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Evaluation of training, monitoring outcomes
and existing routines adaptations needs.

ECOMED - Ecoengineering in the Mediterranean Environment

SECTOR NEEDS REPORT

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Summarize Info

Project title

ECOMED

WP reference

WP2 Research and assessment of needs

Task reference

Task 2.1

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1. ABSTRACT

The aims of the project are:

- Generate new alliances and dynamics between Mediterranean higher education institutions and ecoengineering enterprises.
- Increase the specialization level of the soil and water ecoengineering sector within the Mediterranean ecoregion.
- Analyse the ecoengineering works evolution.
- Offer innovative and more effective teaching and learning techniques in soil and water ecoengineering.

This document reports the results of the survey to check the sector needs and to update the skill needs on the Mediterranean ecoengineering sector.

It has been addressed to people, companies and institutions linked to the field of soil and water ecoengineering, as designers, private companies, people working in academic and research institutions, contractors and subcontractors, local governments, suppliers, university undergraduated and graduated students, within the European countries involved in the project.

The survey was conducted through five online questionnaires.

The aim of each questionnaire was to better understand the current state, the future needs and changes to be undertaken by the soil and water bioengineering sector across a range of Mediterranean countries including Spain, France, Italy, Portugal, Turkey, FYROM and Greece at the different stages.

The 5 questionnaires were:

- A design stage including 37 questions. 116 responses;
- A construction stage including 31 questions. 49 responses;
- A monitoring stage including 26 questions. 39 responses;
- A training stage including 26 questions. 84 responses;
- A company/enterprise stage including 20 questions. 47 responses;

About 335 valid questionnaires were totally filled in by respondents mostly belonging to the seven Mediterranean countries involved in the project.

2. INTRODUCTION

This document reports the results of needs assessment conducted within the framework of the ECOMED Project, Work Package (WP2), Task 2.1. The assessment represents one of the first steps of the ECOMED project and tries to check the sector needs and to update the skill needs on the Mediterranean ecoengineering sector.

Ecoengineering is gaining more acceptances in the Mediterranean but it is essential to acquire more feedback from the stakeholders. To achieve this, an online questionnaire was developed and answers from stakeholders from different countries were collected.

The results in each part were summarized and analysed. This allows comparing the current sector needs among the different countries involved in the ECOMED project;

This information is valuable to define a sound foundation for cooperation and generation of useful dynamics within the Mediterranean soil and water bioengineering sector;

These reports will also be utilised both in meetings with sector stakeholders and in the workshops organised within ECOMED project framework.

2.1 Objectives

The survey was aimed to better understand:

- the need and benefits, routines and procedures of the soil and water bioengineering sectors, at the design stage, the construction stage, the monitoring stage, the training stage and at the companies/enterprises stage;
- the current sector state of art, the need and benefits of new international dynamics within the sector;

It was addressed to companies and institutions linked to the field of soil and water ecoengineering, to designers, specialists of the sector, private companies, people working in academic and research institutions, contractors and sub-contractors, local governments, suppliers, university students undergraduated and graduated, within the European countries involved in the project.

3. STRUCTURE AND CONTENTS OF THE REPORT:

The report consists of the following main sessions:

- *Part 1*, chapters:

1) Abstract

2) Introduction

3) Structure and contents of the report.

This session, introduces background information and objectives. It also describes the structure and the main contents of the report.

- *Part 2*, chapter:

4) Methodology.

This session presents the methodological approach adopted for the aims of the research, highlighting the tools used during the survey.

- *Part 3*, chapters:

5) Results

6) Conclusions

In this session were summarized and discussed the main research findings (highlighting the most relevant results by tables and charts), and were drawn some conclusions based on the answers of the participants and on some statistical analysis of the charts at the different stages.

- *Part 4*, chapters

7) References

8-14) Annexes. Were provided the full questionnaire used for the survey and the full answers.

4. METHODOLOGY

The study was performed through five online surveys conducted in June 2017.

In order to have more answers to the surveys, the dead line of the questionnaires was postponed at 15th July.

After this date, the results of the surveys were sent to all partners, and the most interesting points of each questionnaire were discussed in focus groups which each partner country held at the end of July.

The surveys were delivered in English via Google Forms, and the questionnaire was structured into the following parts:

1. Personal info and background
2. Technical and specific skills

In the First part, personal info about respondents was collected (nationality, age, gender, etc.).

In the Second part of the questionnaires was investigated the state of the art of the sector in each country, with particular attention to the technical rules and needs of training courses.

In the questionnaires there were many multiple choice qualitative answers (as yes, no, I don't know), many multiple choice quantitative answers (values from 1 to 5), and some open questions (at the end of each questionnaire there was an essay question in which each respondent person could describe his proposed specific changes, needs or new approaches on the interested level).

About the open questions we realised they were useless, because the answers were written in many different languages (most of the respondents answered into his own country language), and also because they didn't allowed us to make any statistical report.

The questionnaires were circulated through Google Form via project partners.

The use of the Google Format had many positive sides, as:

- the way of communication was very useful because it allowed us to disseminate the questionnaires very quickly;
- each project partner made the questionnaires circulate among their stakeholders and the answers were directly collected by the respondent partner.
- it was possible to download the answers in Excel format, and this allowed the writers to easily work on the answers with charts and numbers.

Copies of the questionnaires used for the survey are available from Annexes 1 to 5.

5. RESULTS

A total number of 335 questionnaires were completely filled in by respondents, and the analysis and elaborations and some remarks are below reported.

The most representative questionnaire was the design stage.

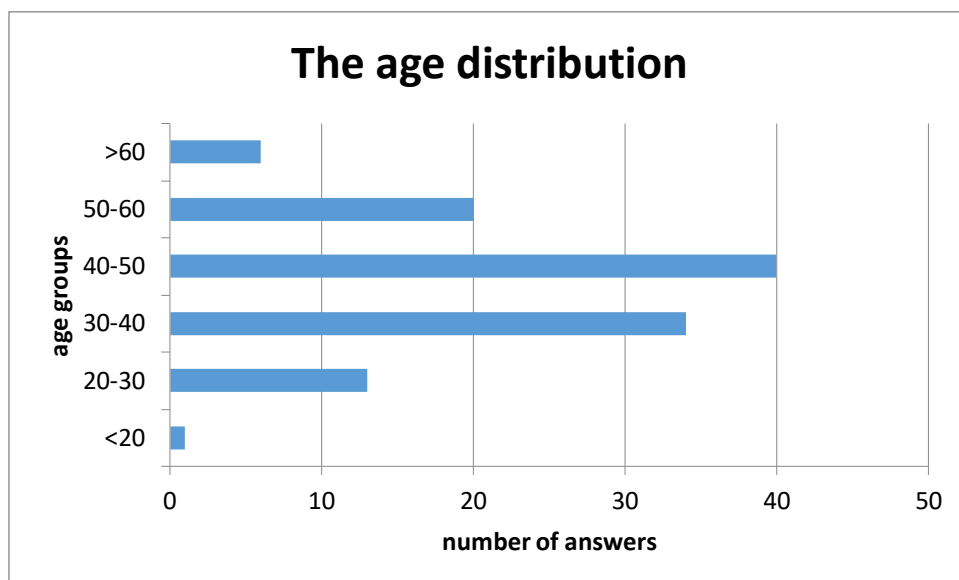
All the respondents gave an answer to this stage, which is the most representative among all.

For this reason we got the personal info of respondents from this stage.

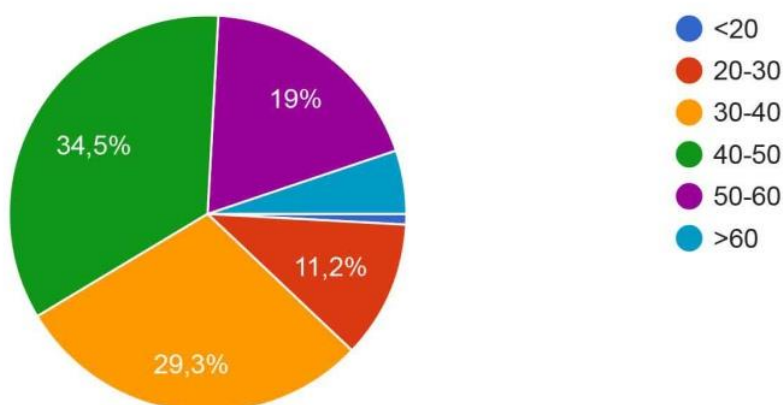
5.1 Personal info: general information on respondents.

5.1.1 The age distribution

Most of the respondents are aged in the 40-50 years group.



Most of the respondents are aged between 30 and 50.

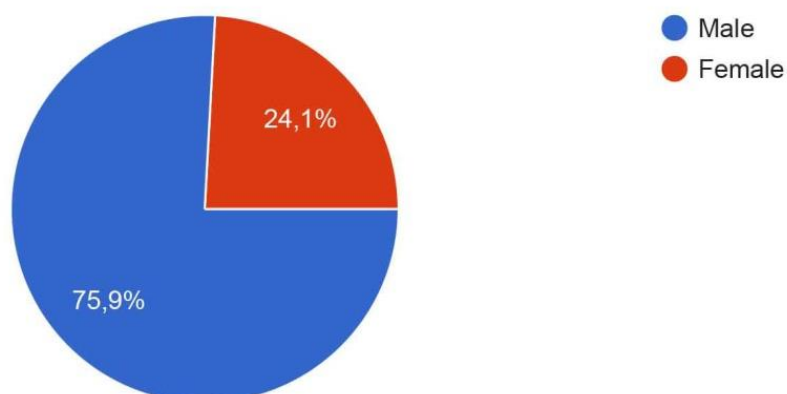
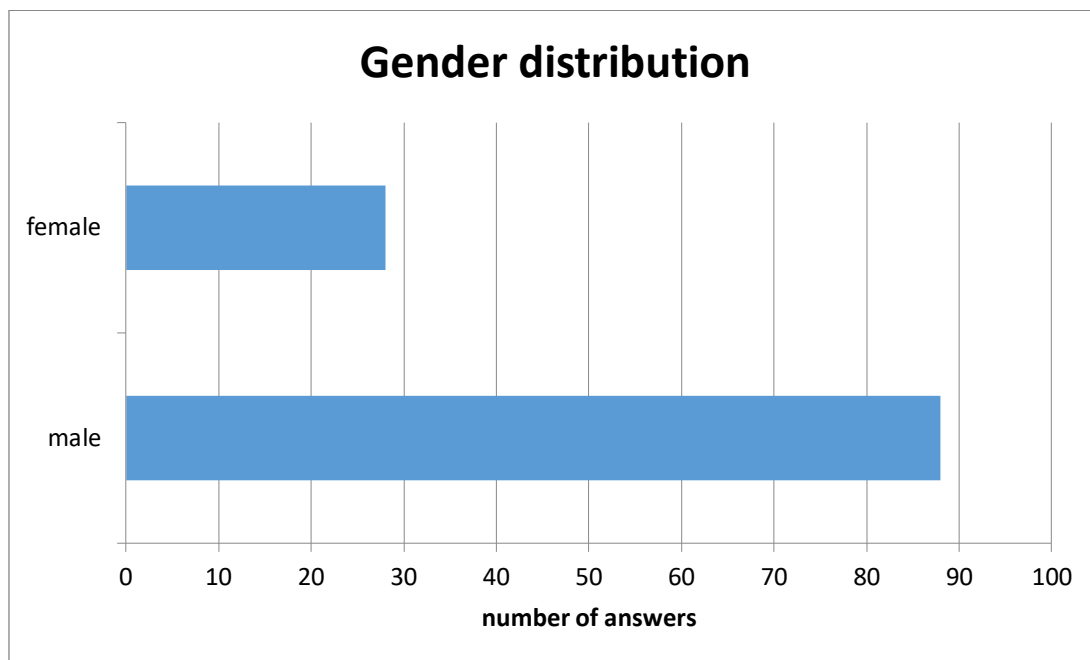


Most of the respondents are aged between 30 and 50. We have tested the null hypothesis (H_0 = no relationship between age group and nationality) with χ^2 test. We have $\chi^2 = 41.9$, $\chi^2_{0.95} = 36.4$, $\chi^2_{0.99} = 41.6$; so we can say that we can refuse the null hypothesis. On the other hand, the coefficient of contingency derived from observations is $C = 0.53$.

We can conclude that, if there is a relationship between age group and nationality, this is of medium intensity.

5.1.2 The gender distribution

Most of the respondents are male



5.1.1 The country origin

Most of the respondents are from Greece and the fewest from FYROM.

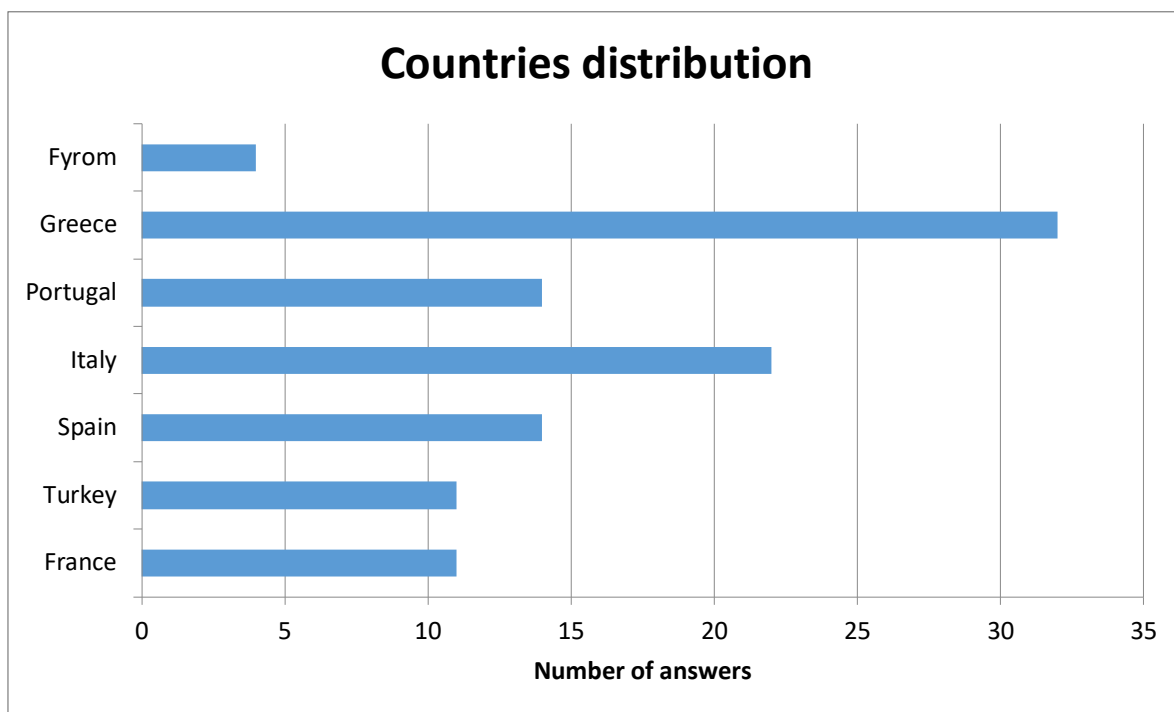
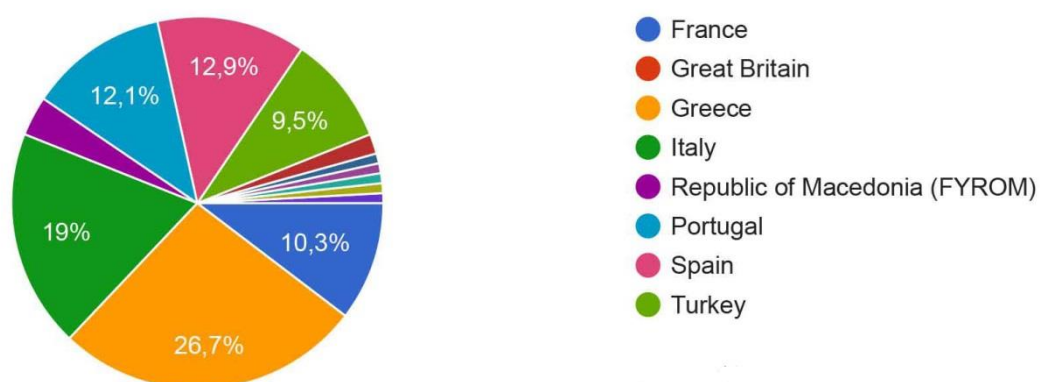
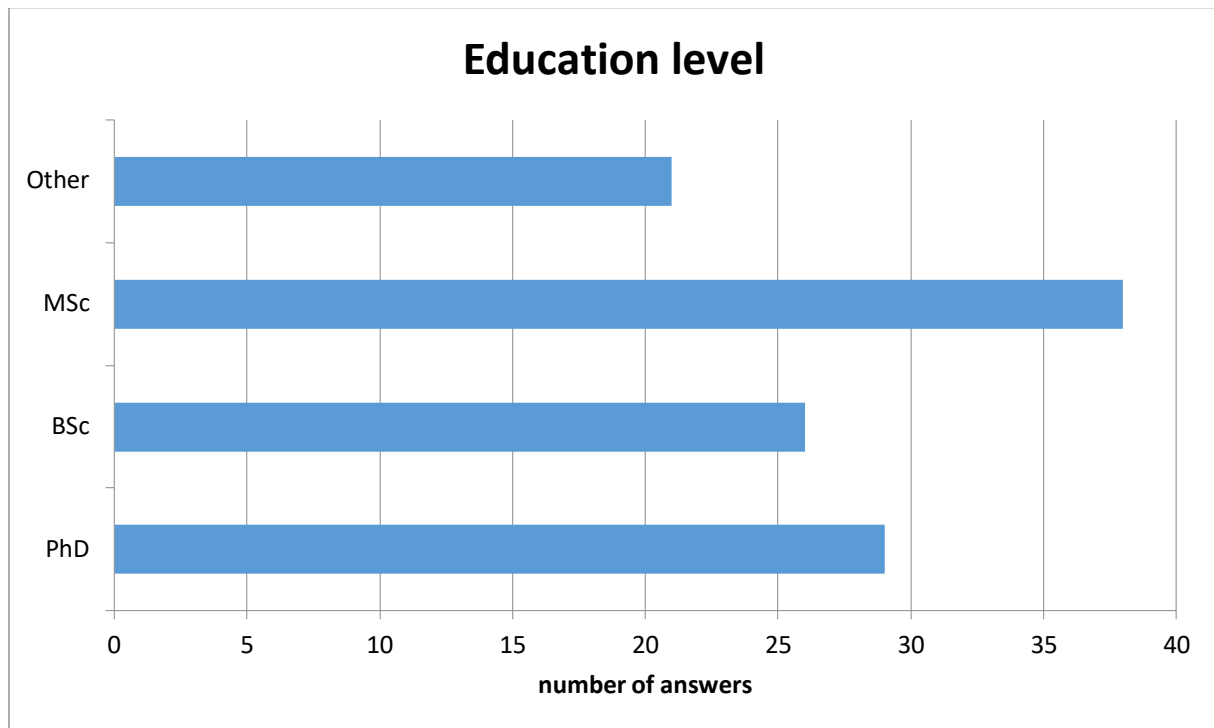


Figure C2



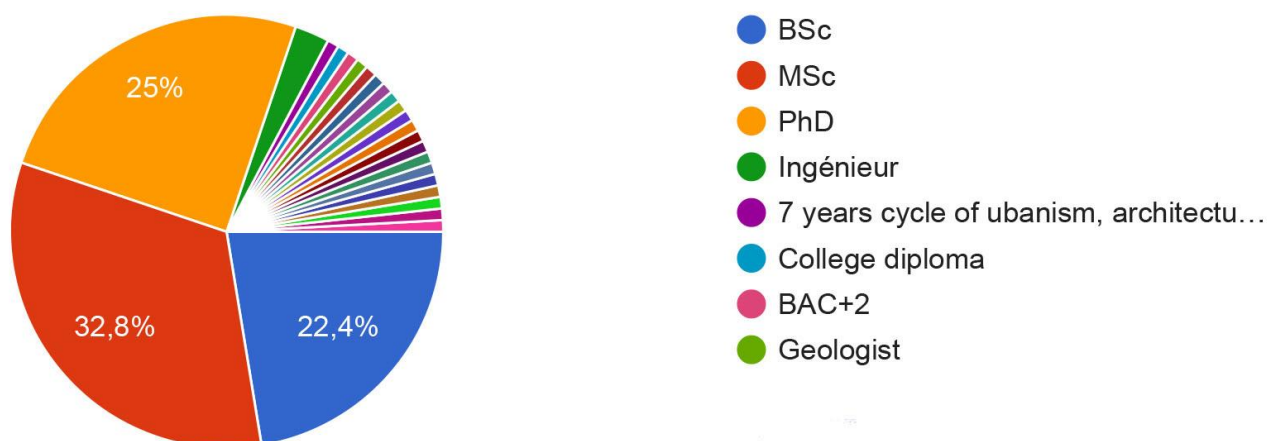
5.1.2 The education level

Most of the respondents have an MSc degree



We have tested the null hypothesis (H_0 = no relationship between education level and nationality) with χ^2 test. We have $\chi^2 = 27$, $\chi^2_{0.95} = 28.9$; so we can say that we can't refuse the null hypothesis. On the other hand, the coefficient of contingency derived from observations is $C = 0.45$.

