"Capacity Building and Strengthening Institutional Arrangement"

Subcomponent Awareness Building

Presentation of methodologies and procedures to develop environmental questionnaires adopted by APAT

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1. Introduction (I)

Surveys on environmental issues for the environmental protection are strongly increasing in the recent last years

In order to develop communication campaigns to spread environmental information towards people, it is necessary to carry out preliminary surveys to evaluate what people think

These surveys are developed and managed with appropriate methodologies and tools, as questionnaires, as the examples at European and Italian levels seen during the previous presentations

In this module will be presented some methodologies and modalities that can be used to design environmental surveys through questionnaires

1. Introduction (II)

The organization of a survey concerning people's opinions, behaviours and attitudes is generally characterized by some specific steps, one regarding the design and organization of the survey and another concerning management and operative aspects:

1. The analysis of the environmental context

2. The design of the survey

3. The planning of the survey

4. The questionnaire design

5. The questionnaire administration

6. The collection and coding data

7. The analysis reporting and presentation of results

2. The analysis of the environmental context (I)

Usually the first phase of the organization of an environmental survey is to analyse the environmental context and to define the objective that will be focused by survey

With the analysis of the environmental context is possible to assess the main environmental problems of a territory and which kinds of environmental issues most effect and worry the population

For example, the APAT Service for the Promotion of Environmental Capacity Building has defined 8 thematic areas to "read" the protection of the environment, such as the following:

2. The analysis of the environmental context (II)

Four thematic areas about environmental matrices:

1) **Air:**Climatic characteristics, qualitative aspects, pollution caused by the main substances (gasses and powders), acoustic emissions.

2) **Water:** Physical – chemical – bacteriological characteristics of superficial and underground waters, water resources and consumption assessment, bathing waters quality.

3) **Soil:**Soil use and destination, geological hazards analysis, soil's physical – chemical quality, and pollution level caused by chemical products used in agriculture

4) **Nature and Biodiversity:** Habitats' Natural level, protected natural areas and biodiversity assessment, ecosystems' hazards and criticalities.

2. The analysis of the environmental context (III)

Four thematic areas about environmental antrophic effects :

5) Waste: Wastes' quantitative and qualitative evaluation, contaminated sites, waste management methodologies (collection, treatment, disposal) pollutant substances and pollution level per environmental thematic areas (air, water, soil, etc.) analysis of critical points and hazard level.

6) Energy and Radiation: Sources, productions and consumptions assessment.

7) Demography and Economy: Demographical aspects and quality mobility analysis, tourism, forest, agricultural, zoo-technical and ichthyic resources, landscape, archaeological, historical and cultural goods evaluation.

8) Environmental Culture and Sustainable Development: Available services, museums and centres, territorial associations, plans of sustainable development, adoption of European or national protocols.

3. The design of the survey (I)

After an analysis of the environmental context, is possible to define the objective of the survey, as the following example:

Choice of the survey's objective
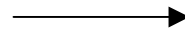
Example
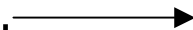
Survey's objective: citizen's perception of the environmental protection

1st thematic area: citizen's perception on air quality

The survey can be also divided in other subthematics:

2nd thematic area: citizen's perception on urban waste

3rd thematic area: citizen's perception on environmental damage

4. The planning of the survey (I)

In this phase of survey, it is important to define some preliminary aspects:

a) Definition of costs and times estimated to carry out the survey

Regarding these aspects is important to define at which territorial level (National, Regional, Local, Urban) the survey will be carried out and which public Authorities will be involved.

For example, the survey "Representation of public environmental institutions by citizens" (already presented) was carried out by the Service for the Environmental Capacity Building of Apat with the support of 10 Regional and Provincial Agencies (ARPA-APPA)

4. The planning of the survey (II)

In the Egyptian context a survey on environmental issues could be developed, for example, by Environmental Institutions in cooperation with Local Authorities, Universities and centres of research. Another important aspect is the timing of the survey. In fact, in order to have significant data about public opinion it is needed to define previously the time of every step.

For example, concerning the survey "Representation of public environmental institutions by citizens" the survey was organized by APAT in the following way:

3 months: Development of the questionnaire, definition of the sample, meeting with the ARPA-APPAs to define the modalities to administer the questionnaire to the people

4 months: start of the interviews on the Italian territory (1500 people)

2 months: Analysis of the data obtained, development of graphics representations and reporting documentation, presentation of the survey in the 8th Italian Conference on Environmental Agencies

4. The planning of the survey (III)

b) Definition of the working-group that will follow the different phases of the survey

c) Definition of which 'population target' will be investigated by the survey.

For example the target can be chosen by age (youths, adults), sex (male and female), sector of activities (employers of environmental institutions or public authorities), place of living (urban or rural areas), etc..

d) Definition of sampling procedures and the sample size

(how many people it is necessary to interview, which kind of sampling frame to use, which statistic methods to use, etc..)

