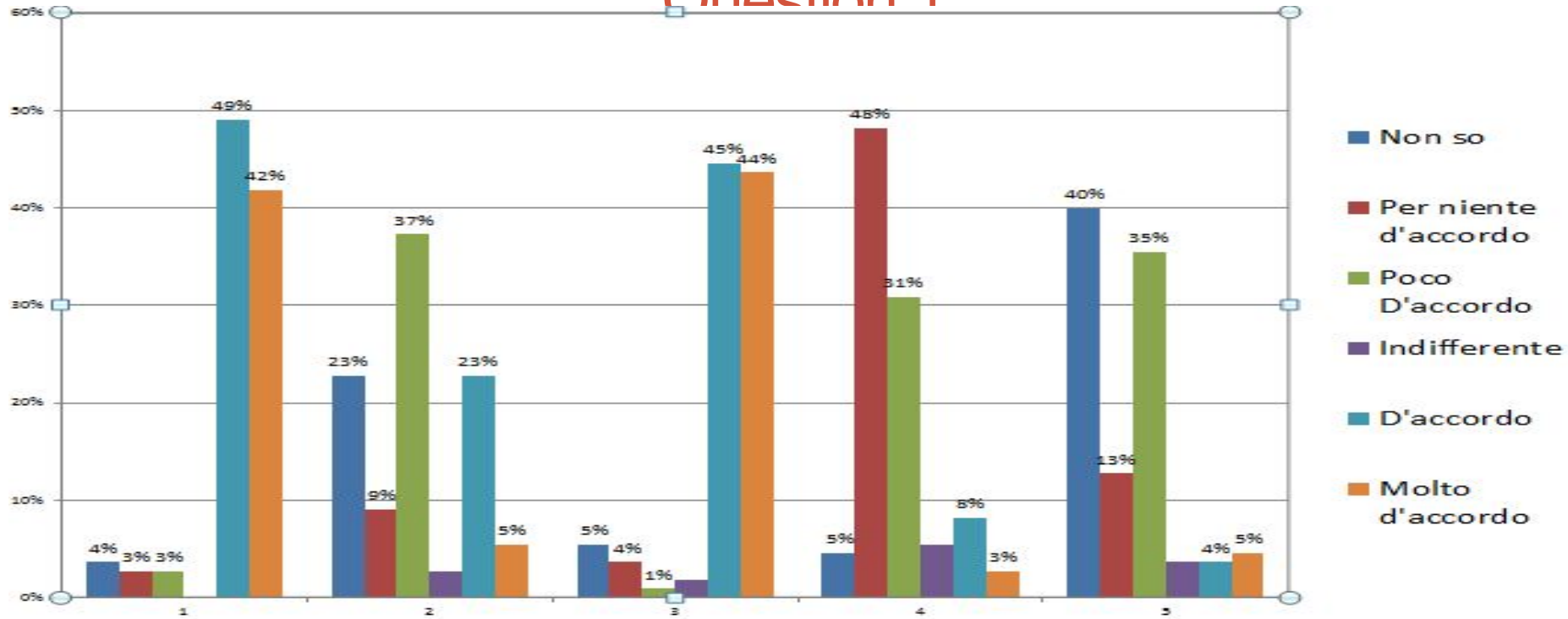




Questionnaire

Part I
Importance of wildlife and nature conservation

Question 1

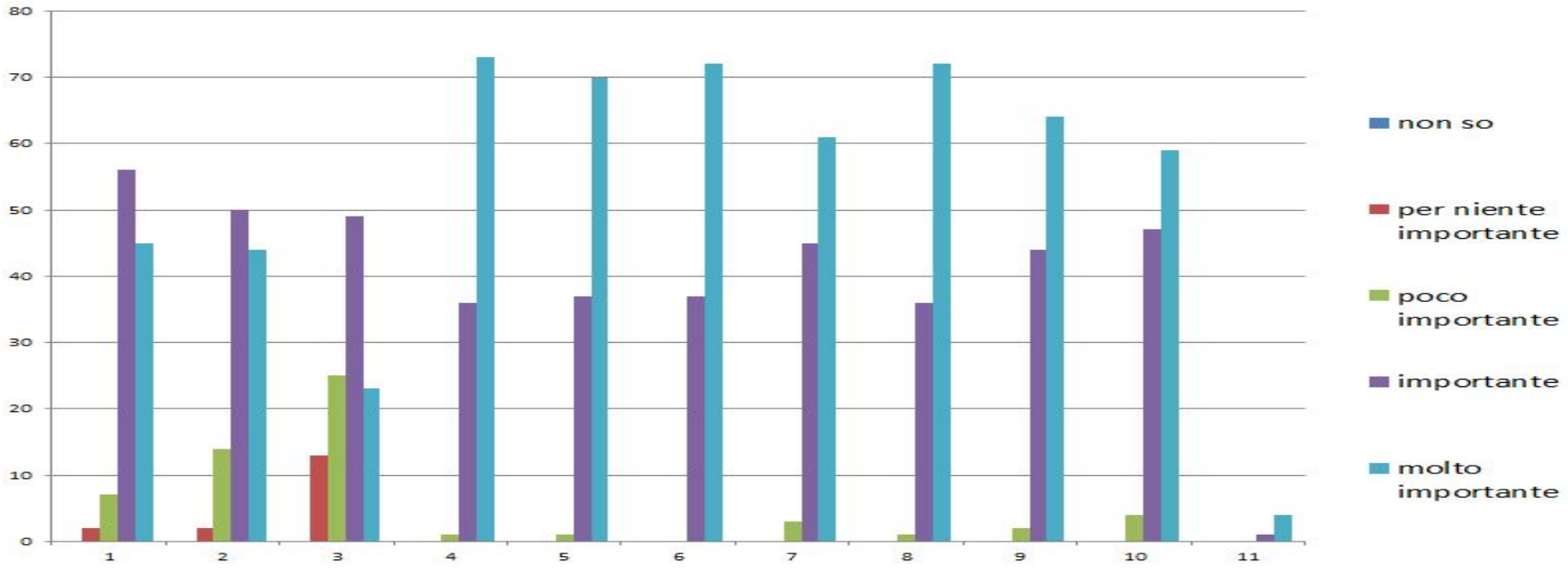


Respondents agree that the Government has to invest resources to protect animal and plant species, and that investment should increase (90% of respondents).

Parks are not adequately funded by the Government (48%), but as many as 40% do not know how to respond to them.

Parks are not seen as a limit to the development of local productive activities (79%)

Question 2



- Species conservation and environmental education are considered more important than tourism.
- Among the three types of tourism proposed, the tourist enjoyment of the natural environment is perceived as the most important.
- Many respondents put the conservation of all animal and plant species (both marine and terrestrial) on the same level.

Questions 3 - 4 - 5

- Out of 110 respondents, 56 (51%) have never visited Asinara National Park.
- The remaining 49% have visited it at least once, 50% of which in the last 3 years.
- The average number of visits of those who have visited the Park is 2.13 times.