We can conclude that, if there is a relationship between education level and nationality, this is quite weak.



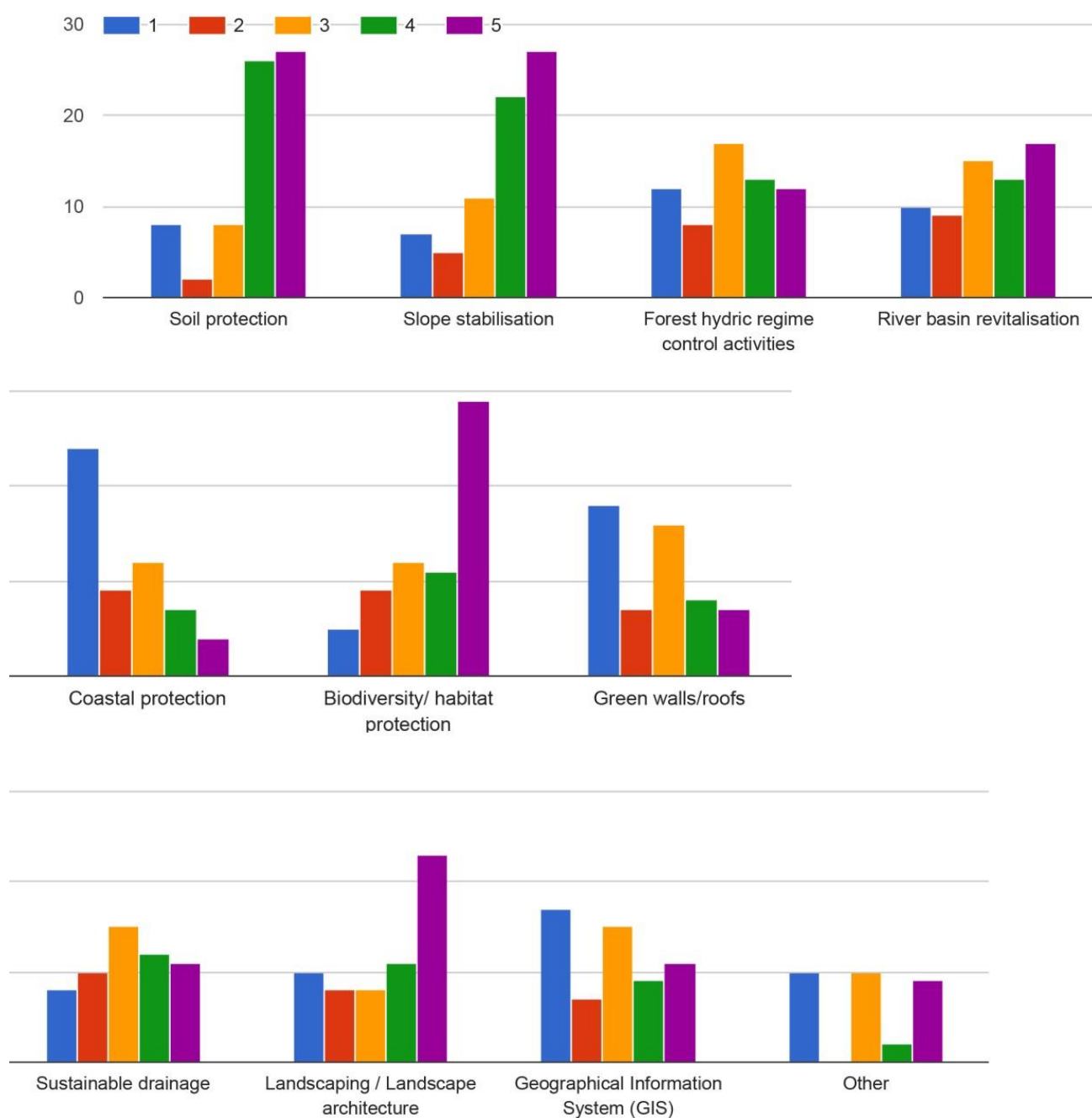
5.2 Remarks

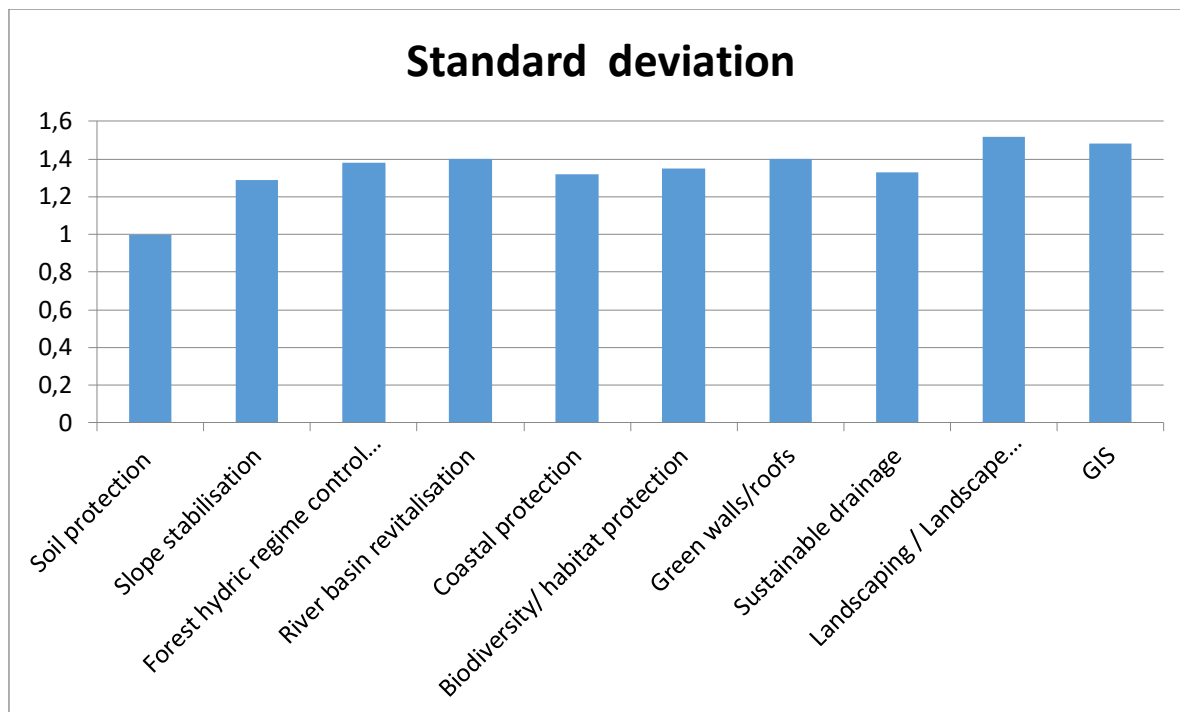
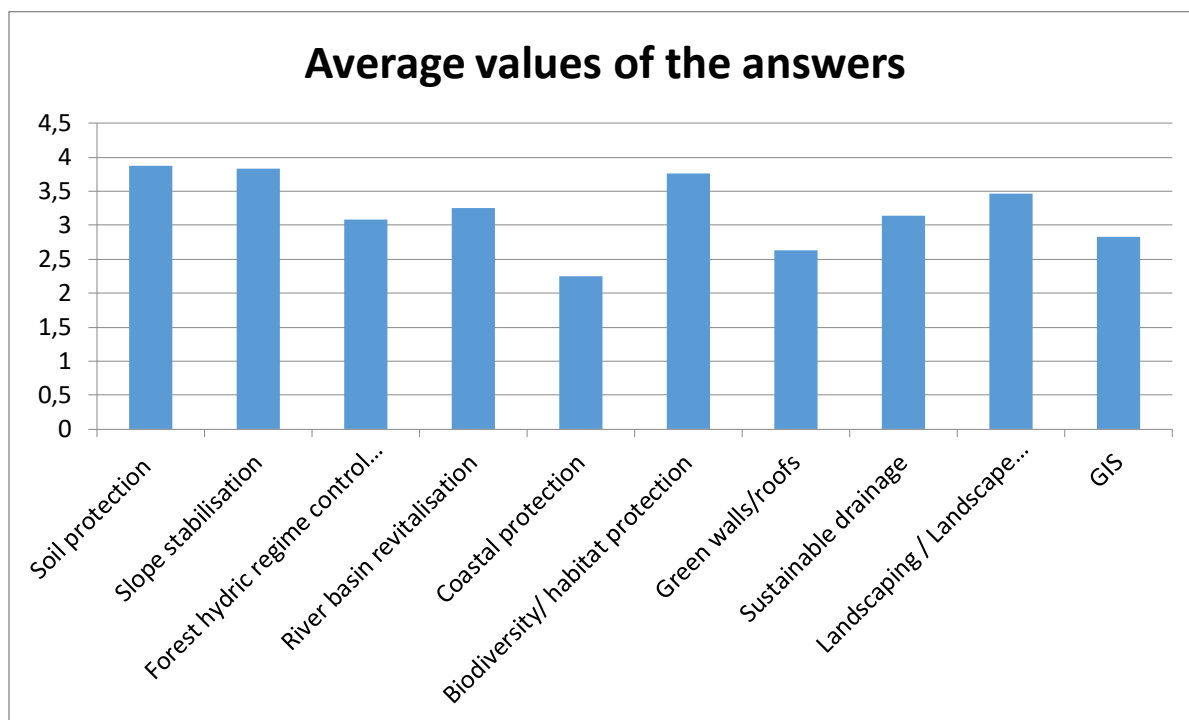
5.2.1 Remarks on the design stage:

There were totally 116 answers to this stage.

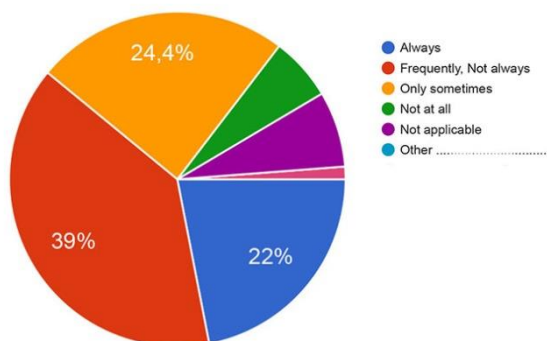
1) Mostly of the respondent persons are working on (in order of importance) (answer n° 1):

- Soil protection.
- Slope stabilisation.
- Biodiversity/habitat protection.
- Landscaping.
- River basin revitalisation.

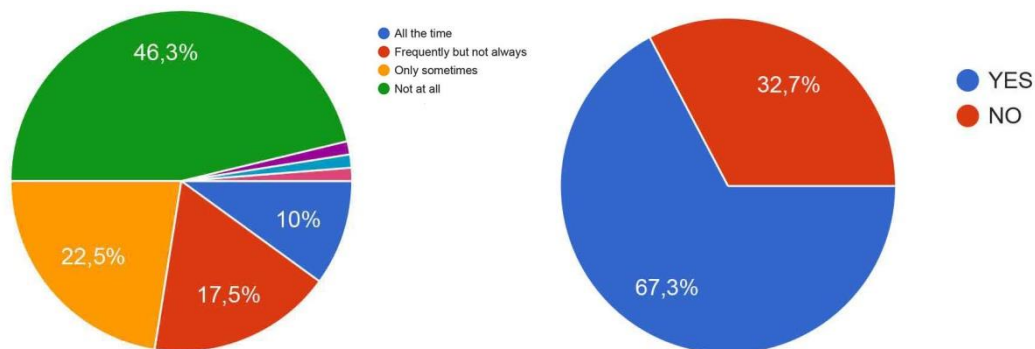




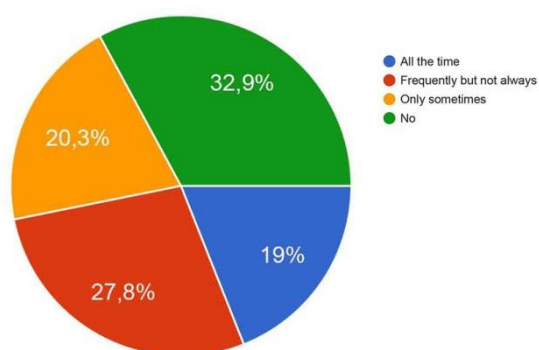
2) Only the 22% tackles easily the soil-water bioengineering works (answer n° 7).



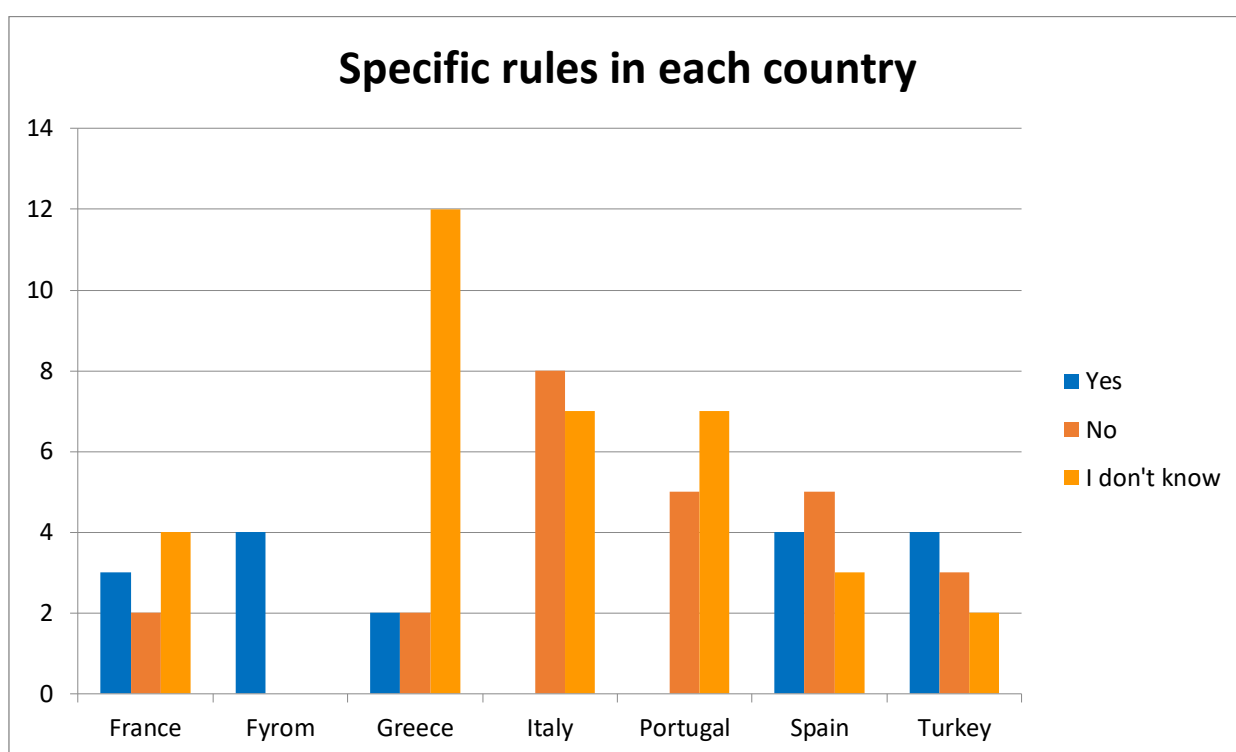
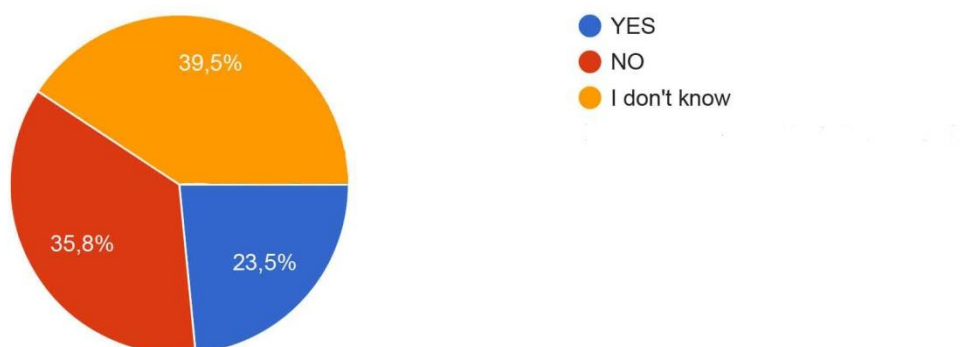
3) Only the 10% of the respondents use some software all the time, and the 67% is satisfied by the performances of this software.(answers n° 12-14).



4) Only the 19% Always use manuals or guidelines in their designs...(answer n° 16)."

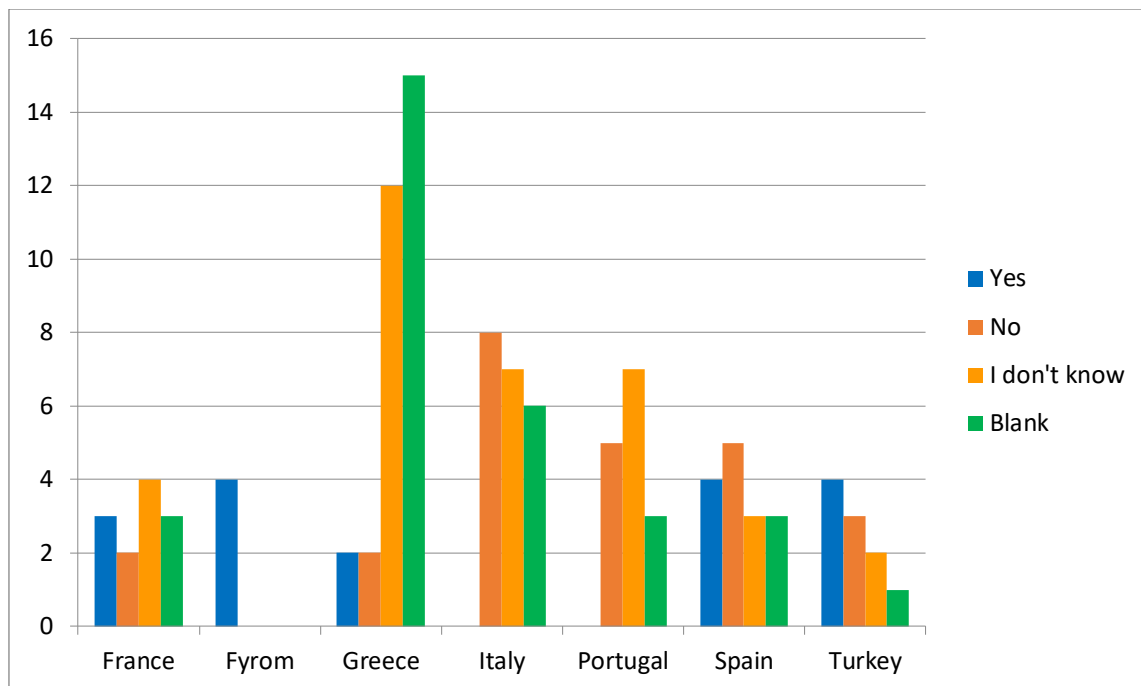
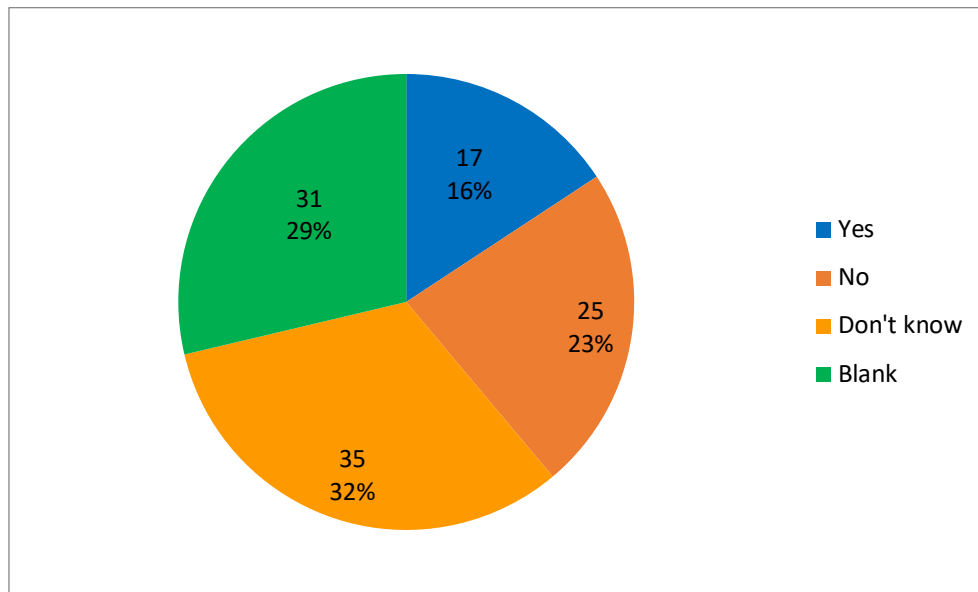


5) Most of the respondents don't know if specific regulations exist in their country. (answer n° 20).