4. The planning of the survey (IV)

e) Definition of the main environmental topics and what kind of questions will be included in the questionnaire

f) Definition of which modalities to use to administer the questionnaire (face-to face interview, telephone interview, postal questionnaire)

In the following slides are presented some aspects of the questionnaires design, which modalities to use to administrate it, and some examples to define a sample.

Other aspects as the collection and coding data and results reporting will be presented in following awareness environmental modules

5. The questionnaire design
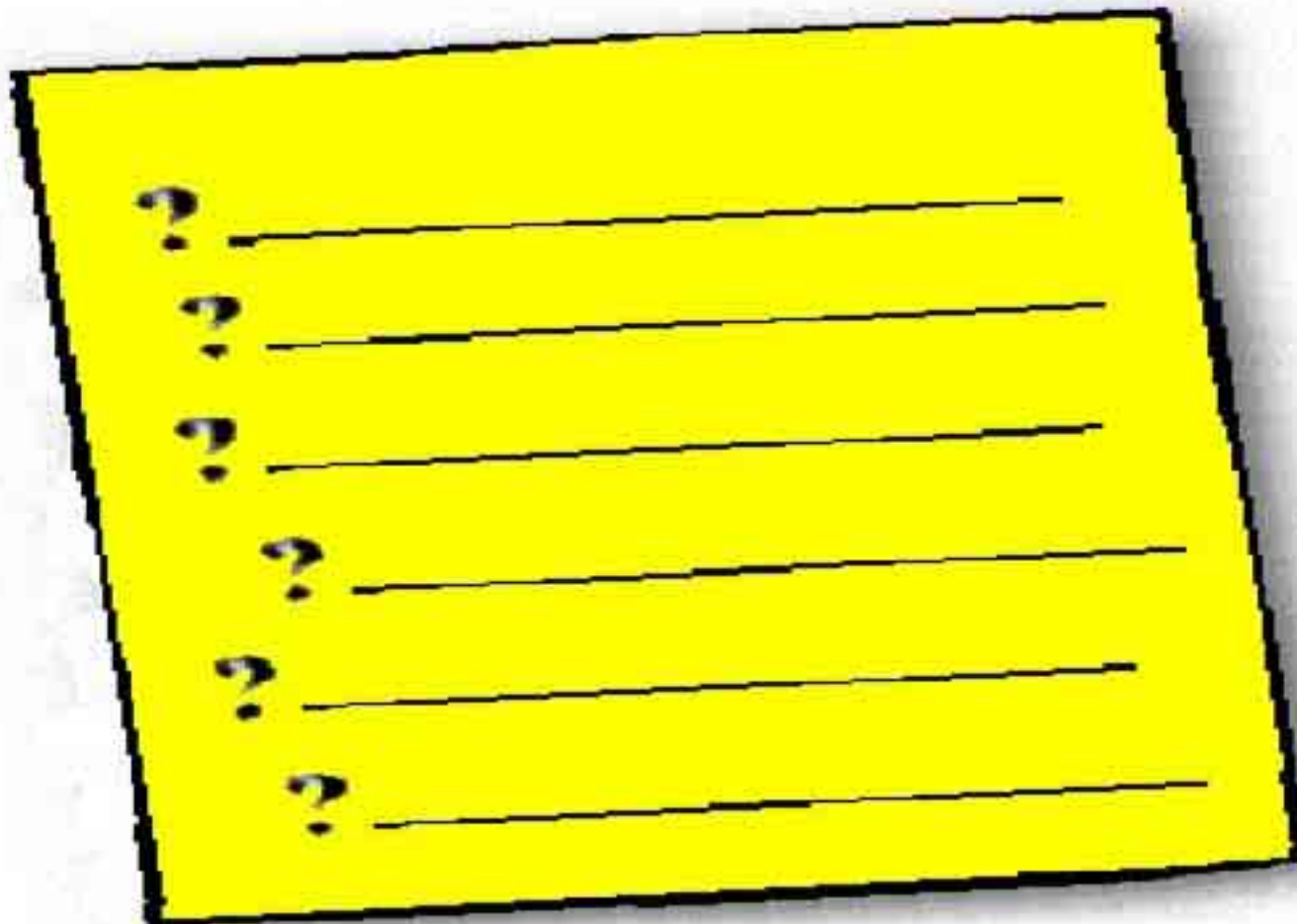
5. The questionnaire design (I)

The design of the questionnaire is one of the main phases of a survey.

The questionnaire is defined as a tool to collect information regarding the survey's object.

Therefore the questionnaire can be considered as a "measurement tool", because it can allow comparisons between the different answers obtained by subjects interviewed

It is also a "communication tool" because can provide information and data regarding the topics that are focused by the survey

5. The questionnaire design (II)

The structure of a questionnaire usually is composed by the following parts:

1) An introductive sentence about the context and the main objectives of the survey

2) Questions about socio-demographic variables of the subjects

3) Questions (closed/open/scales of measurement) about the specific survey's object

5. The questionnaire design (III)

After an introductive sentence, it is important to obtain information about the characteristics of the subjects, such as:

<u>Sex</u>: male;female

<u>Age</u> : young; adult; elder

<u>Level of education</u> : primary, secondary, diploma,degree,

<u>Typology of job</u> : non-active (students, unemployed, retired)

self-employed, employed

These information are relevant for the analysis of the data obtained, to evaluate if the results are affected by socio- demographics variables

5. The questionnaire design (IV)

Regarding the questionnaire design, there are 2 main kinds of modalities to formulate questions :

1. Closed questions

2. Open questions

5. The questionnaire design (V)

<u>Closed questions</u>

The 'closed questions' are questions where answers are prefixed and the subjects have to choose between one of the possible answers. These questions are used often to survey about opinions regarding facts and behaviours.