Question 6

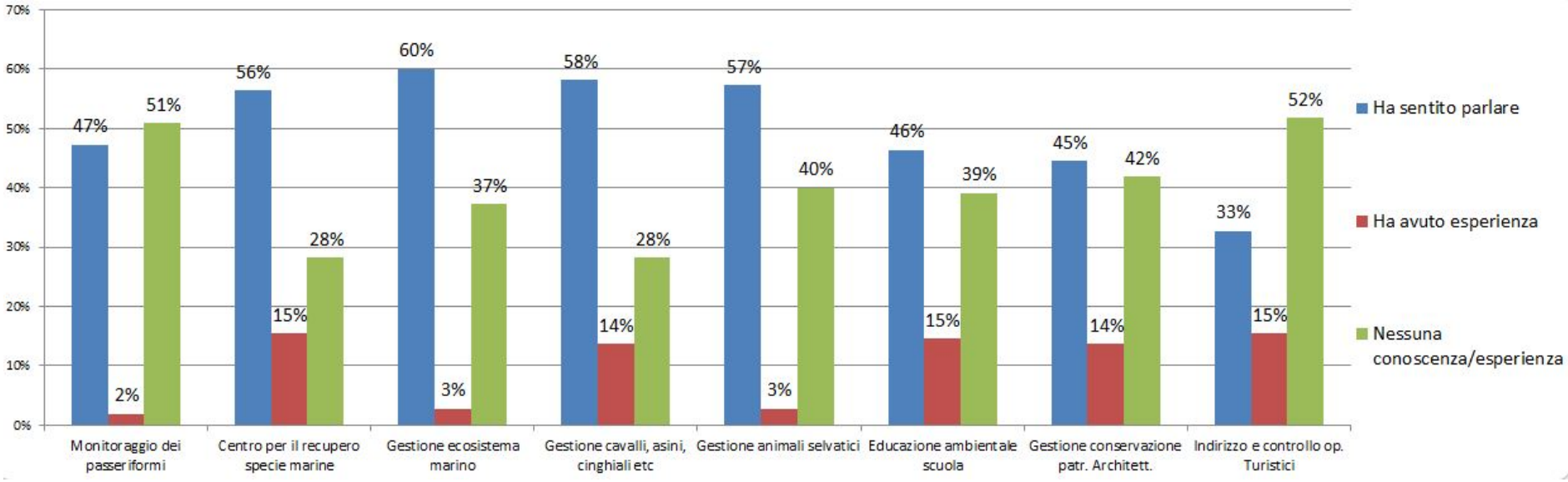
Best-known activities:

- Turtle Recovery and Monitoring Centre for Cetaceans and Marine Species
- Management of horses, goats wild boars and donkeys in the wild

Lesser-known activities:

- Bird monitoring and ringing (passerine)
- Address and control of tour operators

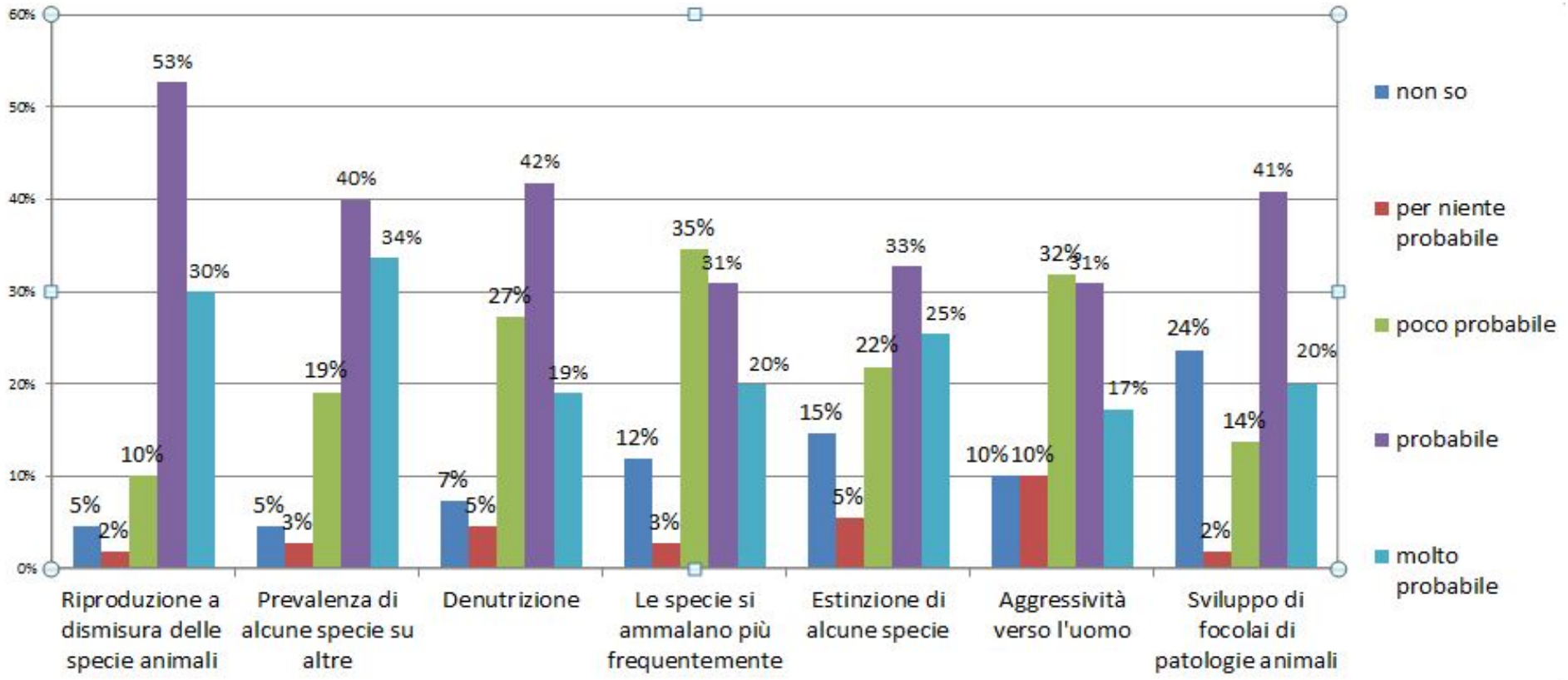
40% of respondents do not have a complete knowledge of the Park's activities, mainly due to the fact that the majority of respondents have never visited it.