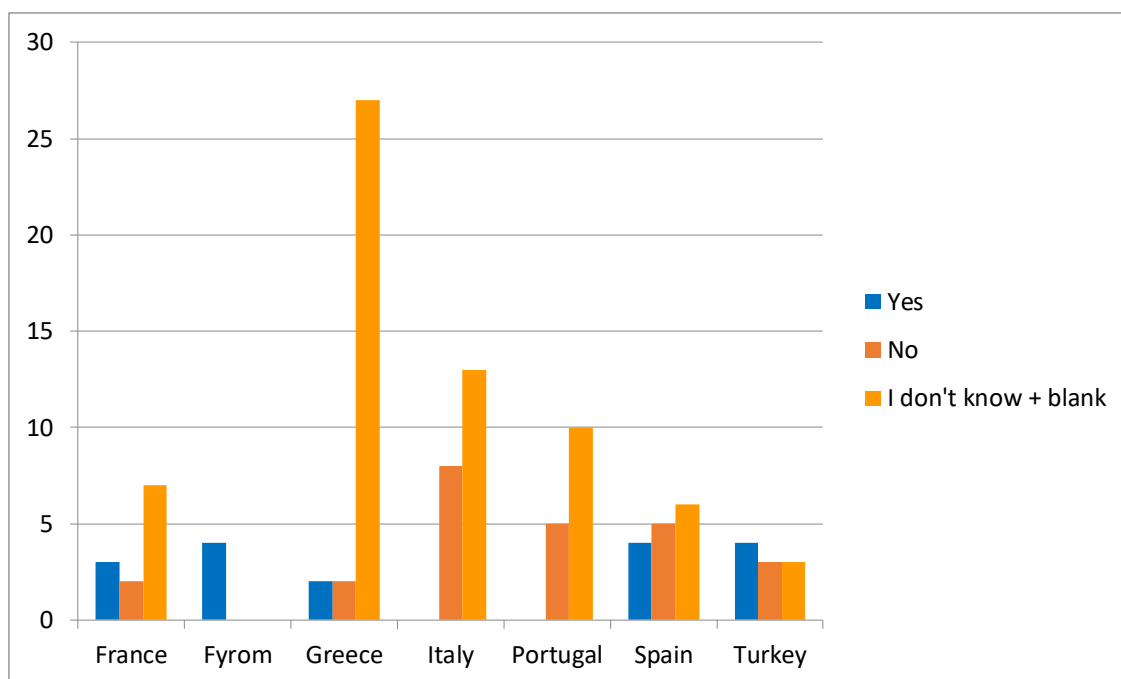
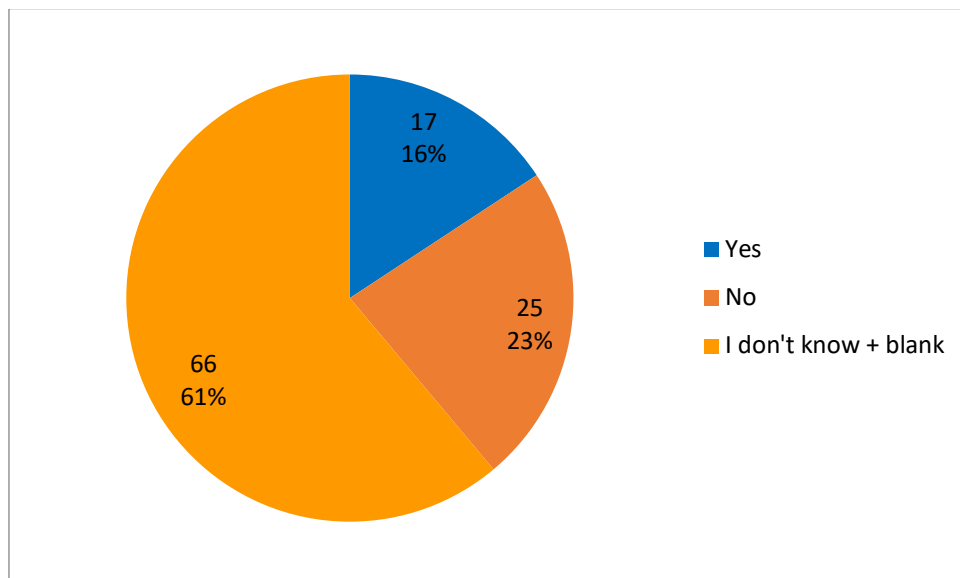


...but many others didn't answer.

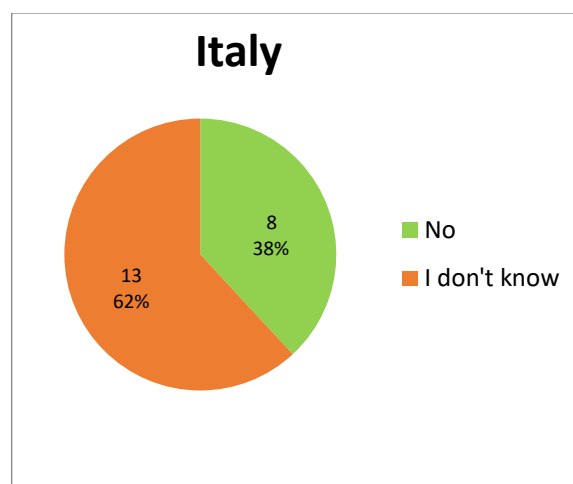
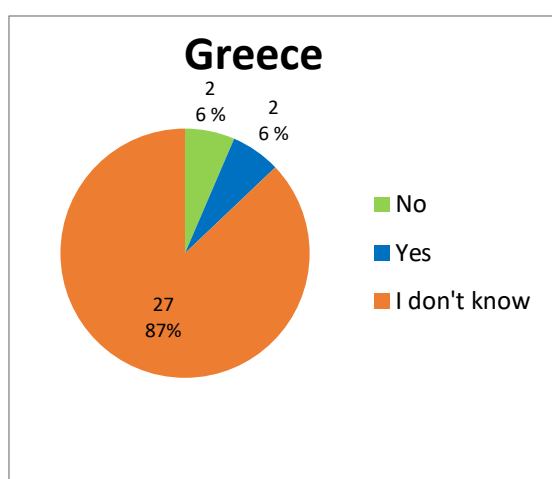
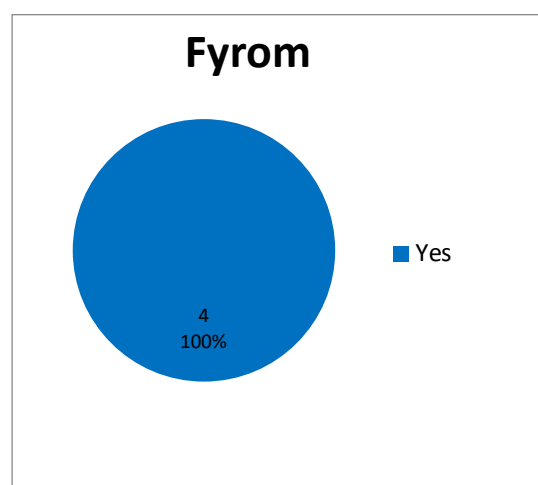
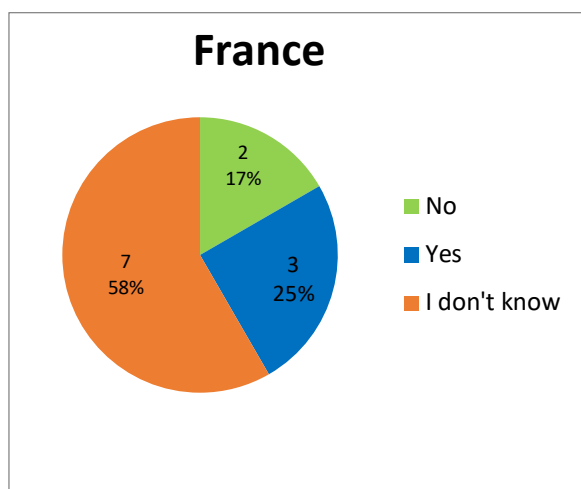
Real answer distribution:



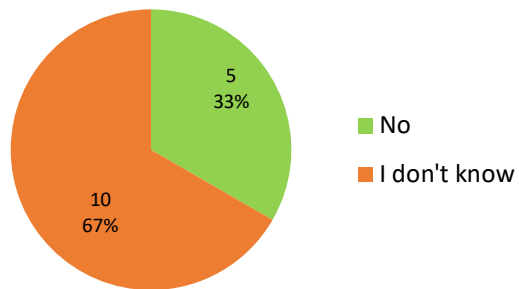
Here can be better appreciated the great majority of respondents don't know if specific regulations exist in their country.



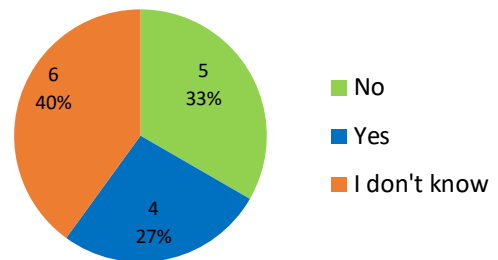
6) How specific regulations are known in each country (data analysis from answer n° 20).



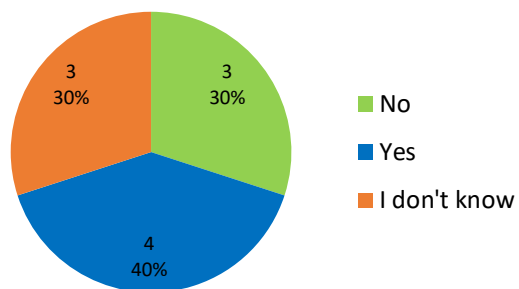
Portugal



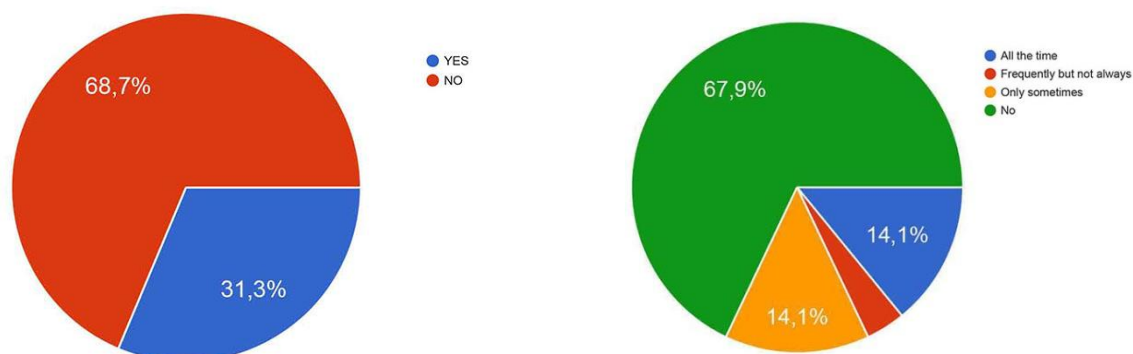
Spain



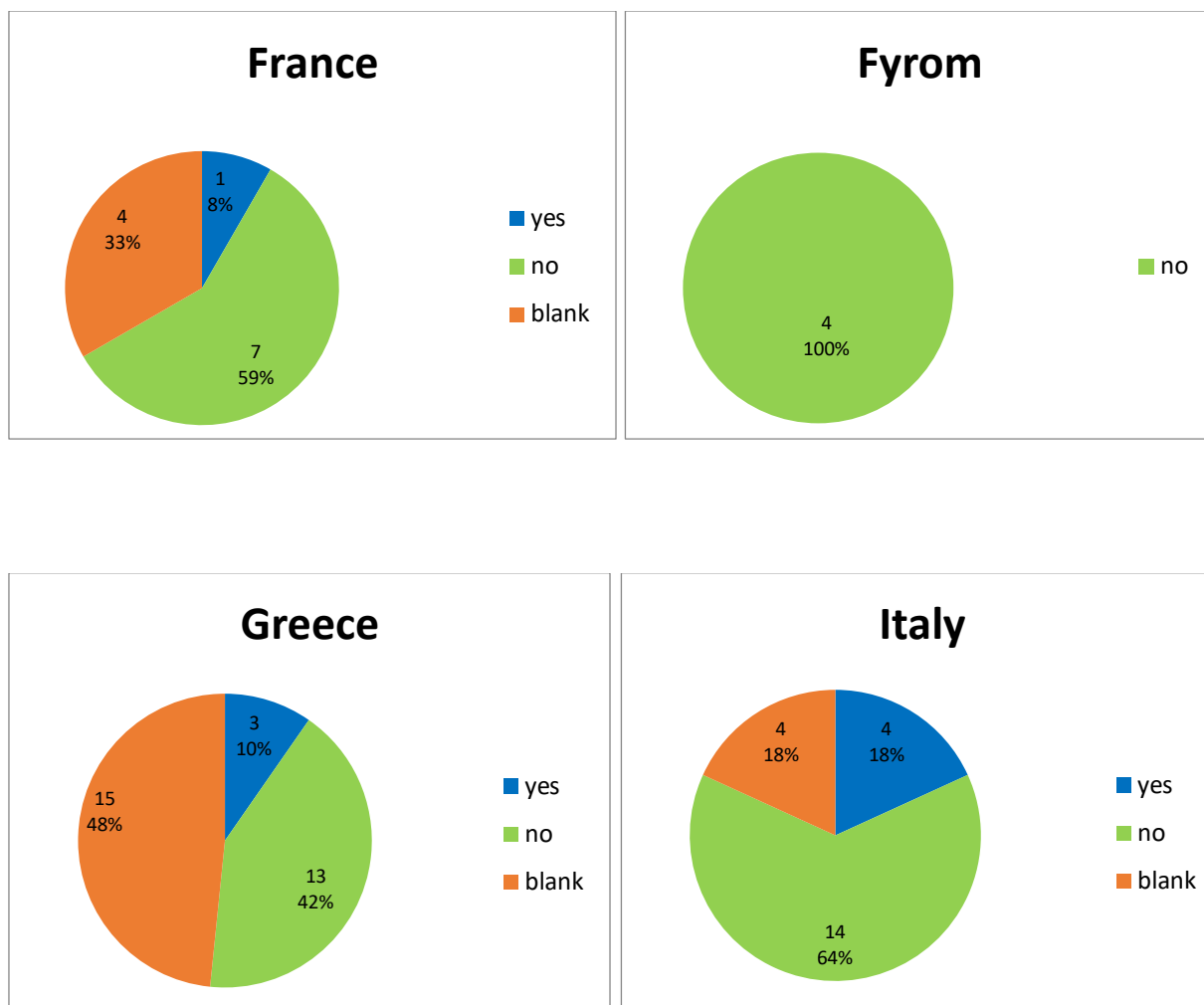
Turkey

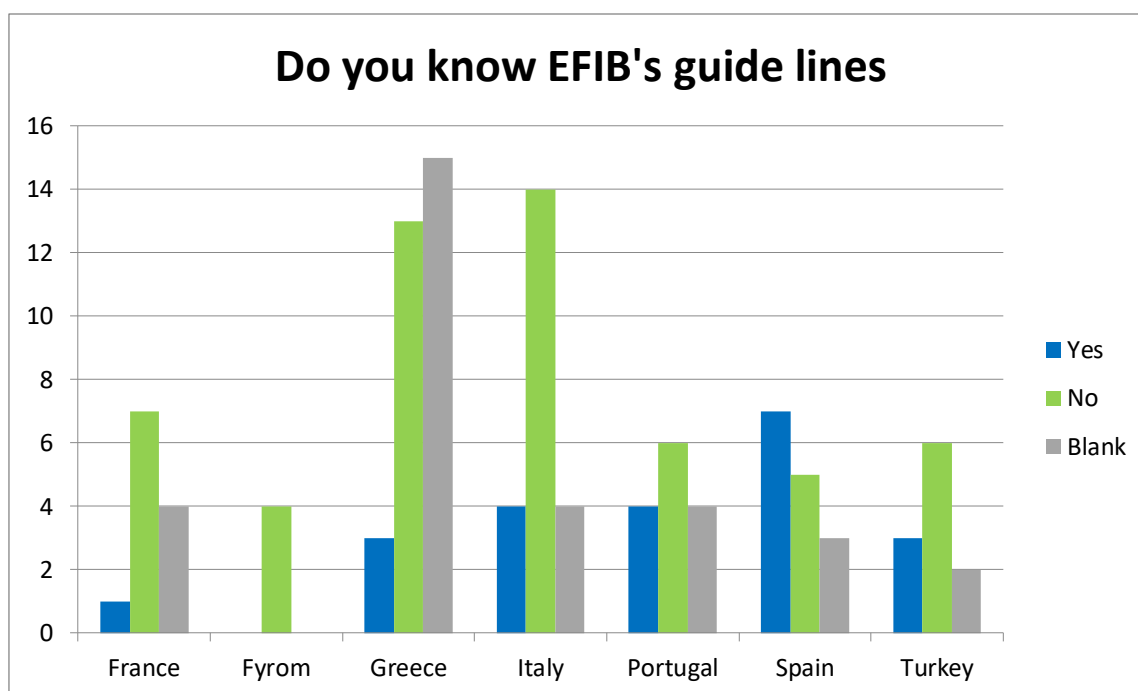
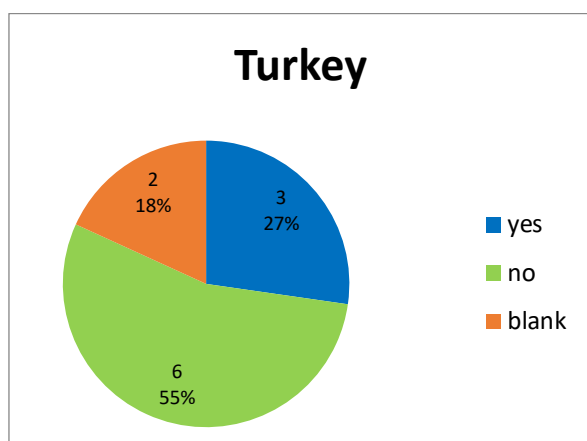
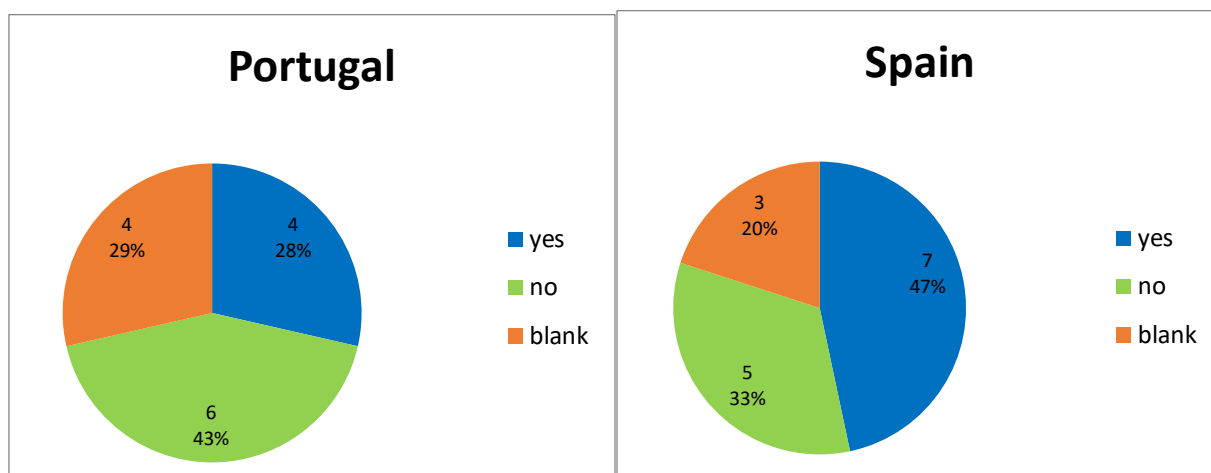


7) Mostly of the respondents don't know EFIB ... and they don't use it....(answers 22-23).

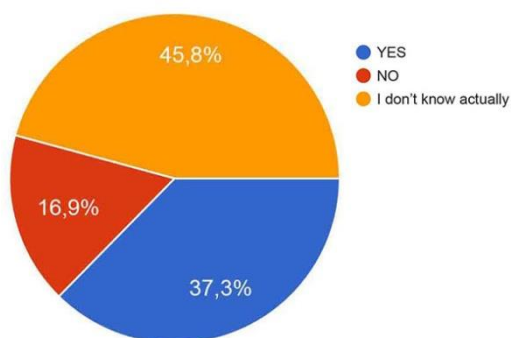


8) How specific EFIB guidelines are known in each country (data analysis from answer n° 22).