Example 1: "How often do you watch environmental programmes?"

Answer 1: very often   Answer 2: fairly

Answer 3: rarely   Answer 4: never

Example 2 : "At what level of environmental issues are you most interested in ?"

Answer 1: International level   Answer 2: National level

Answer 3: Local level   Answer 4 : I'm not interested

Example 3: "Have you ever read any environmental publications ?"

Answer 1: Yes   Answer 2: No   Answer3: I don't remember

5. The questionnaire design (VI)

Closed questions can be also defined on the basis of the number of the possible answers admitted, such as:

1. One response

2. Multiresponse

3. Hierarchized response

The following slides present some examples of these kinds of questions:

5. The questionnaire design (VII)

Questions with one response

"Have you ever watched environmental programmes?"

a)   Yes   b) Not

"Have you ever been in an environmental protected area?"

a) Never   b) Once c) Twice   d)more than Twice

The subjects can choose only one answer between the different options

5. The questionnaire design (VIII)

Questions with multiresponses

"Which kind of environmental issues are you most interested in ?"

(you can choose 3 answers)

a) Air   b) Water   c) Soil   d) Nature and Biodiversity

e) Waste f) Energy and radiation g) Demography and Economy

h) Environmental Culture and Sustainable Development

The subjects can choose more than one answer between the different options, according their opinions
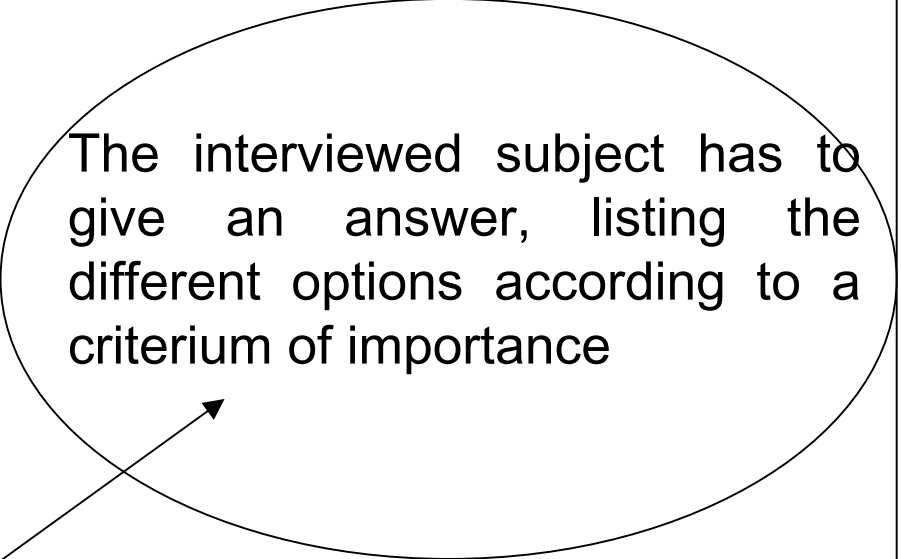
5. The questionnaire design (IX)

Hierarchized questions

"Using numbers from 1 to 5, can you list these environmental problems from the most urgent to the least urgent, according your opinion?"
(1: least urgent; 5: most urgent)

a) Air pollution   ☐

b) Urban Waste   ☐

c) Climate change   ☐

d) Water quality   ☐

e) Desertification   ☐

The interviewed subject has to give an answer, listing the different options according to a criterium of importance

5. The questionnaire design (X)

Advantages of closed questions:

• the possibility to compare the different subjects' answers

• the simplicity to codify the answers in a data-base

• the simplicity to evaluate the information obtained by closed questions

• the reduction of difficulties for subjects to elaborate their own answer as in the open questions

5. The questionnaire design (XI)

<u>Disadvantages of closed questions</u>:

• subjects couldn't find an appropriate answer with regard to their opinions between the prefixed answers

• subjects who don't have any or specific opinions about the topics asked could answer in a random way and not in rational way

• The possibility that during an interview by telephone, the subjects don't remember the prefixed answers, in case these are numerous (for example 4 and more). That means the necessity to repeat the question during the interview, with an increase of time and costs for the survey

5. The questionnaire design (XII)

Open questions

The open questions are questions that allow the interviewed to answer in any way they want and are mostly used when it is needed to ask questions about attitudes and perceptions

Example 1:

What do you think about the protection of the environment?
……………………………………………………………………………………………
……………………………………………………………………………………………
Example 2:

According to your opinion, which is the most urgent environmental problem in your Country?