Questionnaire

Part II
Opinions on conservation policies

Question 7



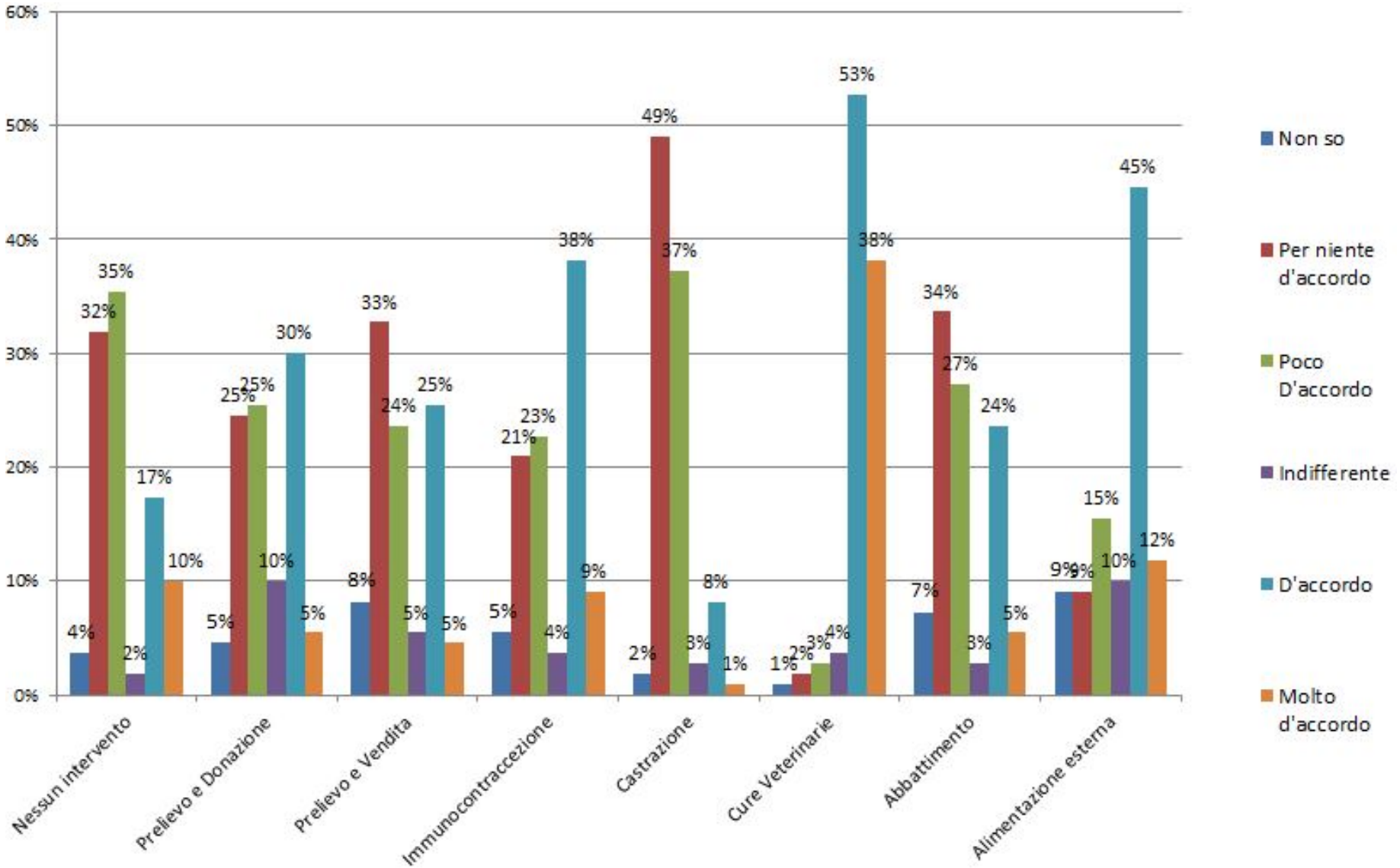
Most Likely Scenarios

- Outsized reproduction of animal species at the expense of plant species (83%)
- Prevalence of some species over others (74%)

Less likely scenarios

- Species are more likely to get sick, reducing numbers (37%)
- Species aggression towards humans (42%)

Questions 8 and 10



Question 8 and 10

- Out of 110 respondents, 89 (81%) are not aware of the problems related to the high number of equines on the island.

- The sample analysis of the management policies (question 8) of non wild animals in the wild (including horses) reflects this figure.

- **The most favoured** (but not solving the problem) policies appear to be:
- - Veterinary care of specimens seeking medical attention
- - Food from man

- **The least favoured policies** are the most drastic (but actually the most effective) policies, namely:
- - Final sterilization
- - No intervention (Laissez Faire)
- - Controlled cull

WTP (Question 9)

- We then asked through Question 9 to indicate the willingness to pay, for example through an increase in taxes, regarding the solutions proposed in Question 8.
- WTP average per capita of 21.87 euros per year
- 23% indicated 10 euros
- 42% reported a value of less than 10 euros
- (of which 20% indicated 1 euro)
- 35% indicated a value of more than 10 euros
- WTP residents of the municipality of Porto Torres: 32.70euros

Choice of alternatives

- ✓ The model is based on choices that are influenced by different attribute levels in the available alternatives, choices that consequently generate different probabilities of choice of alternatives.