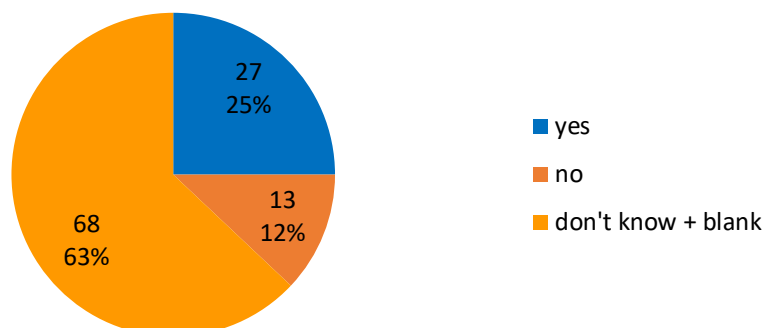


9) The 45,8% doesn't know about training courses in his country (answer n° 24).

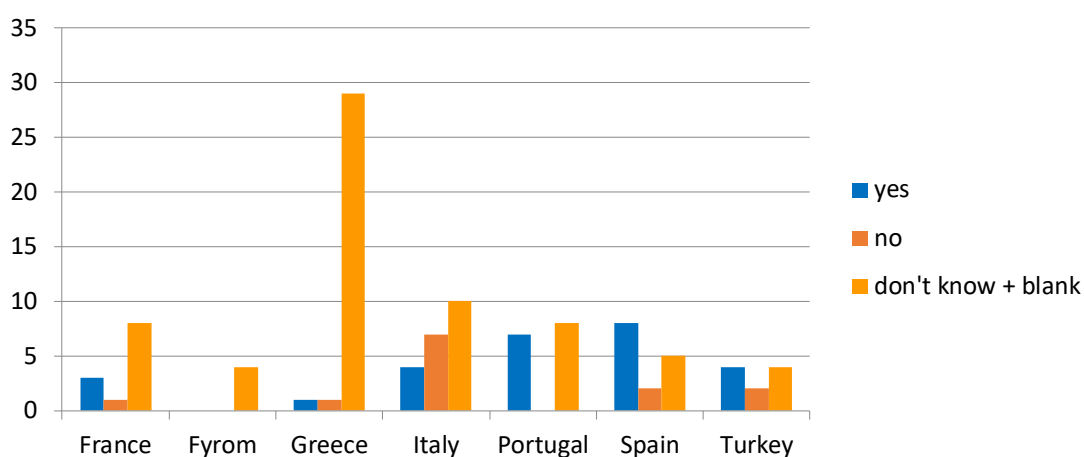


But there are many "blank answers", and the real situation is the following:

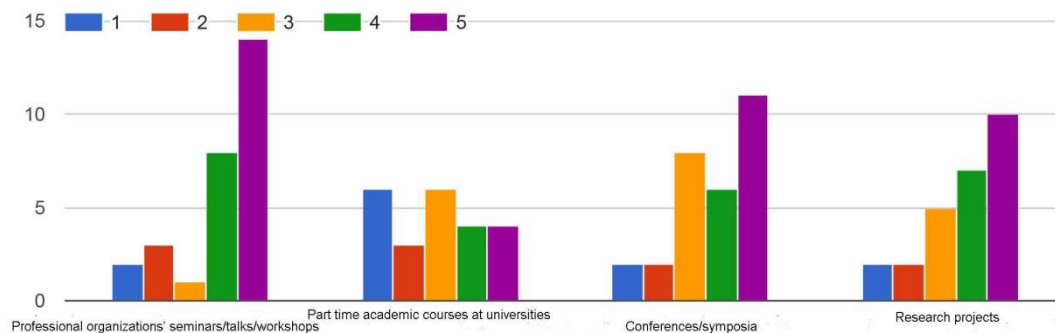
Do specific training courses exist in your country?



Do specific training courses exist in your country?



10) Most of the courses are held by the professional organizations (answer n° 28).

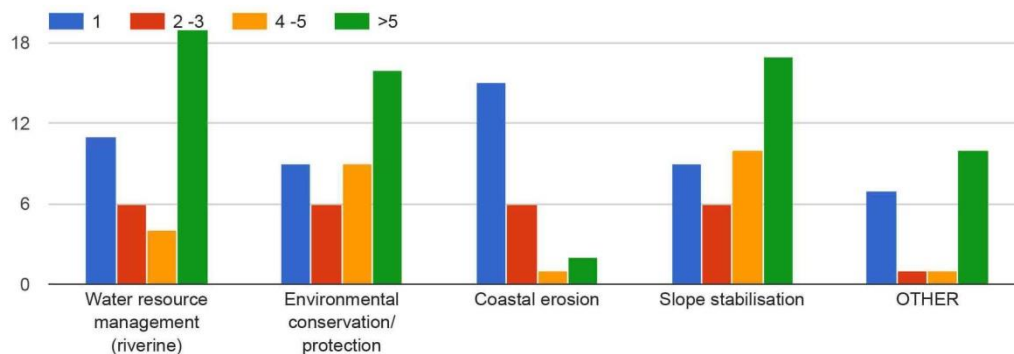


5.2.2 Remarks on the Construction stage:

There were totally 49 answers to this stage.

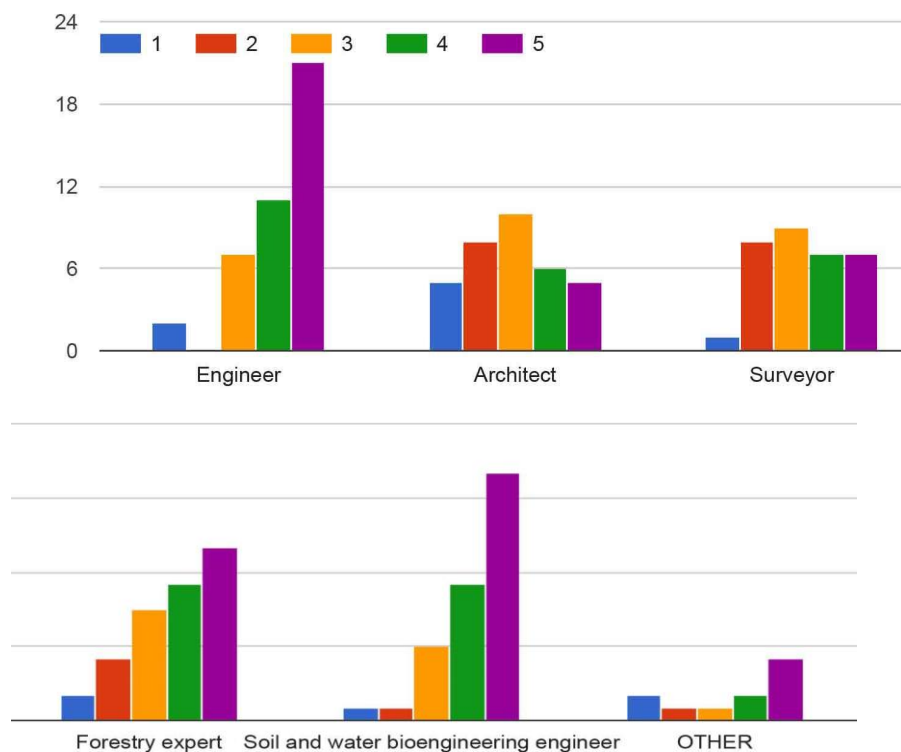
1) Most of the respondent persons are working on (answer n°1):

- Water resources.
- Habitat and soil protection.
- Slope stabilisation.

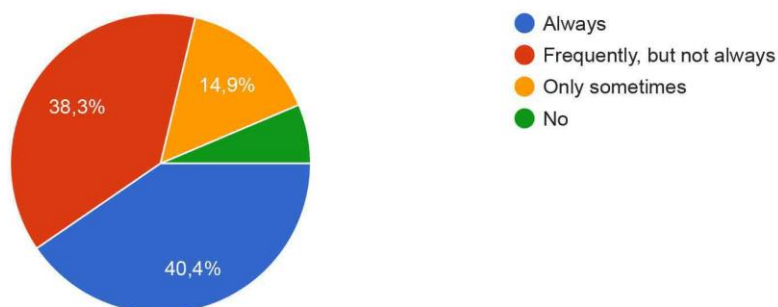


2) The most important professional roles involved in the construction stage are (answer n° 6):

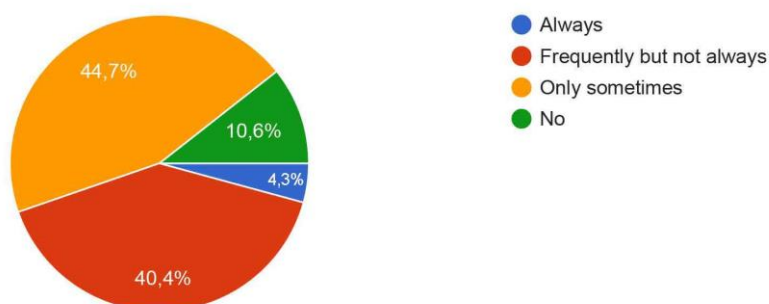
- Engineers.
- Forestry experts.



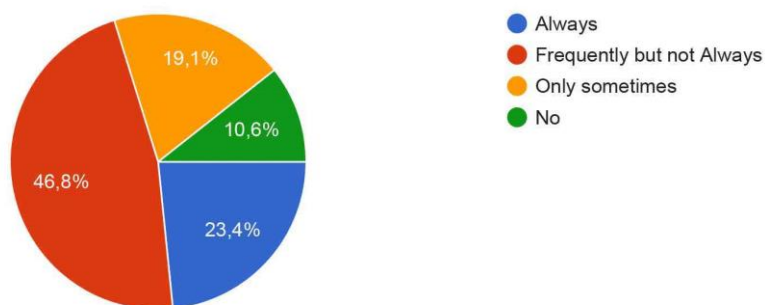
3) Usually, before the construction there was a design stage (answer n° 5).



4) The workforce is not sufficiently qualified... (answer n° 13).

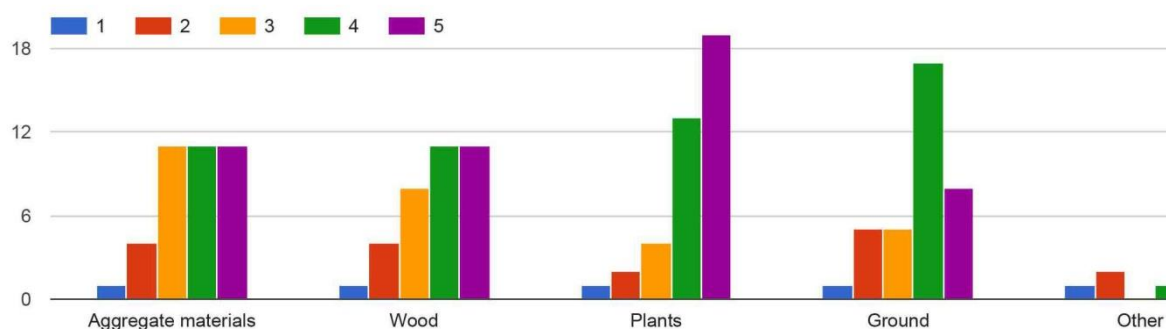


5) The quality of the materials was controlled during the works. (answer 10).

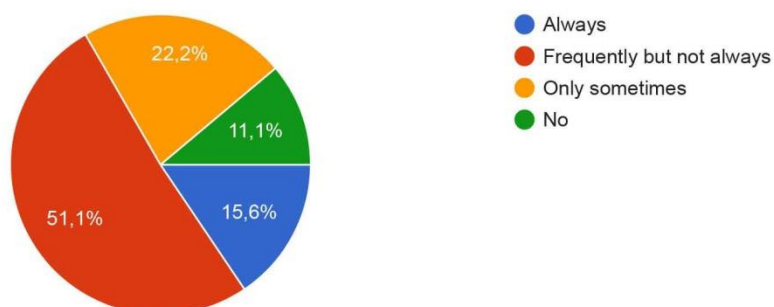


6) Mostly were controlled (answer n° 11):

- Plants.
- Wood.
- Aggregate materials.
- Ground.

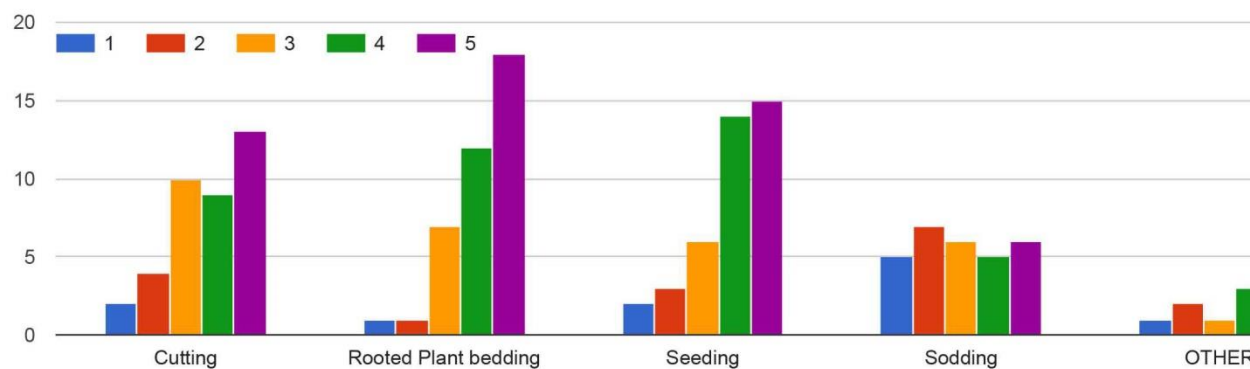


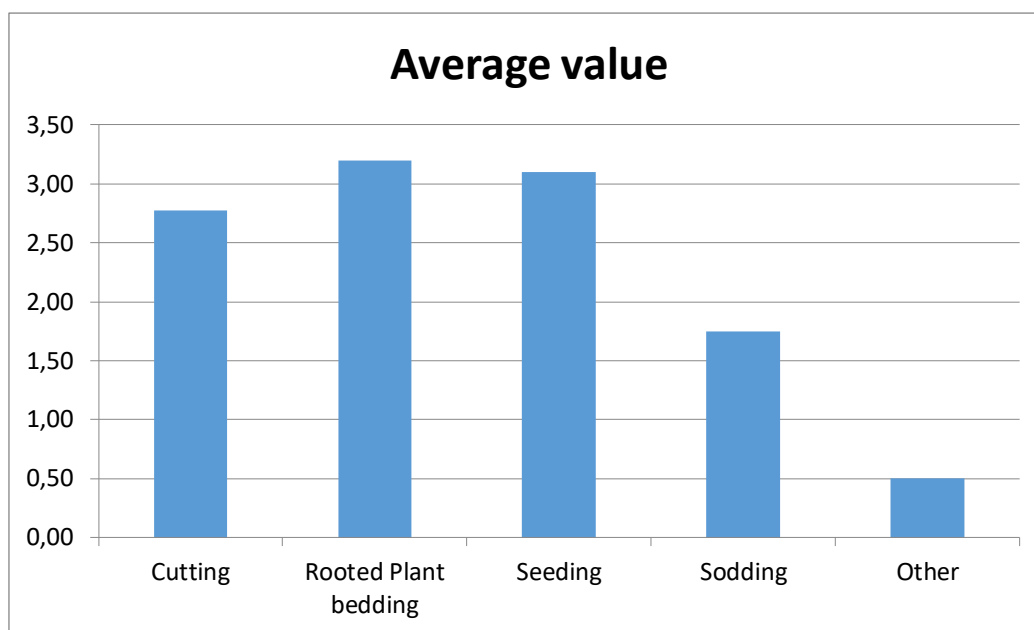
7) The planting takes a significant amount of the total construction time, (answer n° 14).



8) The most used planting techniques are (answer n° 15):

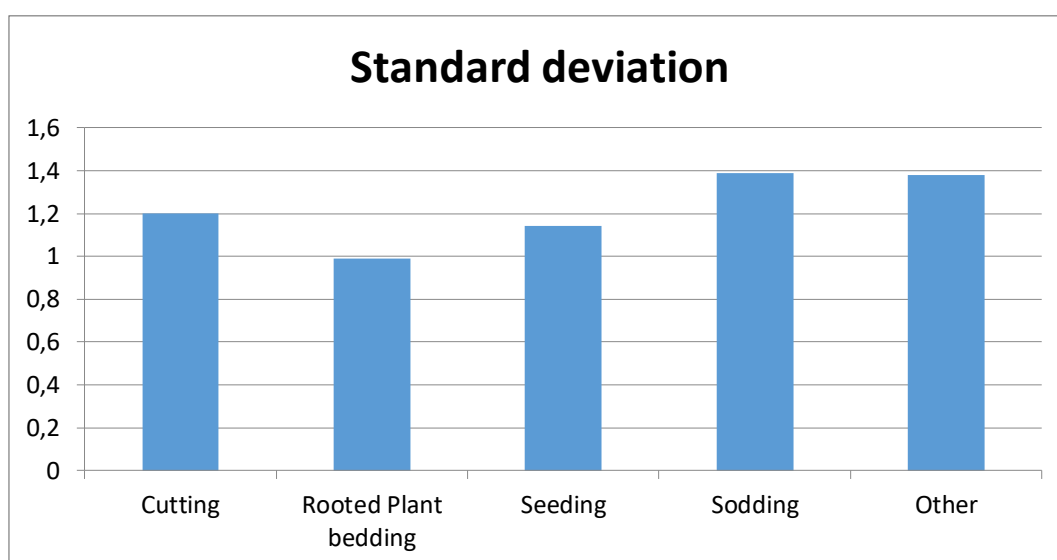
- Cutting.
- Rooted plant bedding.
- Seeding.





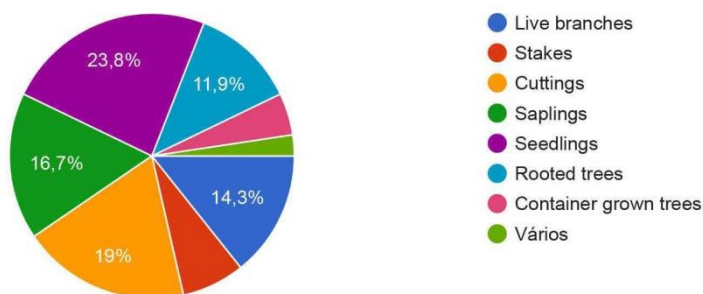
The other methods are:

- Hydroseeding;
- manual gathering;
- large tree transplantation;
- container and pot planting;
- talea;
- brush mattresses;
- cribwalls.

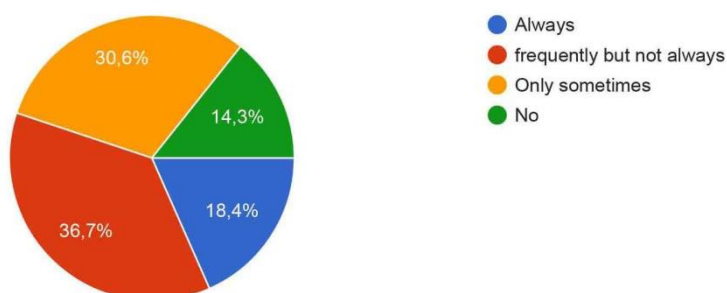


9) The most used living materials are: (answer n° 17):

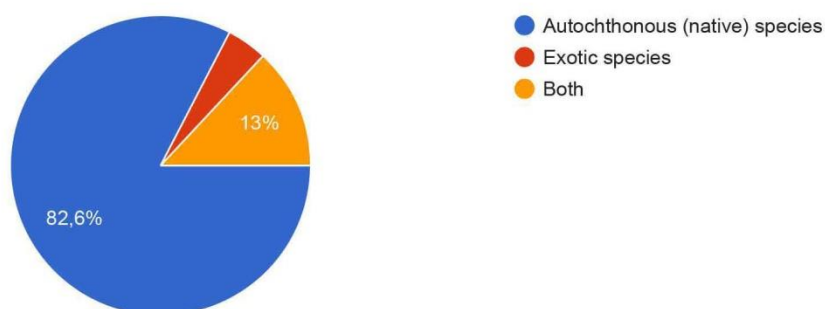
- Seeding.
- Cutting.
- Saplings.
- Live branches.



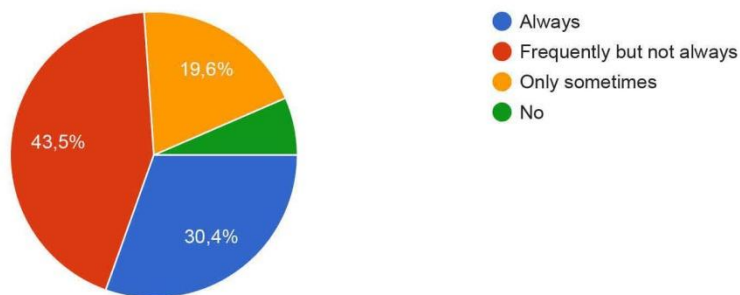
10) It was not easy to obtain the specified plants (answer n° 19).



11) Most of the the live species were autochthonous (answer n° 20).



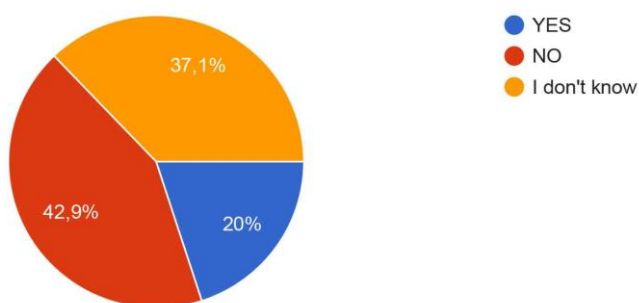
12) Most of the live species were collected in nearby areas (answers n° 21).