……………………………………………………………………………………………
……………………………………………………………………………………………

5. The questionnaire design (XIII)

Advantages of open questions:

• Open questions allow subjects to specify every detail and explanation of their points of view (instead of closed questions).

For example, with the question "which is the most urgent environmental problem in your city?" it is possible to discover other aspects and problems, that with prefixed answers could be lost

•The open questions can provide more information than the closed questions

5. The questionnaire design (XIV)

Disadvantages of open questions:

• The general increase of costs and times of the different survey's phases

•Long time for the coding phase, due to the difficulties to standardize all the different answers given by subjects (including different styles of communication)

• The difficulty to elaborate statistical comparison

• An higher percentage of people who refuse to answer because the interviewed couldn't want spend a lot of time in answering to the questionnaire

5. The questionnaire design (XV)

Closed – Open question

Usually the 'open questions' are particularly useful for explorative surveys, when it's needed to collect all the available information and details about the survey's objective

The 'closed questions' are preferred when it is needed to collect measurable and comparable data and are mostly used with people who have a low-medium level of education, because closed questions need few instructions to be compiled

Finally, it is important to underline that questionnaires are often composed by both of these 2 modalities, in order to have statistic data and more detailed opinions about the survey's objective

5. The questionnaire design (XVI)

Scales of measurement

When the questions concerning specifically ideas, attitudes and opinions, there is the necessity to assign numeric values to subject's opinions

In this context it is important to have appropriate tools to collect, codify and analyse subjects answers

Social science have elaborated scales of evaluation (measurement) of opinions and attitudes, and usually the most used are the following:

1. Likert scale

2. Semantic differential

5. The questionnaire design (XVII)

Likert Scale

The Likert scale is a methodology based on a list of items (statements) to measure people's attitudes about specific topics or concepts.

Regarding the procedures it is needed to choose a topic to investigate (e.g: 'people attitudes towards environmental protection') and to prepare a list of statements about the topic chosen.

The subjects have to answer to different statements, choosing between 5 possibly options: 'strongly agree', 'agree', 'uncertain, 'disagree', 'strongly disagree', as the following example:

Example1 : "Regarding the proposal to institute the environmental education at school, you are:"

□ 5 strongly agree □ 4 agree □ 3 uncertain □ 2 disagree   ⟶ statement

□ 1 strongly disagree

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5. The questionnaire design (XVIII)

Example2

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
For each of the statements below, please indicate the extent of your agreement or disagreement by placing a tick in the appropriate column					
1. The environment should be protected					
2. People who damage environment should be fined					

At each answer is assigned a score (5, 4, 3, 2, 1) that allows to develop a scale to measure people's opinion on the topic investigated to study the different attitudes of subjects and groups concerning specific environmental issues.

5. The questionnaire design (XIX)

The Semantic Differential (SD) technique measures people's reactions between 2 contrasting adjectives about a specific topic.

In the SD people have to indicate their opinions on a linear scale choosing between 7 labels (categories). The label ' 0' is considered as a neutral opinion, while the label '3' is it considered as an extreme opinion (positive or negative)

Example: Topic – Protection of the environment

Ineffective								Effective
	3	2	1	0	1	2	3	
Unnecessary								Necessary
	3	2	1	0	1	2	3	
Useless								Useful
	3	2	1	0	1	2	3	

6. The questionnaire administration

6. The questionnaire administration(I)

After the design of the questionnaire, it is needed to administrate it to the people and usually there are 3 different modalities :

- face-to-face interview

- telephone interview

- autocompilation (postal questionnaire)

6. The questionnaire administration(II)

Face to face interview: with this modality expert interviewers contact people to arrange an appointment to administrate the questionnaire and usually this interview takes place inside people's houses

Advantages:

•interviewers can repeat the questions in case the respondents don't understand or misunderstand
•interviewers can explain questions that appear not clear
•high % of answers to the questionnaires is obtained

Disadvantages

•high costs and long time to carry out the interviews

•possibility of the interviewers to affect subject's answers

6. The questionnaire admnistration (III)

Telephone interview: with this modality people are contacted by phone to answer to the questionnaire. This technique is the most used to contact the population

Advantages:

•low costs and saving time to interview people
•possibility to interview people who usually don't want arrange an appointment in their houses
•it permits to reach large sectors of the population to be interviewed

Disadvantages:

•people who don't have phone can't be contacted
•low % of answers to the questionnaires
•difficulty to repeat or to explain questions by phone

6. The questionnaire admnistration (IV)

Autocompilation (postal questionnaire):
with this modality the questionnaire is sent to the people's address (included a letter of presentation and instructions) that have to compile it by 1-2 weeks and to send the questionnaire back to the institute which is doing the survey
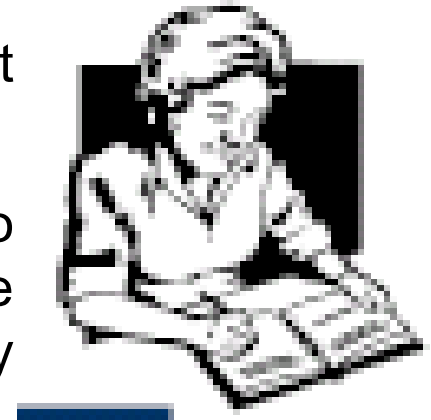
Advantages:

•subjects can answer when they want

•low costs of the survey

•lack of affect by interviewers towards respondents

Disadvantages:

•high % of questionnaires that don't return back

•possibility that people who answer to questionnaire are not the same indicated by sample

6. The questionnaire administration (V)

Regarding how to promote the questionnaire towards people, it is needed to explain to the subjects (interviewed) the following aspects:

1) The objectives of the survey, the institution or the firm that is promoting the survey and the importance to involve the subjects to answer questions

2) The guarantee of the anonymity of the subjects regarding answers and opinions expressed

3) The respect of the privacy regarding personal data of the subjects

6. The questionnaire administration (VI)

An example of an introductive sentence at the beginning of the questionnaire could be formulated in this way:

"Good Morning Mr/s… I'm calling on behalf of the… Environmental National Agency to ask some questions about the people's attitude towards environment

Your opinion it's useful for the planning of appropriate public activities and campaigns regarding environmental protection.

All the information you will provide to us are strictly confidential and will be used only for statistical data"

6. The questionnaire administration (VII)

An example of question about socio-demographic characteristics could be formulated in this way:

"Before beginning the questionnaire, I would like to ask some questions for statistic purposes. Could you tell me:".

- What is your study title?
- What is your activity?
- If student, what kind of study do you attend?
- Date of Birth
- Gender

Well, we can begin the questionnaire"

7. The sample

7. The sample (I)

During the different phases of the survey an important step is the definition of the sample

Due to the lack of availability of time and the high costs a survey can't be carried out on the whole population but it is needed to define a group of people representative of the 'target population' of the survey: that is the sample to whom will be administered the questionnaire

For example, in case of a survey concerning "environmental perceptions of Rome's citizens", the sample will be composed by a small number of people who have the same characteristics (social, demographics,sex..) of the target population (4 millions of inhabitants)

7. The sample (II)

The sample is the process of selecting a smaller number of people from a target population chosen, so that by studying the sample it is possible to generalize and to extend the results towards the whole target population
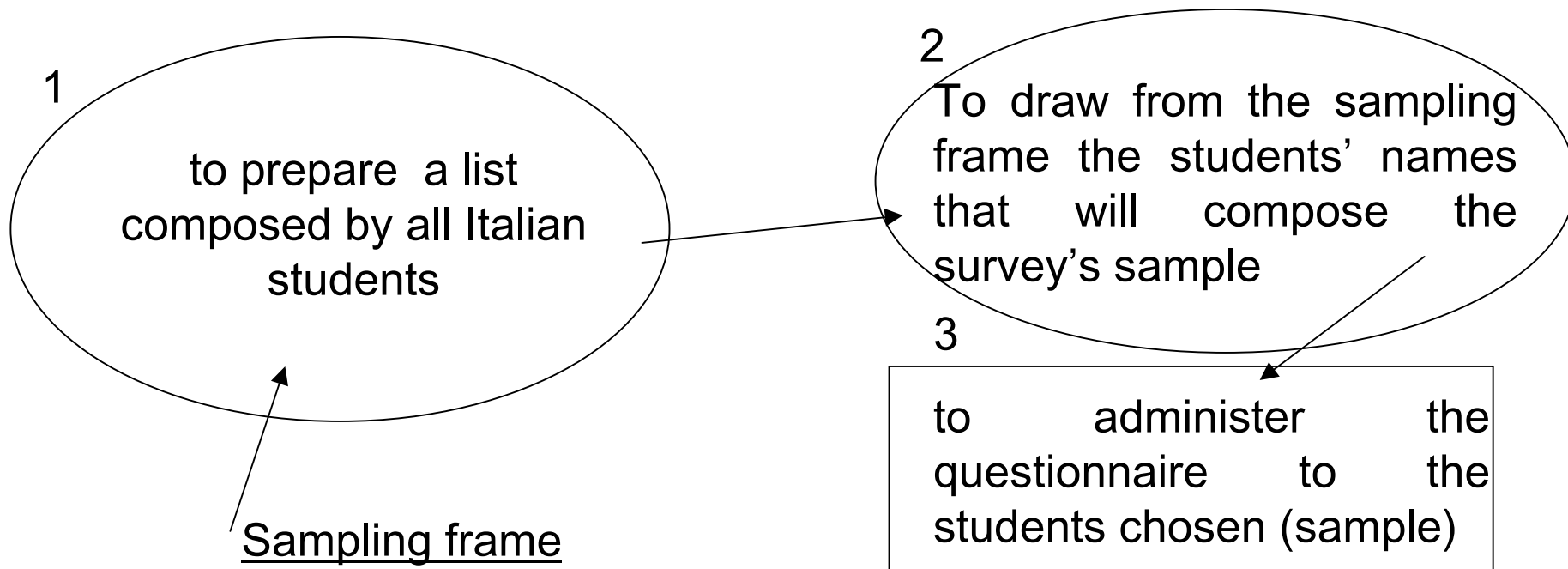
The sampling process is composed by 2 steps:

1) Carrying out of the <u>sampling frame</u>, that is the list of the population from which the sample is drawn. The sampling frame can be represented by <u>census</u>, <u>electoral register</u> (but there aren't included young), <u>telephone directory</u> (but there aren't included people who don't have phone), <u>births registers</u> , or unifying all these sources of information

2) Carrying out of the <u>sample</u>, drawing by sampling frame the subjects that will compose the sample of the survey, by means of different statistical techniques
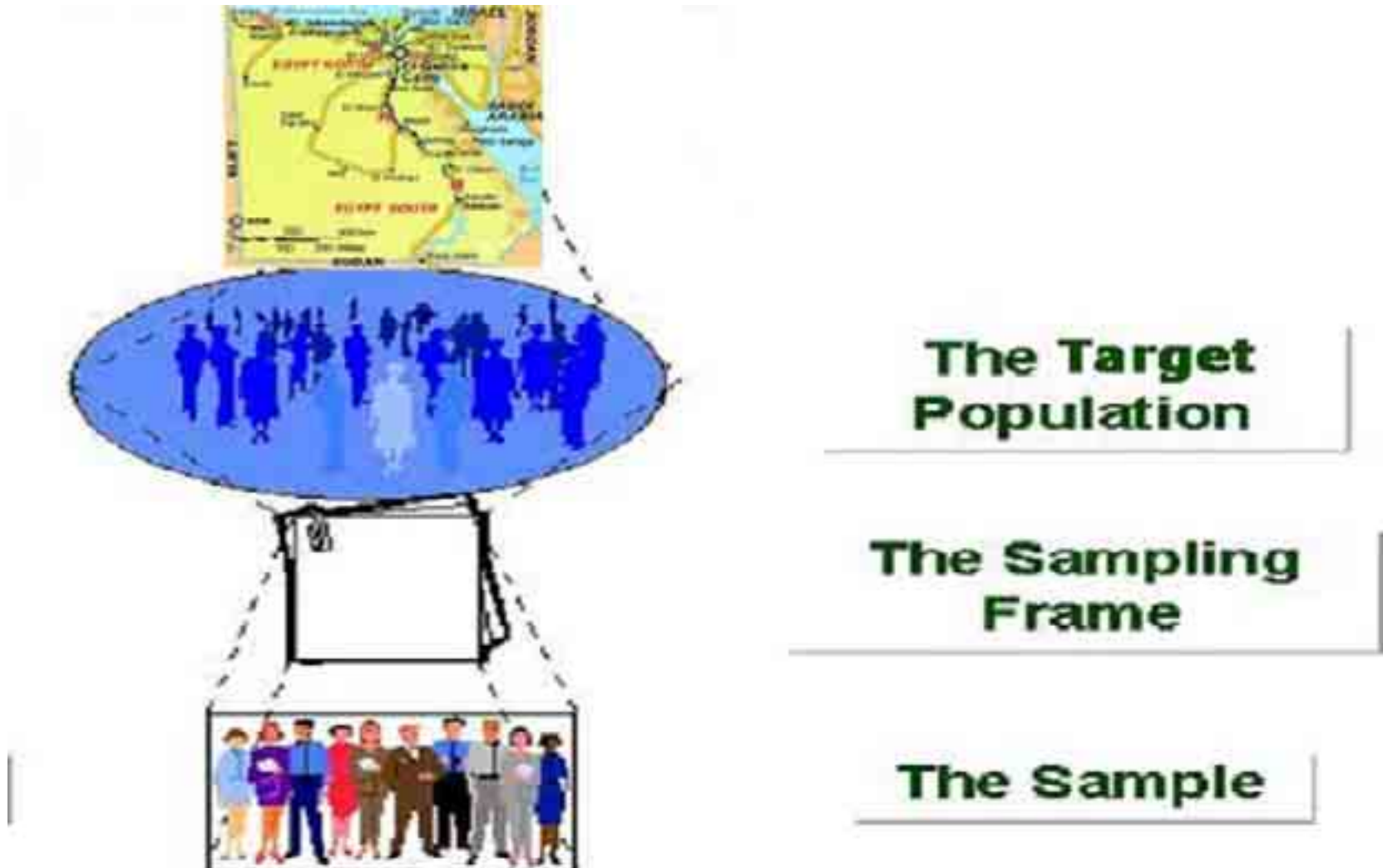
7. The sample (III)

Example : how to carry out a <u>sampling frame</u>

In order to develop a survey to analyse Italian students' opinions about environmental protection, it is needed:

1 to prepare a list composed by all Italian students

2 To draw from the sampling frame the students' names that will compose the survey's sample

3 to administer the questionnaire to the students chosen (sample)

<u>Sampling frame</u>

7. The sample (IV)

This figure shows the process already described

The Target Population

The Sampling Frame

The Sample

7. The sample (V)

Regarding how to choose the sample there are 2 kinds of methodologies. The aim is to obtain a sample representative of the target population chosen:

1. Probabilistic samples

    Every member of a target population has the same probability to be included in the sample.