- ✓ In order for the model, structured on multiple attributes and levels, to generate reliable estimates of the measures of interest, a large number of choices (sample observations) must be detected.
- ✓ The set of all possible combinations is defined as full factorial, which is all possible combinations of attributes and levels of an experimental design, which includes the main linear effects and inter effects. .

Hypotetical scenarios

4 attributes defined on 3 levels, the full factorial would consist of a total of 81 (3^4) possible combinations, which form an array of possible combinations.

	Levels		
Attributes	1	2	3
Increase local tax	0	10€	20€
Annual mortality rate of horses	10%	35%	60%
Increase of flora and plants (% of total)	0	2,5%	5%
Park management costs	0€	+80.000€	+160.000€

Each combination of different attribute levels can be an "alternative" to the status quo (highlighted in red), a hypothetical scenario of possible policies.

How to prepare the questionnaire

- ✓ After identifying attributes and levels and the functional form, we need to choose how to administer the questionnaire and detect the data of interest.
- ✓ The choice set scheme must be included in a questionnaire survey structure to provide information on the good (policy); to detect socio-economic characteristics of respondents; understand the motivations of the answers also through qualitative questions (follow up).
- ✓ It is important that the questionnaire begins with an introduction aimed at putting the respondent at ease, explaining the motivation of the research and its purpose, and detecting the neutrality of those who collect the data.
- ✓ The introductory section must present and provide information on the reference scenario on which the assessment is based, with a focus on the level of information provided.