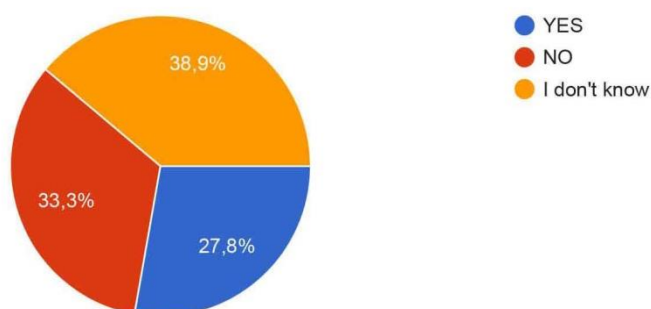
5.2.3 Remarks on the Monitoring stage:

There were totally 39 answers to this stage.

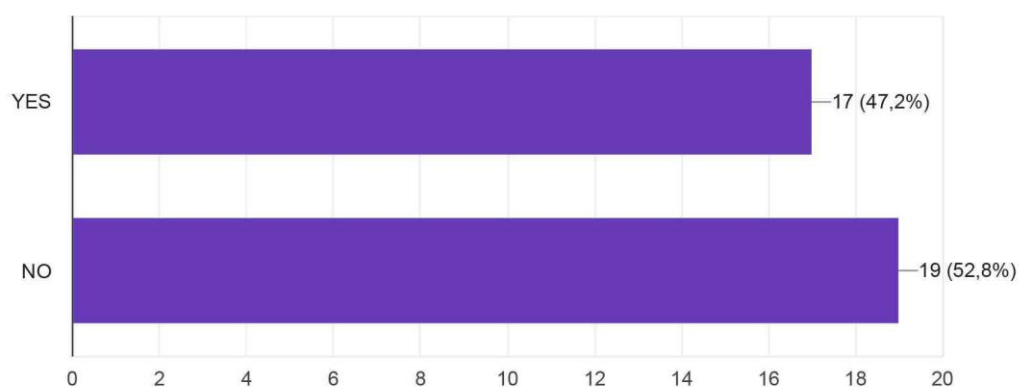
1) The 37,1 % of the respondents don't know if any specific monitoring regulation exists in his country (answer n° 3).



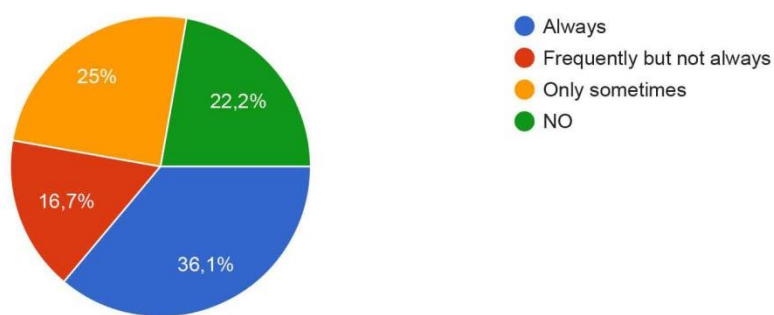
2) The 38,9 % of the respondents don't know if any specific technical rule on maintenance exists in his country (answer n° 17).



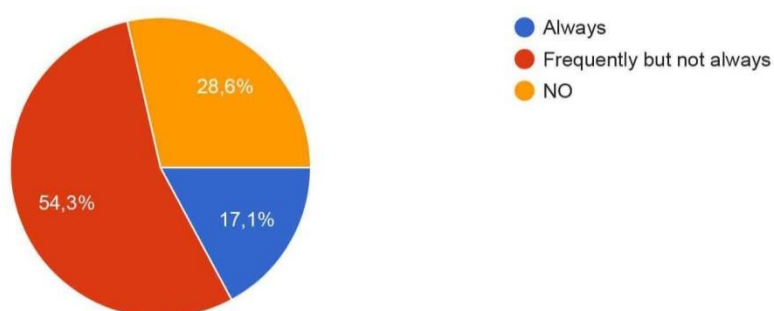
3) The 52,8% of the respondent people don't know the EFIB and its monitoring recommendations (answer n° 5).



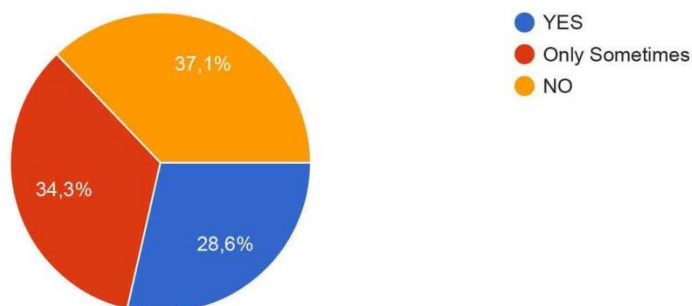
4) Only the 36,1% of the respondents always considered in his projects a specific budget for the monitoring stage (answer n° 7).



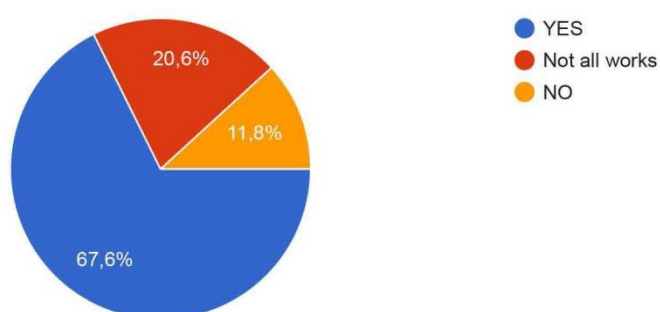
5) The 82.9% of respondents declare that the monitoring process is not or not always clearly detailed.(answer n° 8).



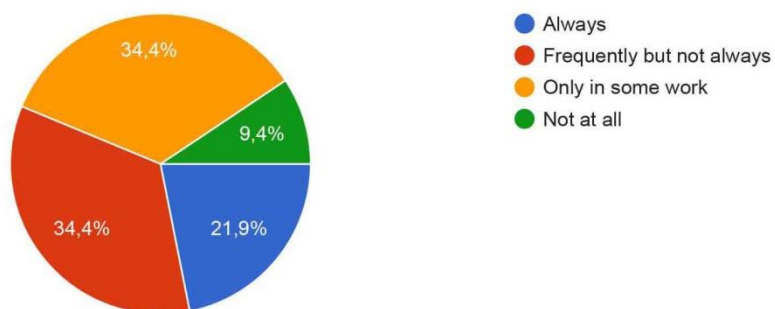
6) Often the monitoring stage was an opportunity to reflect on some planning decisions (answer n° 12).



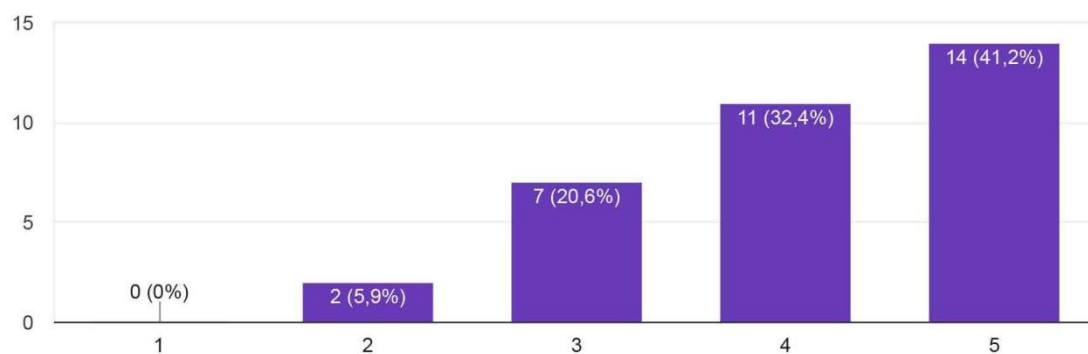
7) A planned maintenance is felt very useful for the soil and water bioengineering works (answer n° 19).



8) Often there is a gap between what was planned and the real growth of the plants (answer n° 20).

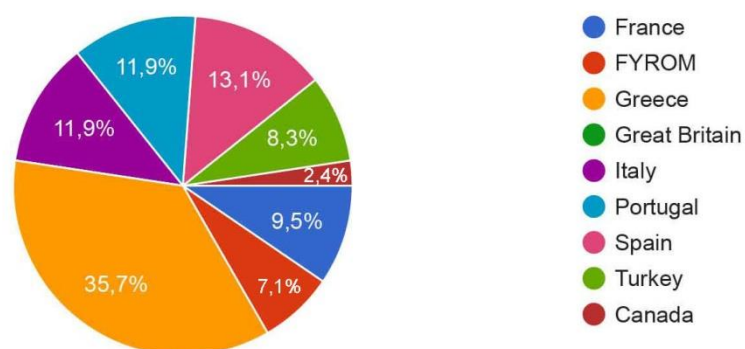


9) The maintenance is felt very important for the overall success of the intervention (answer n° 25).

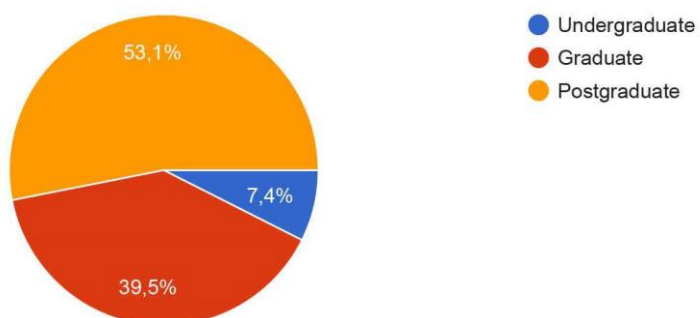


5.2.4 Remarks on the Training stage:

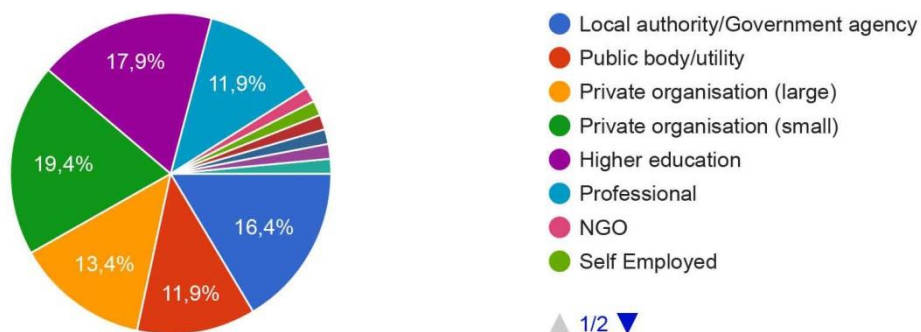
1) There were totally 84 answers from this stage:



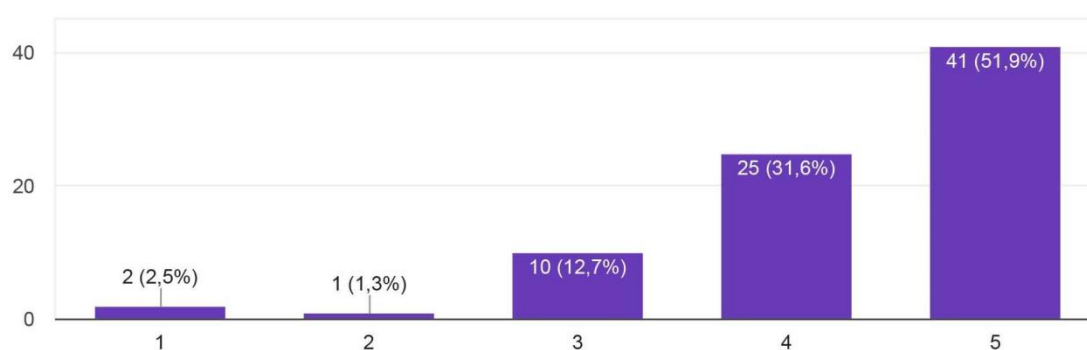
2) Among all these, 23 were from students. The 39,5% are graduate and the 53,1% are post graduate (answer 3).



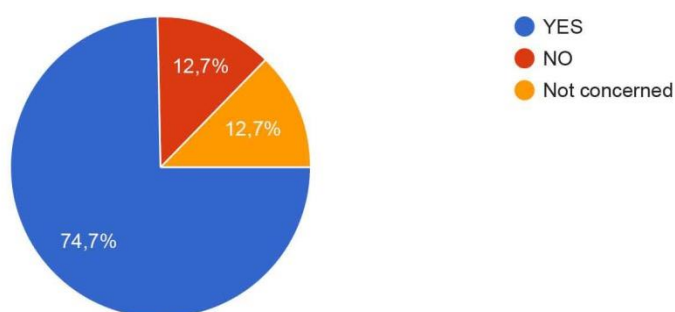
3) The other respondents' employ (answer 11).



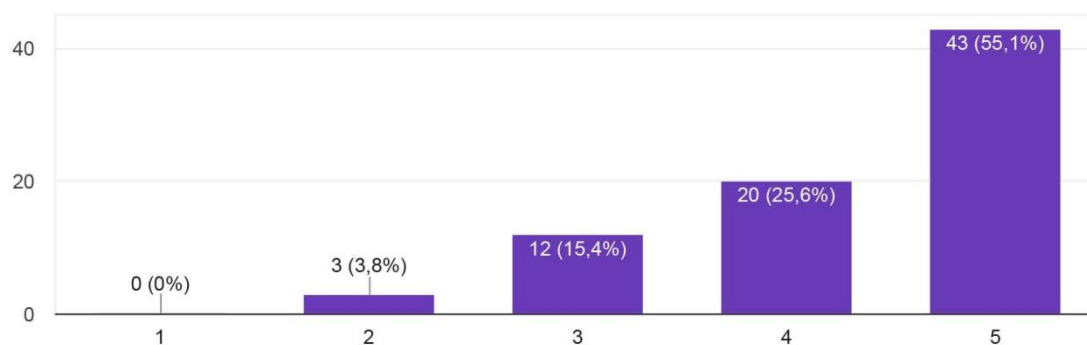
4) Most of respondents think that a training course in soil and water bioengineering should be very useful (answer n° 13).



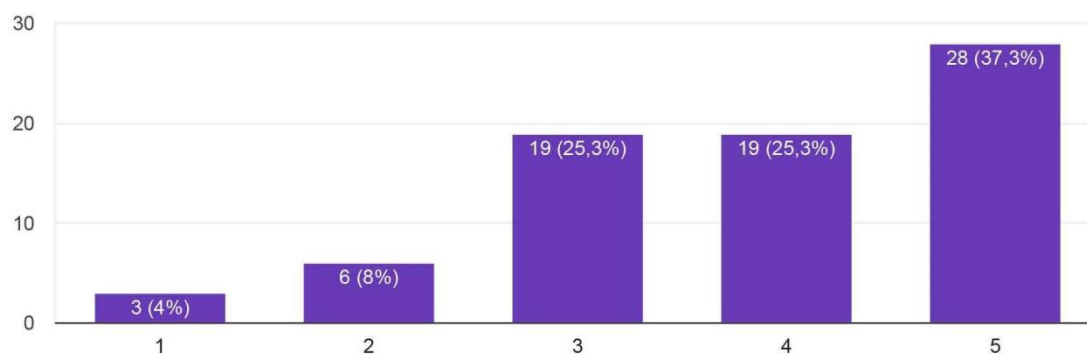
5) The 74,7% would attend to it (answer n° 14).



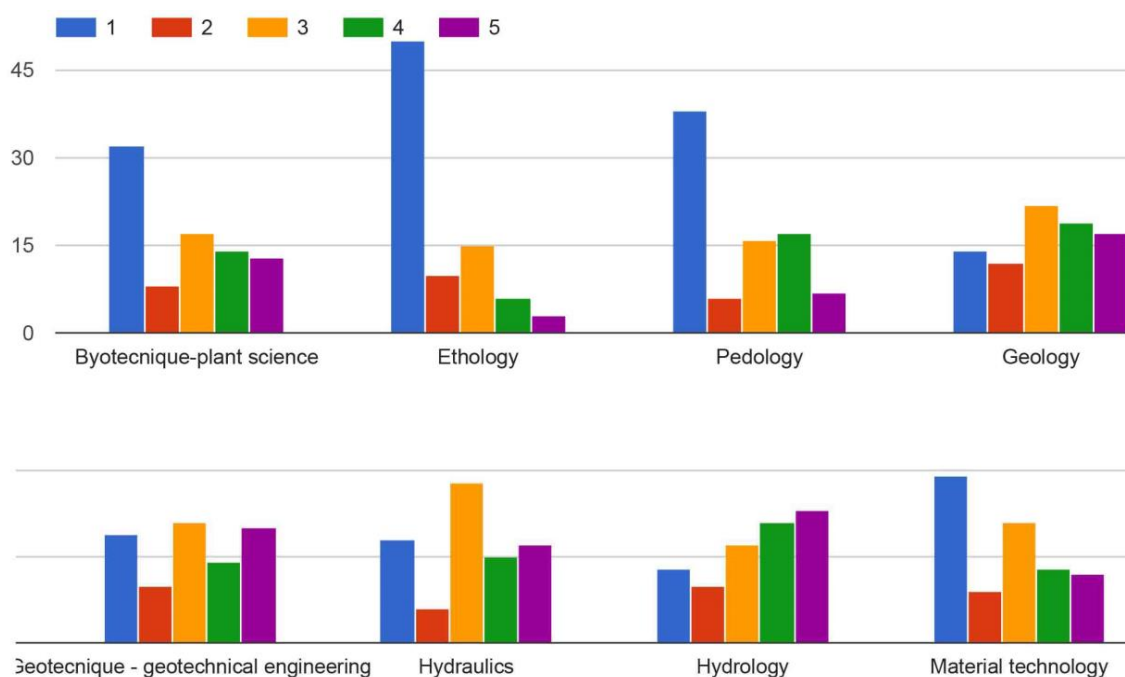
6) Most of respondents think that a master level degree in soil and water bioengineering should be very useful (answer n° 15).