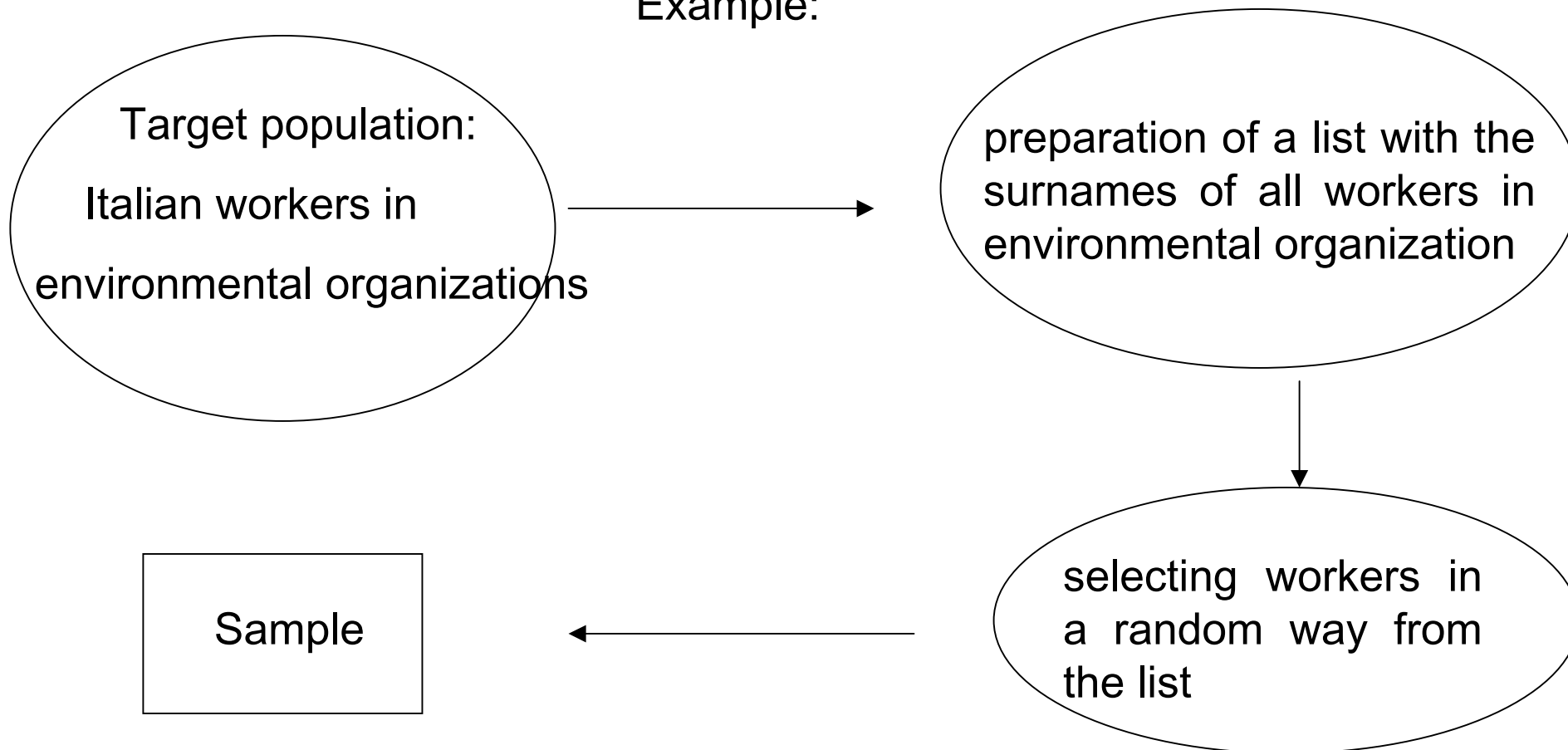2. Non probabilistic samples

    This type of samples are used when the target population of the survey is very specific