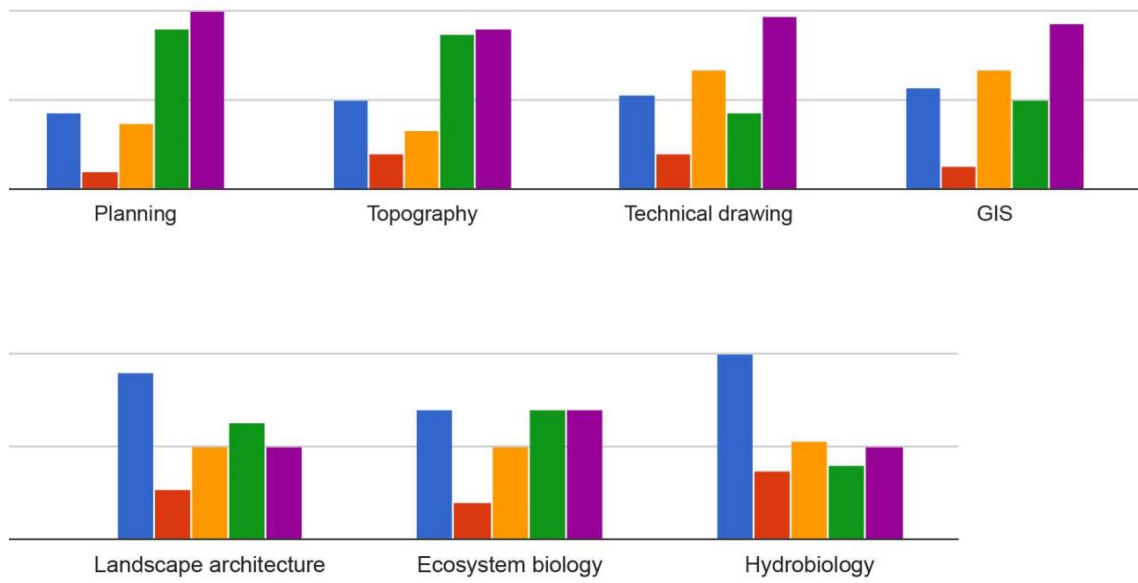


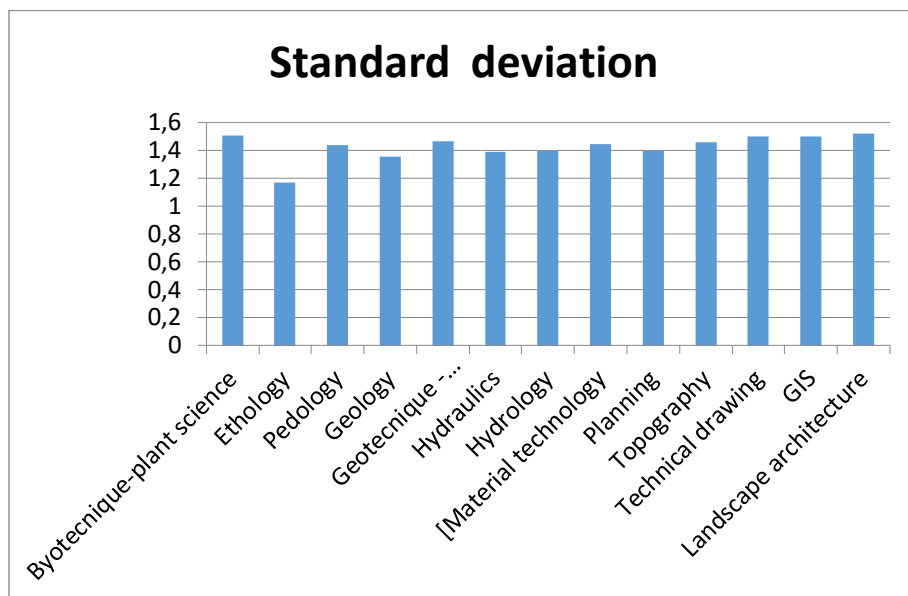
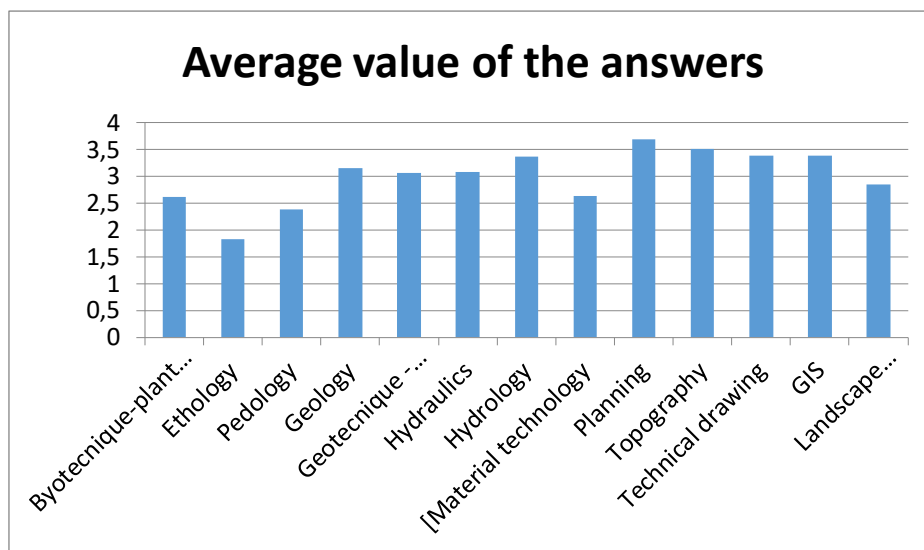
7) Most of respondents think that a training course or a master level degree should be very useful to enhance their employability (answer n° 18).



8)

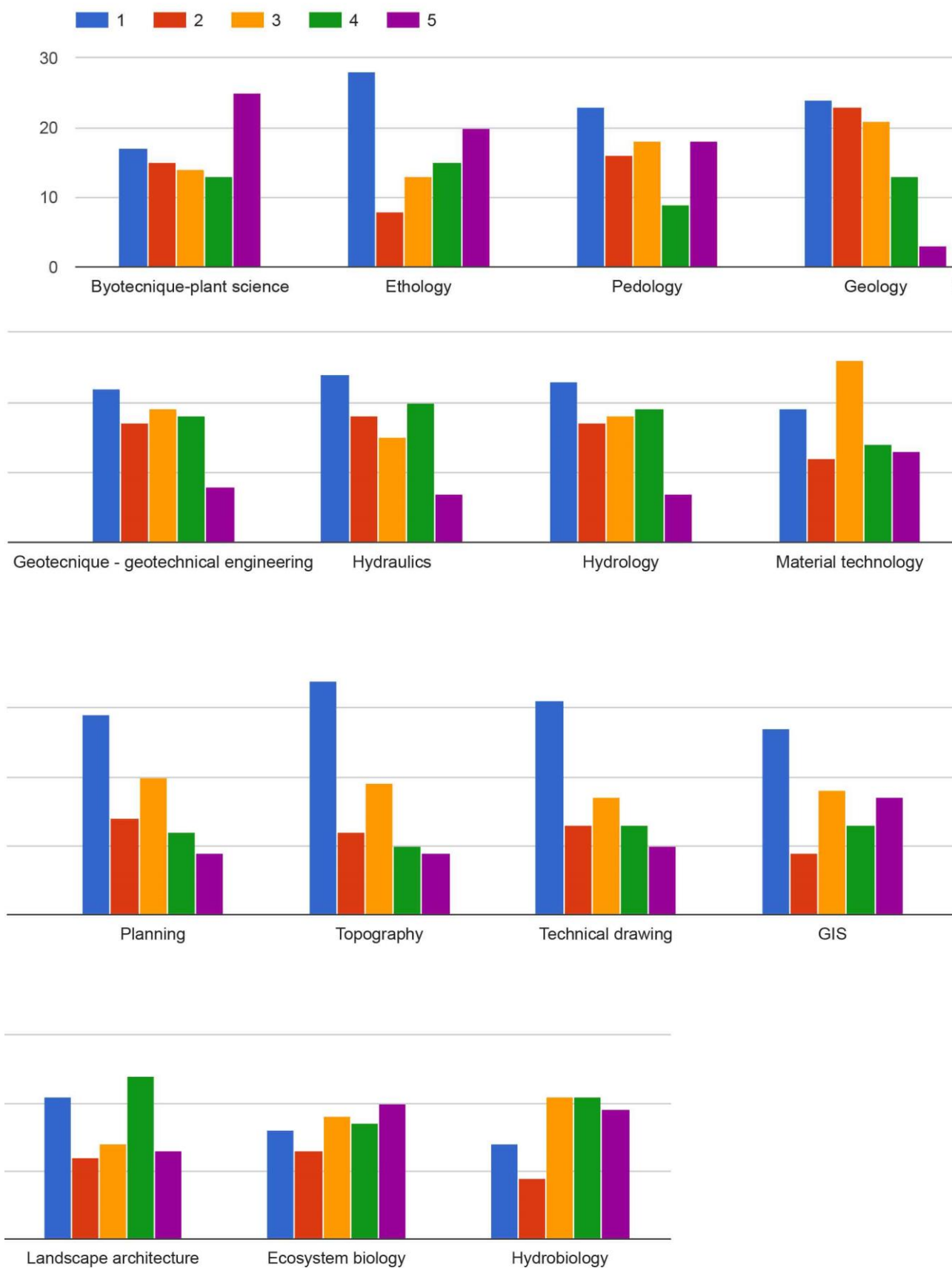


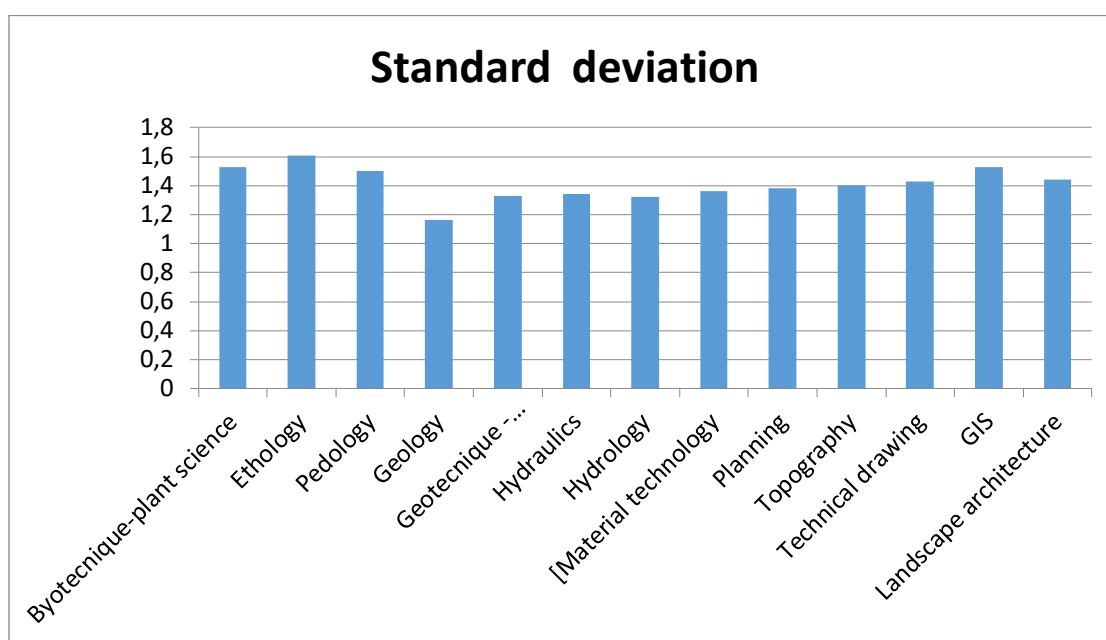
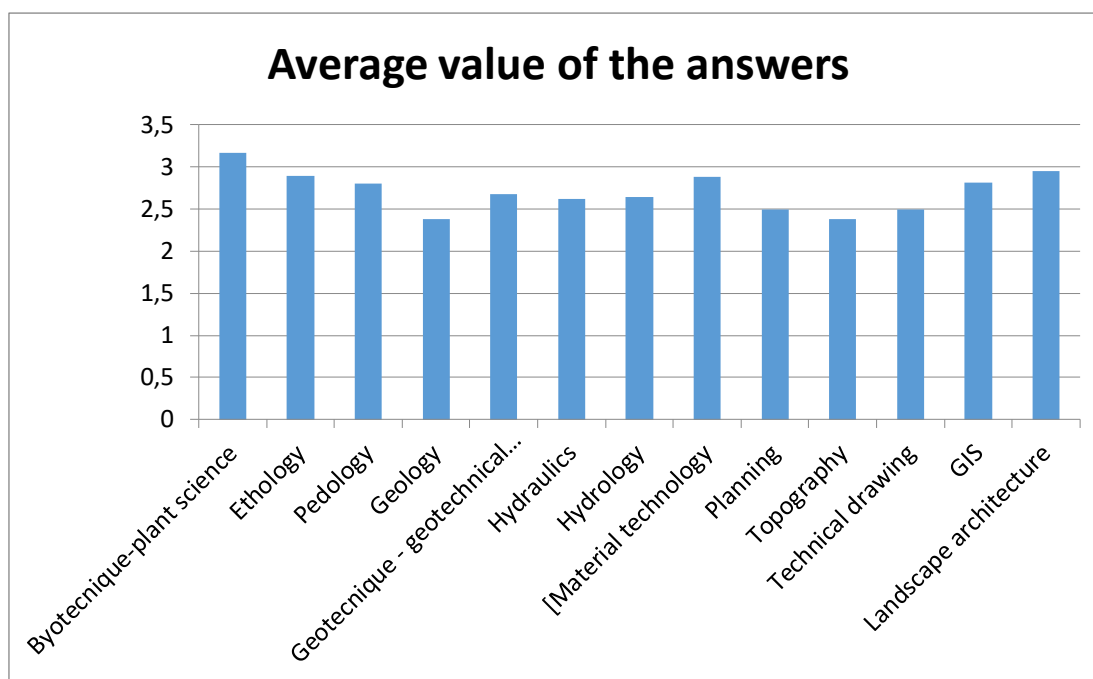




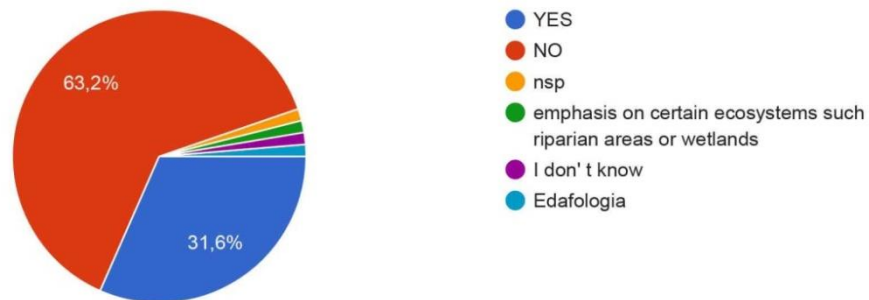
9) Among the technical subjects they had lack in.(answer n° 21):

- Biotechnique, Ethology.
- Pedology.

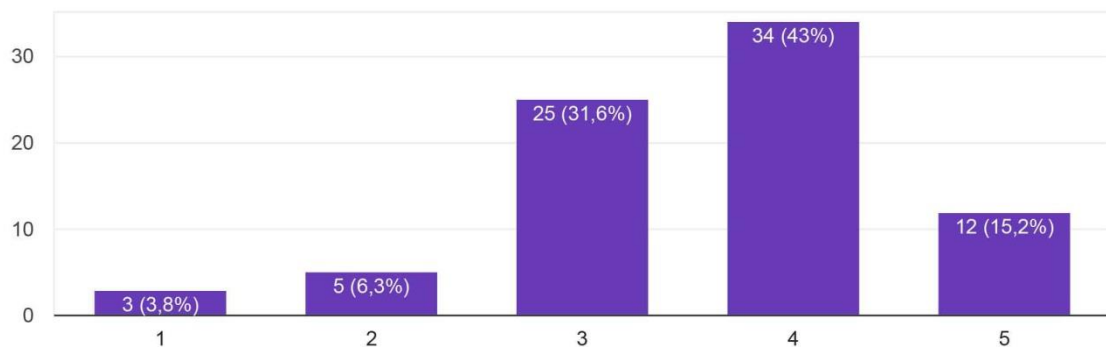




10) Most of the respondents think the subjects they studied were sufficient to allow them to face soil and water bioengineering works (answer n° 22).



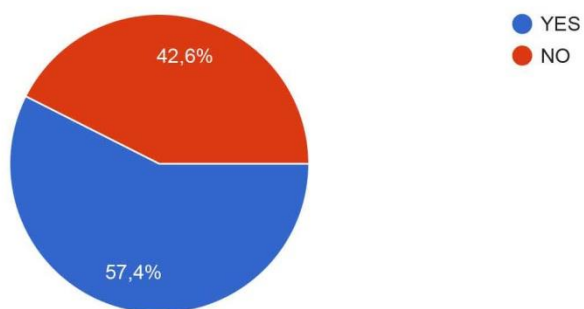
11) Most of the respondents think there is a shortage of professional trained in the subject of soil and water bioengineering in Europe (answer n° 24).



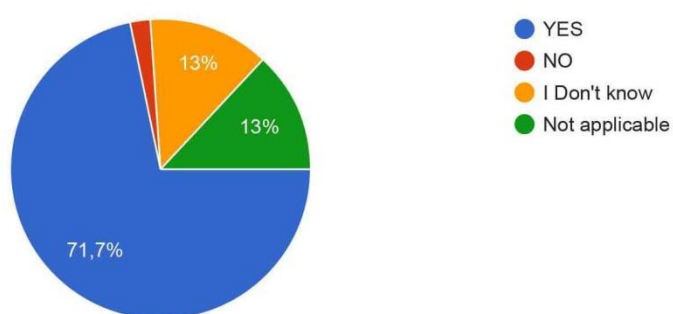
5.2.5 Remarks on the Company/Enterprises stage:

There were totally 47 answers to this stage.

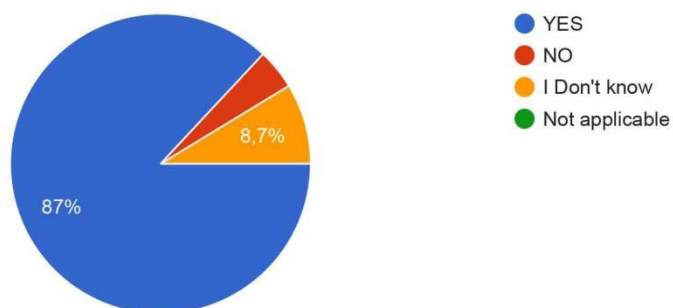
1) The 42,6% of the respondents haven't previously worked in the soil and water bioengineering sector (answer n°1).



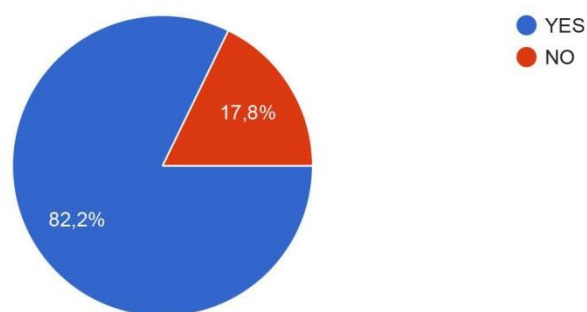
2) Most of the respondents think this sector could expand their business (answer n° 2).



3) Most of the respondents say there has been an increase of this sector in the last years (answer n° 3).

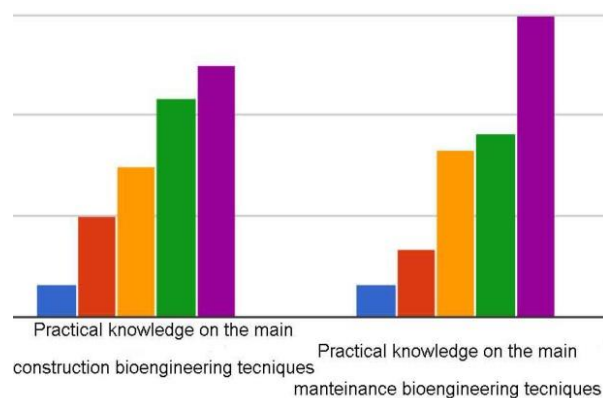
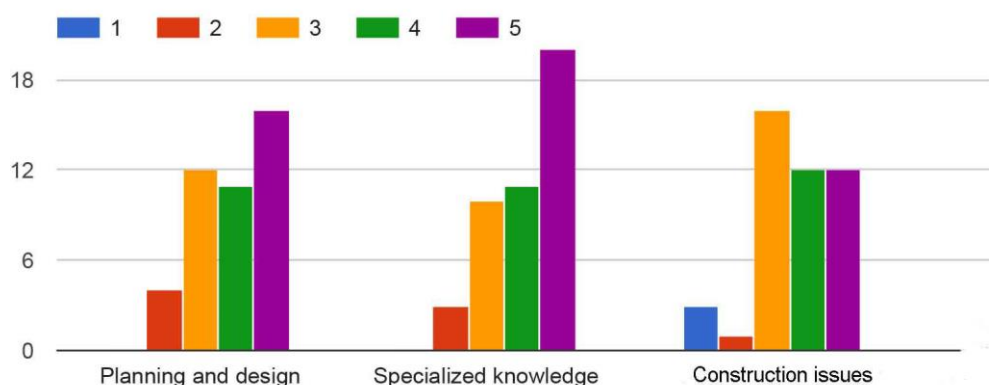


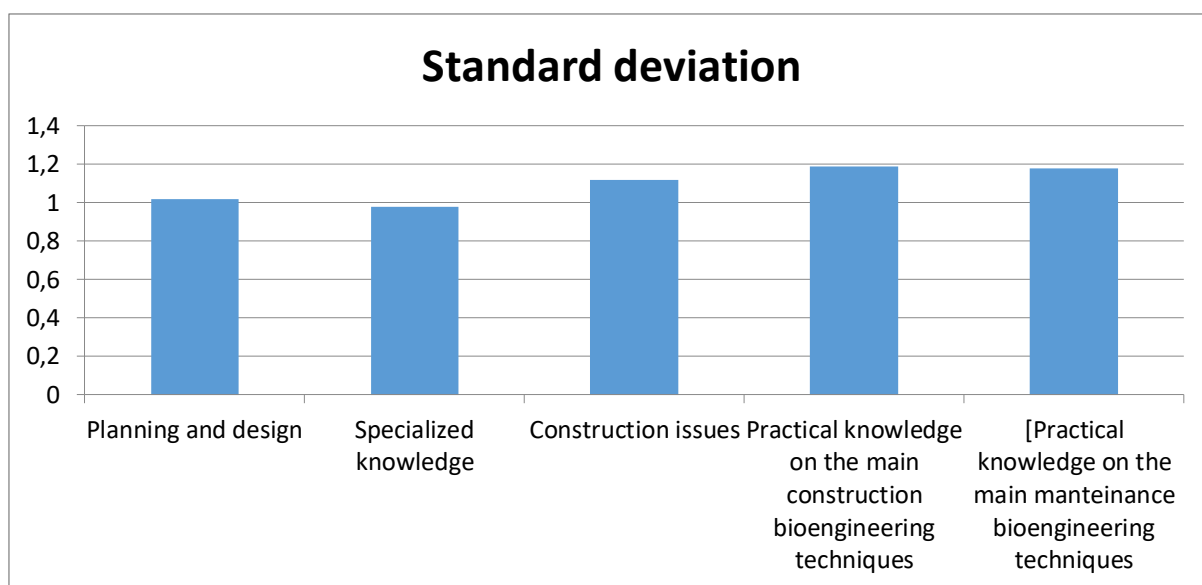
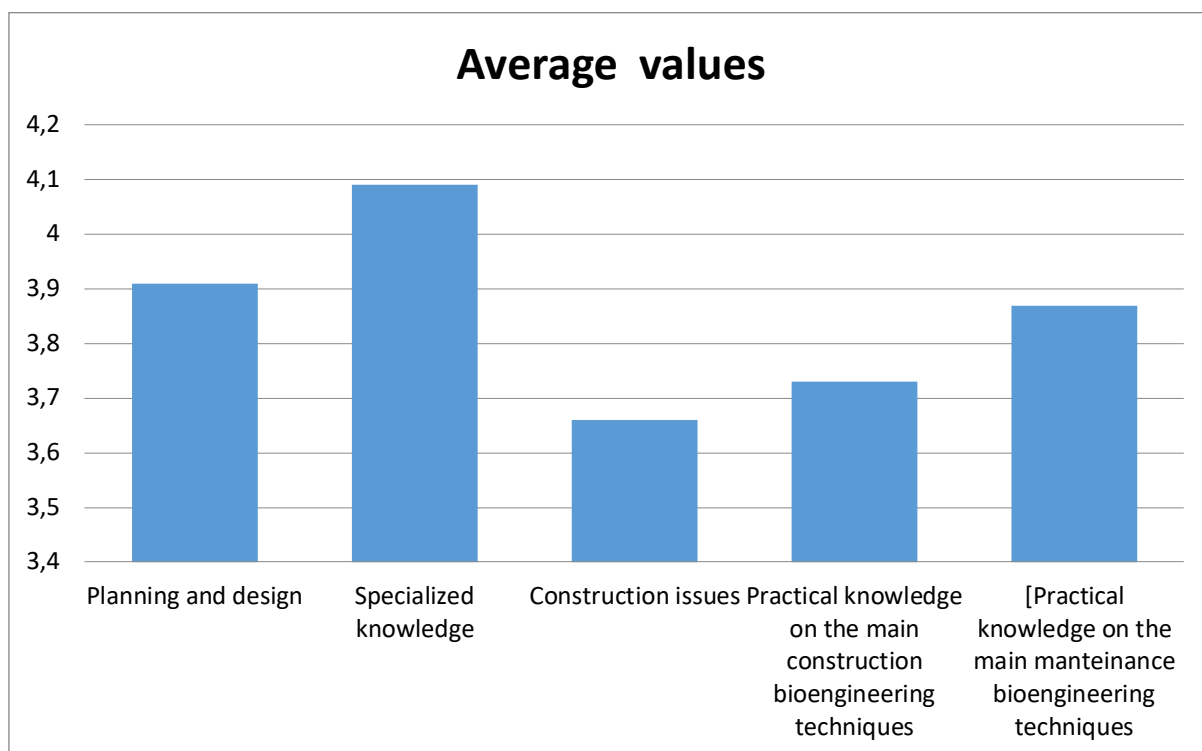
4) Most of the respondents are aware they need a specific training in this sector (answer n° 4).



5) The areas of training in the Planning and project skills development they feel lacking are mostly (answer n° 5):

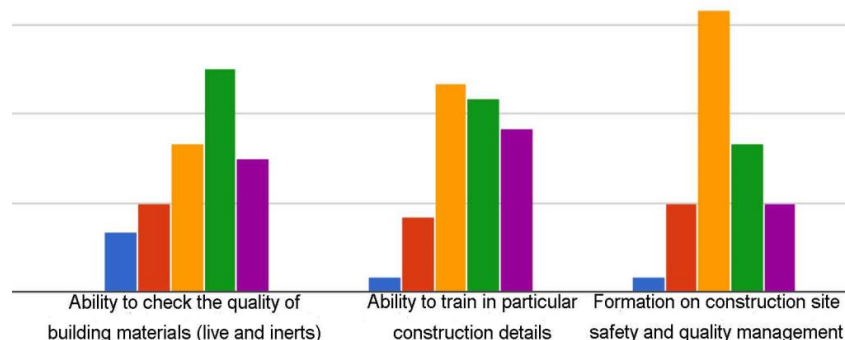
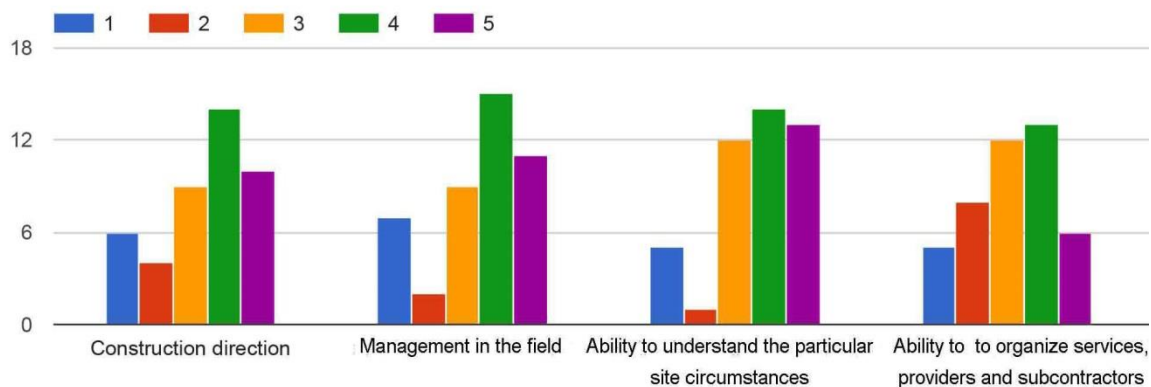
- Specialized knowledge.
- Planning and design.
- Practical knowledge of the main maintenance bioengineering techniques.

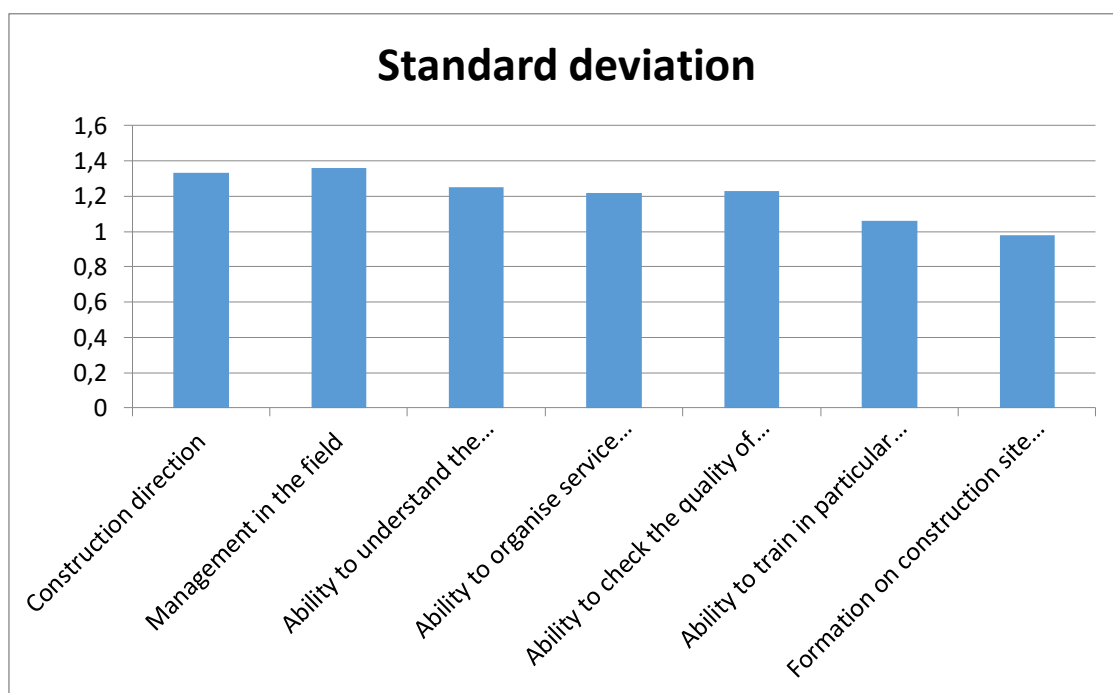
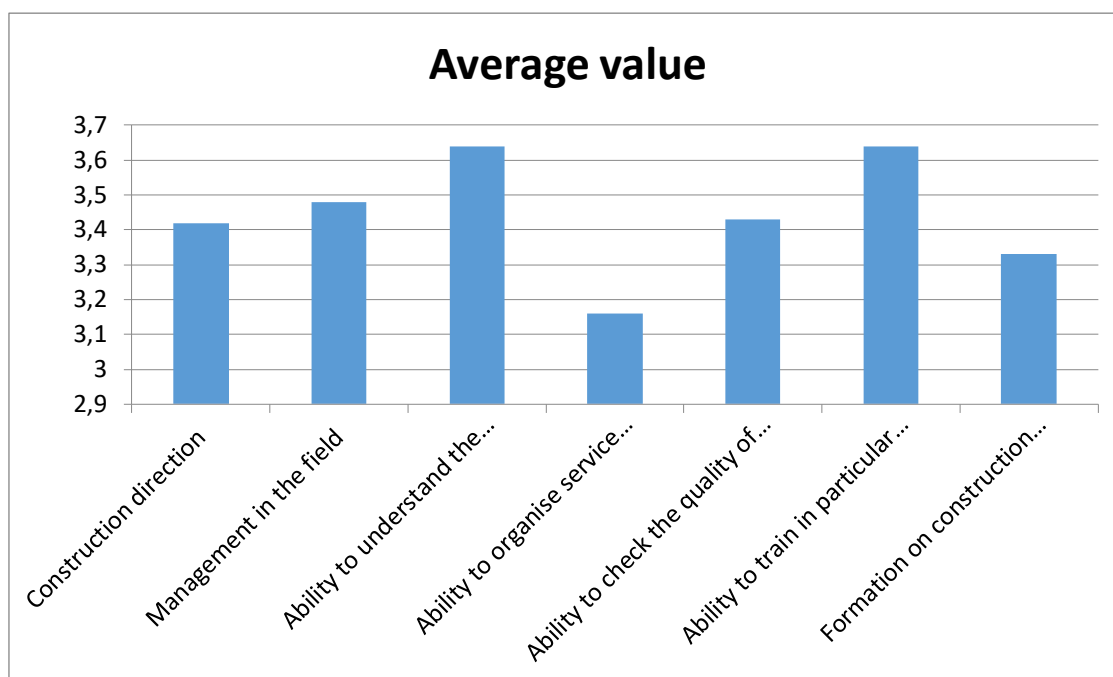




6) The areas of training in the Construction management and control they feel lacking are mostly (answer n° 7):

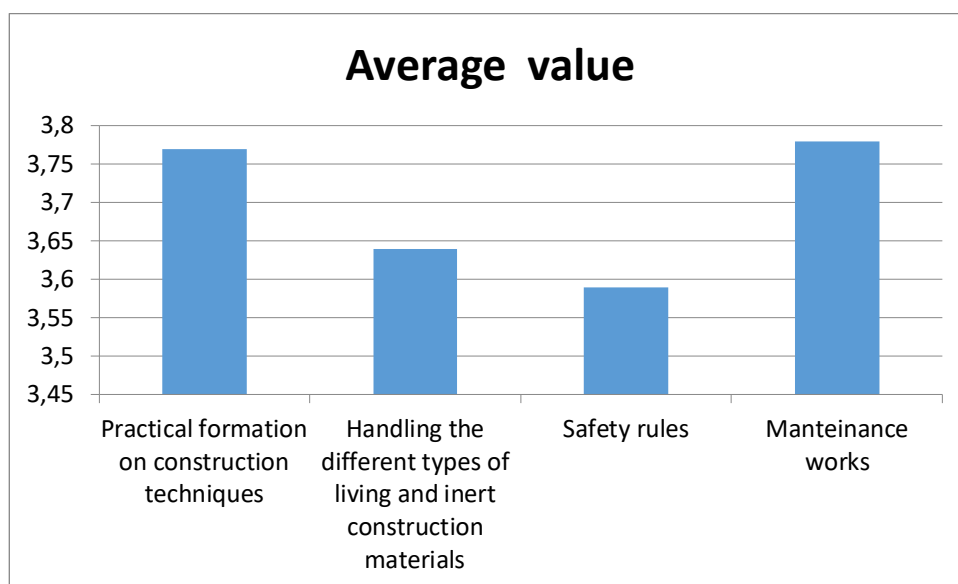
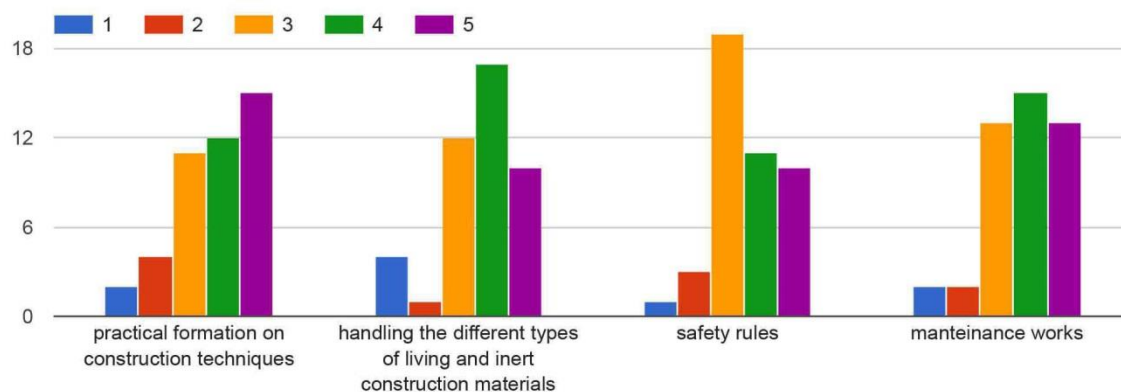
- Ability to understand the particular site circumstances.
- Ability to train in particular construction details.

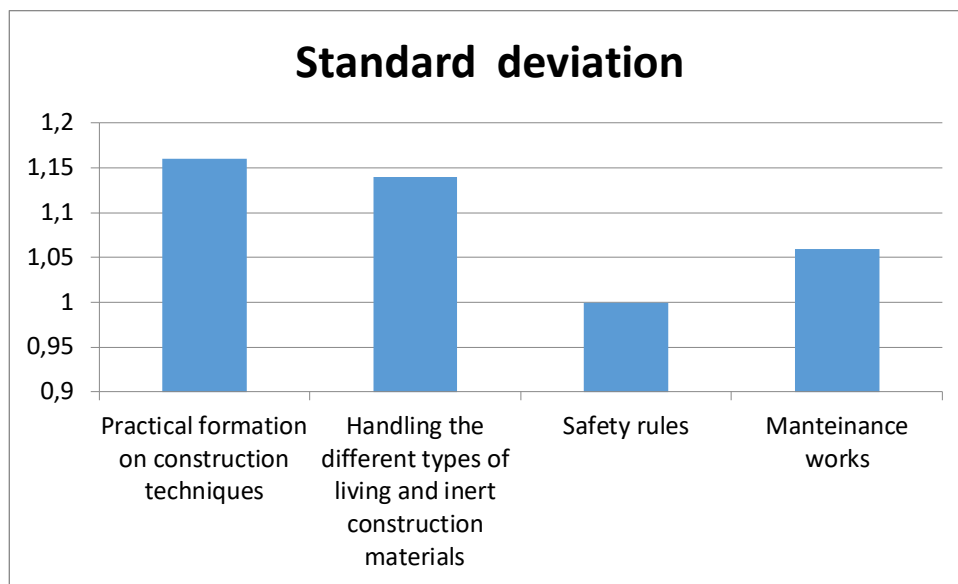




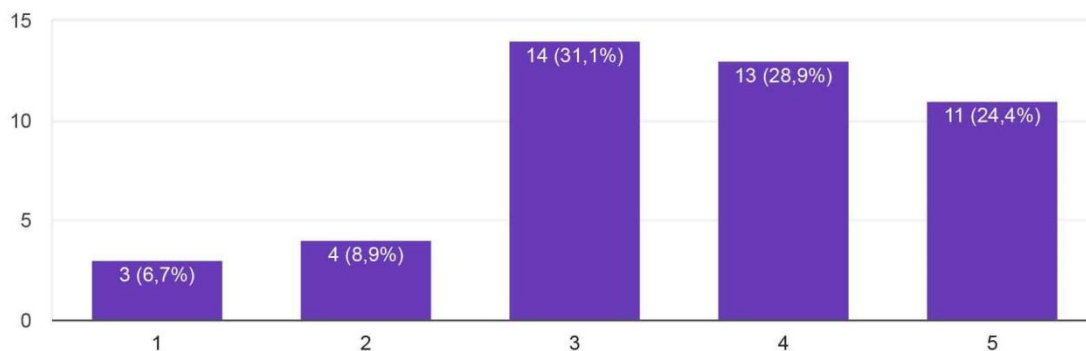
7) The areas of training in the Technical training for construction workers they feel lacking are mostly (answer n° 9):

- The practical training on construction techniques.
- Maintenance works.



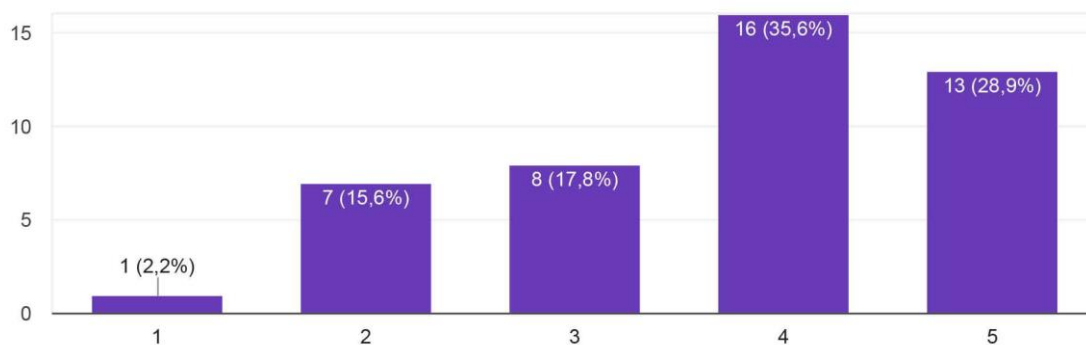


8) Most of the respondents think that the technical knowledge within their company allows them to easily deal with soil water bioengineering works (answer n° 11).



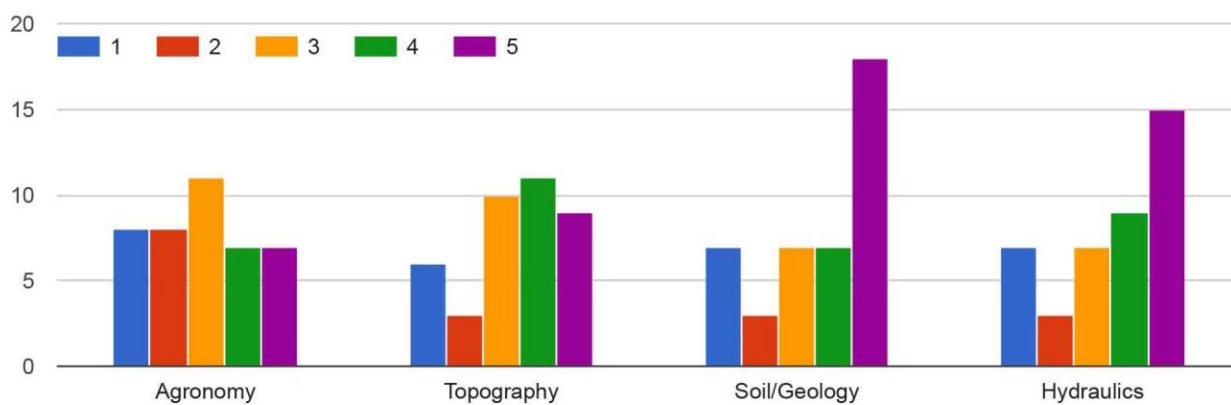
9) They mostly think that within their enterprises, the employers/colleagues need some training course on Soil and water bioengineering (answer n° 12).