In the following slides are presented some methods to define samples

7. The sample (VI)
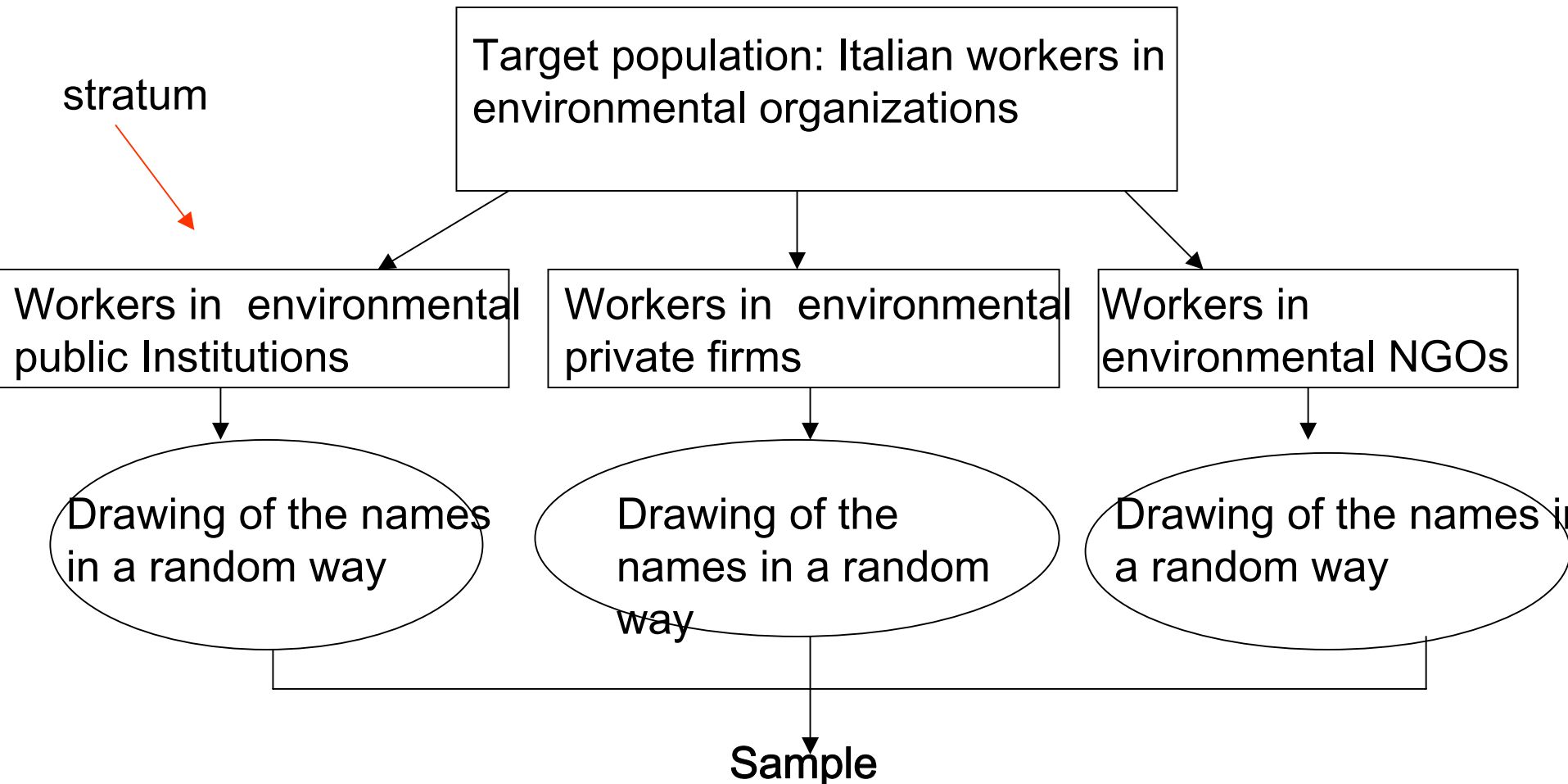
Within the probabilistic samples there are different methods. The most used are random and stratified samples.

Example:

Target population:

Italian workers in

environmental organizations

preparation of a list with the surnames of all workers in environmental organization

selecting workers in a random way from the list

Sample

7. The sample (VII)

2) stratified sample: in this case the target population is subdivided into subgroups called 'strata', and each stratum is sampled separately

stratum

Target population: Italian workers in environmental organizations

Workers in environmental public Institutions

Workers in environmental private firms

Workers in environmental NGOs

Drawing of the names in a random way

Drawing of the names in a random way

Drawing of the names in a random way

Sample

7. The sample (VIII)

Regarding the non probabilistic samples, the most used methods are :

1) <u>Convenience samples</u>: with this technique the sample will be formed by all the people who are available to answer to the questionnaire. In this way costs and times are strictly reduces but the sample is not very representative

2) <u>Snowball samples</u> : this technique it is based on asking people who have just answered to the questionnaire to nominate other people that could be interested to take part in.

7. The sample (IX)

Finally it is necessary to define how many people are needed to interview to have a significant sample?

Generally there aren't prefixed rules, the definition of a sample is related with different factors, such as the quantity of the target population chosen, finance and time availability, preparation of the staff, etc..

However social science experts agree that a good sample regarding survey towards citizens usually could be defined between 500- 2000 subjects

Finally it is important to have in the survey's staff statistic experts who can support the working-group during the different phases of the sample definition

8. Working-group presentation

All these aspects will be faced by a specific working-group promoted by APAT and EEAA to design and carrying out questionnaires on environmental protection issues, based on the theory and methodological aspects presented

Particularly, the working-group will define:

•the environmental thematic areas to investigate, based on the Egyptian context

•the development of a questionnaire composed by 10-15 questions regarding environmental protection topics

• the target population which to administer the questionnaire
At the end of the activities, will be presented and analysed the questionnaires carried out