Figure 12

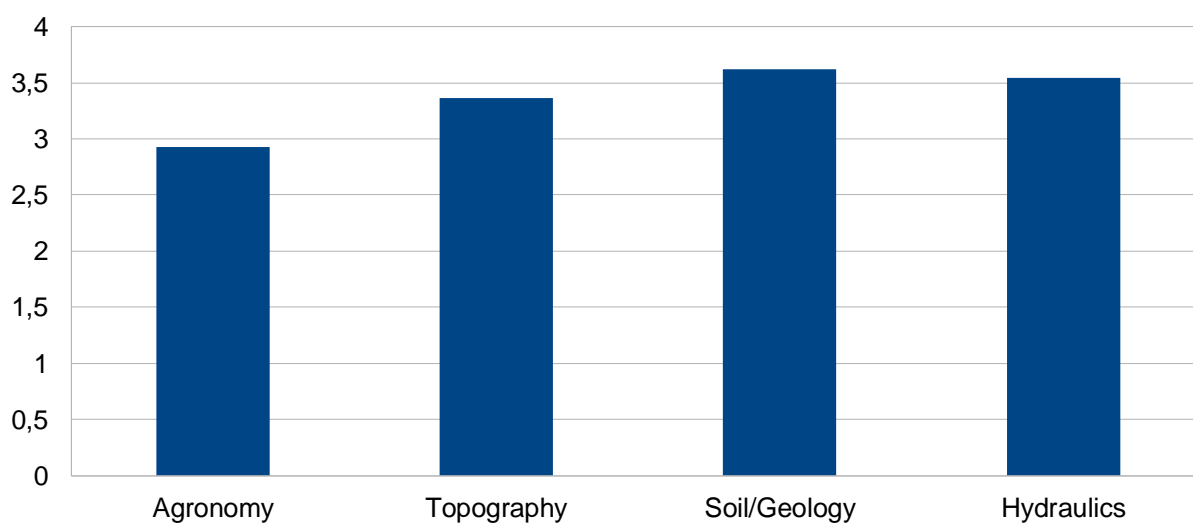


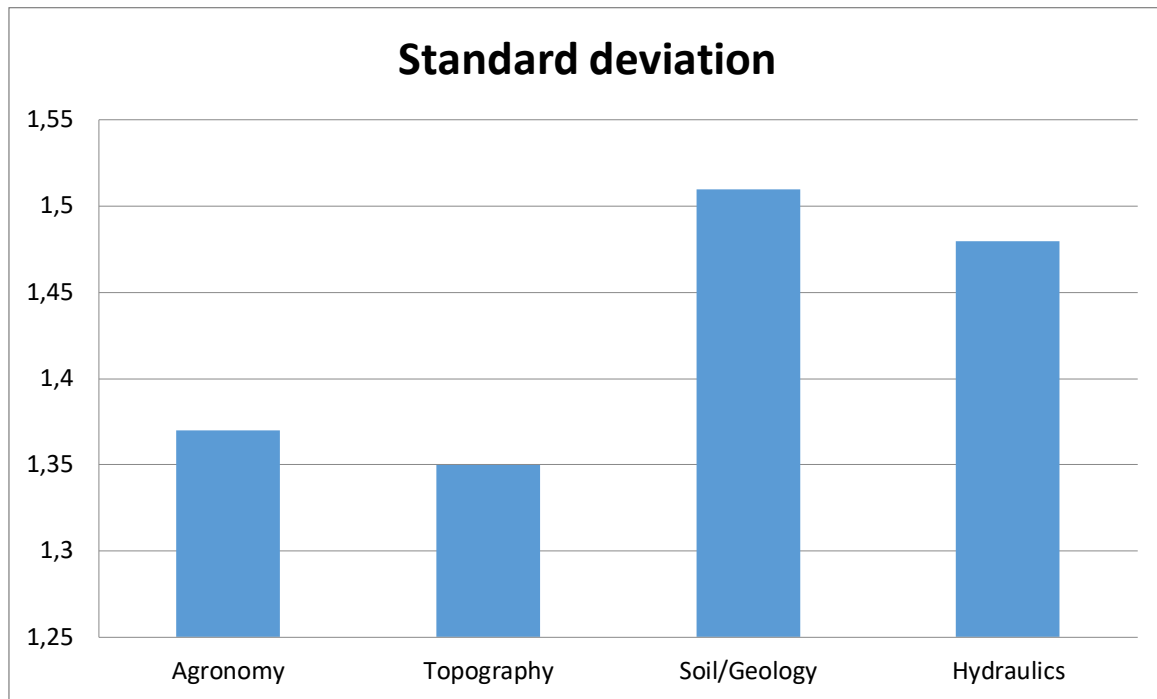
10) They mostly think within their enterprise, they need an expert in (answer n° 13):

- Geology.
- Hydraulics.



Average values





6. CONCLUSIONS

From the analysis of the different questionnaires we could appreciate that the different countries mostly gave very similar answers. The total number (335 answers) and the uniformity of data allow us to make some consideration which can help to understand the state of the art of the soil and water bioengineering sector.

6.1 Design stage

- Most of the soil and water bioengineering works are in the field of habitat protection, slope stabilisation, water resources and landscape architecture. There is a little or no participation at all in coastal erosion projects. And this missing, connected with the climate change, the forecast sea-level rise, the sea storms, and the effects of all these on human infrastructures and population, makes us to understand how much the public and private bodies must increase their knowledge of the bioengineering sector and of its potentialities;
- the most important professional roles involved in the design and in the construction stage are engineers, forestry experts; architects and surveyors;
- in some European Mediterranean countries there are not specific technical rules on soil and water bioengineering works;
- most of the respondents doesn't know about the existence of any technical rule, manuals or guidelines on soil and water bioengineering works in his country;
- most of the respondents doesn't know about the existence of EFB'S guidelines on soil and water bioengineering works in his country;
- in all the European Mediterranean countries there is:
 - Lack of software use.
 - Lack of manuals use.
 - Lack of guidelines use.
 - Lack of training courses.
- As a conclusion it can be said that there is a **clear need of specialisation at the design stage**. This specialisation process must include the generation of new or updated design tools (protocols, manuals, guidelines, websites, software, etc.) that must be accredited, shared and disseminated within the sector trough:
 - training courses organised by the professional organizations, by the universities, by soil and water bioengineering experts and by other local institutions existing in our countries;
 - specific and updated university training courses aimed to the postgraduate training level;
 - very strong dissemination activity related to the field application of Soil and Water Bioengineering, aiming to inform NGO's, local governments, insurance companies and standardization committees;
 - very strong dissemination activity about the environmental results and about the possibility to create new jobs in the field of Soil and Water Bioengineering;
- Clear benchmarks must be set and accepted within the sector.

6.2 Construction stage

- Most of the respondents (Companies, professionals.....) are aware they need a specific training in this sector, but about the 50% of them doesn't know about training courses in his country. By the way nowadays most of these courses are held by the professional organizations;
- Only the 23,4% of the works were always controlled for quality during the construction stage, and the materials controlled were mostly aggregate materials, wood, plants and the ground.
- only the 36,1% of the respondents considered in his projects a specific budget for the monitoring stage, and only the 17,1%; of the respondents declared this process was written in a simple way;
- Besides, it is also encouraging that there is a large preference in native material (but there is the 4,3% who still uses exotic plants). But only the 15,6% of the respondents say that always the planting of the vegetation requires significant amount of the construction time. The rest was either frequently (the 51,1%) or only sometimes (the 22,1%) or even no (the 11,1%);

- The works were mostly controlled for their quality during the construction stage (the 52,3%) but the rest was either frequently controlled (the 34,1%) or only sometimes controlled (the 9,1%) or even not controlled (the 4,5%);
- Most of works had a design stage (46%) but still there many works without a design stage (6,4%). (This means works done without any design).

6.3 Monitoring stage

- The budget for the monitoring soil and water bioengineering works was always took into account only by the 36,1% of the participants; the rest was either frequently considered (the 16,7%) or only sometimes considered (the 25,0 %) or even not considered (the 22,2%);
- The 28,6 % of the participants answered the monitoring process for soil and water bioengineering projects was not written in a simple and understandable way, and another 54,3% frequently but not always. This clearly indicates in many projects the monitoring process need to be **written in a simpler and more understandable way**;
- the importance of a planned maintenance stage was recognized by the participants that rated maintenance mostly with level 4 (the 32,4%) or level 5 (the 41,2%) in relation to the overall success of the operation;
- Finally the participants also pointed out that there is a gap between what was planned and the actual performance/growth of plants in soil and water bioengineering works. A small percentage declared the gap "Always" (21,9 %), and a greater percentage (the 34,4%) both declared the gap "Only sometimes" and "Frequently but not always";
- Regards to specific regulations about the monitoring and the life time maintenance of soil and water bioengineering works, the 33,3% of the participants answered that don't exist any rule, the 38,9% answered they don't not know, and only the 27,8% answered "Yes" rules exist.

All the lack points we observed in the monitoring stage are due to this last, single, missing point.

This indicates that in the monitoring stage there is the same need of specialisation we appreciated in the design stage, which should be faced in the same way, generating new or updated design tools (protocols, manuals, guidelines, websites, software, etc.) that must be accredited, shared and disseminated within the sector trough:

- training courses organised by the professional organizations, by the universities, by soil and water bioengineering experts and by other local institutions existing in our countries;
- specific and updated university training courses aimed to the postgraduate training level;
- very strong dissemination activity related to the field application of Soil and Water Bioengineering, aiming to inform NGO's, local governments, insurance companies and standardization committees;
- very strong dissemination activity about the environmental results and about the possibility to create new jobs in the field of Soil and Water Bioengineering.

It appears that clear benchmarks and standardization in methodology and workflow processes must be set and accepted within this specific European engineering sector in motion.

6.4 Training stage

- Most of the respondents are at graduate or at post graduate level, and most of them think that training courses or master level degrees in soil and water bioengineering should be very useful for them to enhance their employability;
- online training courses are seen very useful and should be attended by the majority of the respondents;
- the technical subjects (Planning, Technical drawing, Topography, GIS; Hydrology) studied by the respondents at the university are felt as the most useful for their work, and sufficient to allow them to face works of soil and water bioengineering;
- There is a shortage of professional trained in the subject of soil and water bioengineering in Europe.

6.5 Companies stage

- Enterprises need experts in soil/geology, topography, hydraulics, agronomy, but especially in geology and hydraulics;
- The common feeling of most of the companies is that this sector has the potential to expand their business. This shows that many of them understand the potential growth of the sector (the 71,7%). But at the same time a percentage (13%) answered "I don't know", that means that an awareness campaign needs to be undertaken to show the potential that soil and water bioengineering can offer to these companies and enterprises. This also follows in line with most participants (87%) saying that there has been an increasing demand for soil and water bioengineering approaches within the last decade;
- All the participants think that there are gaps in the "Planning and project skills development" in the construction phases that regard bioengineering works (Planning and design; Specialized knowledge; Construction issues; Practical knowledge on the main construction bioengineering techniques; Practical knowledge on the main maintenance bioengineering techniques);
- All the participants think that there are gaps in the "Construction management and control" phases mostly in construction direction and ability to train in particular construction details. Still improvements should also be made in the other categories as management in the field, ability to understand the particular site circumstances, ability to organize service providers and subcontractors, ability to check the quality of building materials (live and inert) and training on construction site safety and quality management;
- There is a general opinion on the lack of specialized technical staff intervening in bioengineering projects and construction, also in the maintenance and monitoring stages;
- Inside the companies employers/colleagues are felt to need training courses on soil and water bioengineering. The majority answered that there is a high need of these courses and ranked level 4 the 35,6% and level 5 the 28,9%.

6.6 Final considerations:

The soil and water bioengineering sector is missing of clear rules at national and European level. The lack of availability of rules and of updated existing rules probably is the reason of all the weak points highlighted in the 5 questionnaires.

Nowadays in all countries there are only some edited and available guidelines which are not always well known neither used by the majority of the professionals and by the companies involved in the sector. Besides they are not always available in English language (have a look to the references).

There is a clear need of specialisation at all requested stages, starting from training, the design, the construction up to the monitoring stage. A specialisation and updating process must be started and finally provided for training institutes, consultants, suppliers and companies in the construction sector.

Should be created a new generation of updated tools, like workflow schemes and protocols for designers and building companies. Also manuals, guidelines, websites, software, and so on, for all stakeholders.

It appears that clear benchmarks and standardization in methodology and workflow processes must be set, accredited, shared, accepted and disseminated within this specific European engineering sector in motion.

Finally specific master degree courses for the students and training courses for the workers are felt necessary by the majority of the respondents, but if there will be not a clear legislation of the sector, how can be held these courses?

This is a sector in which are involved many technical professionals, as engineers, architects, forestry experts, agronomists, botanists, hydraulics, geologists and so on.... Most of them declared to wish to expand their business in this field, and it will be possible easily and very quickly, if clear, new, common regulations will be created.

Enquiry's result points out that now it is time to start a based and deliberated update process of the entire working field of Soil and Water Bioengineering.

The starting point could be to update the existing guidelines and training programs in the different countries by creating, as far as possible in the European area, a standardized methodical and workflow process before and during the realization procedure of site typical light, middle and heavy resistant Soil and Water bioengineering constructions.

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18. Lindgren B. W., Statistical Theory, Chapman Hall

8. ANNEX 1: THE COVERING LETTER:

Dear Sir / Madam:

We would like to invite you to participate in a questionnaire designed to better understand the requirements necessary for an enhanced preparation of our graduates to face soil and water bio-engineering work tasks and opportunities.

This questionnaire seeks your opinion on the current state, future needs and changes to be undertaken by the soil and water bioengineering sector at the design/project stage across a range of Mediterranean countries including Spain, France, Italy, Portugal, Turkey, Macedonia and Greece.

With the soil and water bioengineering sector predicted to have an increasing role in the following years in terms of shaping our lands, it is important to ensure that those responsible for planning and managing this environment have sufficient knowledge and skills. Landslides, erosion, and floods are natural processes which negatively affect the productivity of land and ecosystem dynamics and increase soil loss and land degradation. The direct causes of these phenomena

tend to be region- specific, increasingly predicted to provide changes in short-term variation, as well as long-term gradual changes in temperature, precipitation and sea level rise, promoting additional stress on rates of soil loss.

This project has been funded with the support of the Erasmus Plus Programme of the European Union and aims to generate a sector-specific theoretical and practical syllabus, essential for the specialisation process of the Mediterranean bioengineering sector, to promote long term engagement with stakeholders of the bioengineering sector and to deliver training courses on technology programs enhanced in "Soil and Fluvial bioengineering, Hazard Assessment and Techniques Selection in the Mediterranean Environment".

The goal is to have future engineers who are ethically committed, demonstrating contemporary scientific and technological knowledge, and practical skills that will enable them to face risk and uncertainty on site whenever this is technically possible.

The questionnaire is delivered through an Online Survey Tool, which should make it easier for you to complete and submit. The questionnaire starts by asking you to provide a basic profile so that we can get to establish your specialization when interpreting the responses to a series of thematic questions. The questions are structured for you to provide an opinion based response (1 to 5), a text box for your comments, or direct answers (YES / NO) This questionnaire will not take you long, but your contribution in completing it will help to shape our proposed curriculum.

The entire monitoring procedure has been sub-classified into five different levels or stages:

- 1) Design stage;
- 2) Construction/building stage;
- 3) Maintenance and monitoring stage;
- 4) Educational/training stage
- 5) Company and Enterprises stage.

At the top side of each questionnaire you should write a code number of 4 letters. The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname.

Thank you in advance for your participation in our survey, and we would welcome any additional thoughts you have about the future direction of the project.

THE ECOMED PROJECT' PARTNERS

9. ANNEX 2: THE DESIGN STAGE QUESTIONNAIRE

9.1 The Construction stage questions



1. DESIGN STAGE

1. DESIGN STAGE

About the PERSONAL CODE:

The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname

* Mandatory field

Email address *

Personal code (4 letters/numbers) *

1. Name.

2. Gender *

☐ Male

☐ Female

1. DESIGN STAGE

3. Country of birth. *

- ☐ France
- ☐ Great Britain
- ☐ Greece
- ☐ Italy
- ☐ Republic of Macedonia (FYROM)
- ☐ Portugal
- ☐ Spain
- ☐ Turkey
- ☐ Altro: _____

4. I work in .. (Country) *

- ☐ France
- ☐ Great Britain
- ☐ Greece
- ☐ Italy
- ☐ Republic of Macedonia (FYROM)
- ☐ Portugal
- ☐ Spain
- ☐ Turkey
- ☐ Altro: _____

1. DESIGN STAGE

5. My employer is: *

- ☐ private company
- ☐ an academic institution
- ☐ a research institution
- ☐ consultancy
- ☐ NON governmental organisation
- ☐ government or local authority (ministry, municipality)
- ☐ Altro: _____

6. I am working predominantly as a: *

- ☐ designer
- ☐ contractor
- ☐ subcontractor
- ☐ client
- ☐ supervisor/manager of soil/water bioengineering projects
- ☐ student
- ☐ Altro: _____

7. My highest degree of education is: *

- ☐ BSc
- ☐ MSc
- ☐ PhD
- ☐ Altro: _____

1. DESIGN STAGE

8. My age group is: *

- ☐ <20
- ☐ 20-30
- ☐ 30-40
- ☐ 40-50
- ☐ 50-60
- ☐ >60

9. My position in the company is: *

- ☐ graduate engineer
- ☐ technician
- ☐ senior engineer
- ☐ consultant
- ☐ owner
- ☐ board member
- ☐ director
- ☐ CEO
- ☐ Altro: _____

10. My e-mail address is:

1. DESIGN STAGE

11. Do you give your consent to your e-mail being included in the ECOMED mailing-list?

☐ YES

☐ NO

12. I am aware of the educational requirements in other countries for securing a job.

1 Not aware 5 Fully aware

1 2 3 4 5

☐ ☐ ☐ ☐ ☐

13. If you are not actually working in practice in bioengineering or your are a student, "please, SKIP THE FIRST THREE QUESTIONNAIRES and complete ONLY the fourth questionnaire (Training Stage)."

☐ I am a student

☐ I am not actually working in soil and water bioengineering subjects

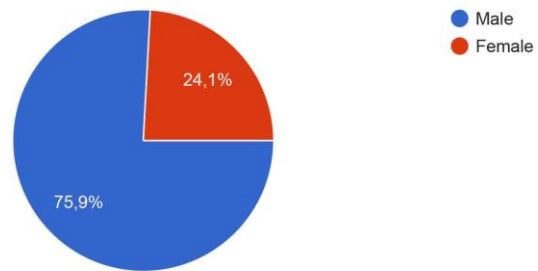
☐ I am actually working in soil and water bioengineering subjects

☐ Altro: _____

PLEASE DESCRIBE YOUR EXPECTATIONS FOR THE SOIL AND WATER BIOENGINEERING SECTOR

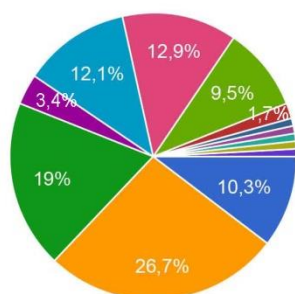
The answers to the PERSONAL INFO questions:

2. Gender



3. Country of birth.

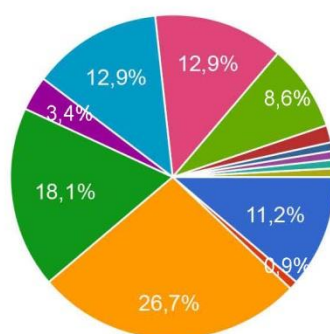
2019-2020



▲ 1/2 ▼

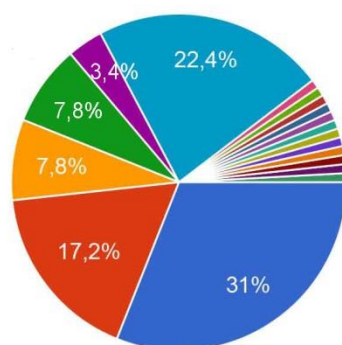
4. I work in .. (Country)

2019-2020



▲ 1/2 ▼

5. My employer is:

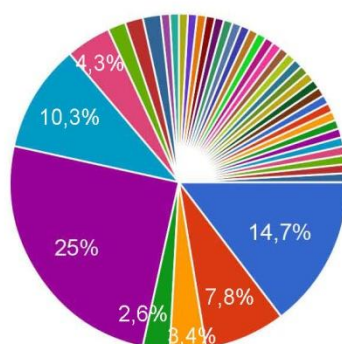


- private company
- an academic institution
- a research institution
- consultancy
- NON governmental organisation
- government or local authority (minis...)
- Profession libérale
- freelancer

▲ 1/3 ▼

6. I am working predominantly as a:

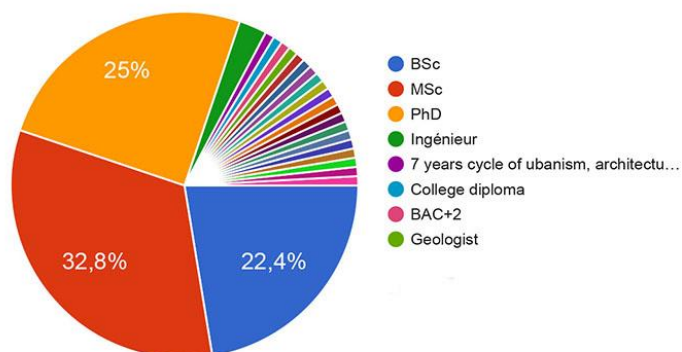
100% 99% 98% 97% 96% 95% 94% 93% 92% 91% 90% 89% 88% 87% 86% 85% 84% 83% 82% 81% 80% 79% 78% 77% 76% 75% 74% 73% 72% 71% 70% 69% 68% 67% 66% 65% 64% 63% 62% 61% 60% 59% 58% 57% 56% 55% 54% 53% 52% 51% 50% 49% 48% 47% 46% 45% 44% 43% 42% 41% 40% 39% 38% 37% 36% 35% 34% 33% 32% 31% 30% 29% 28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8% 7% 6% 5% 4% 3% 2% 1% 0%



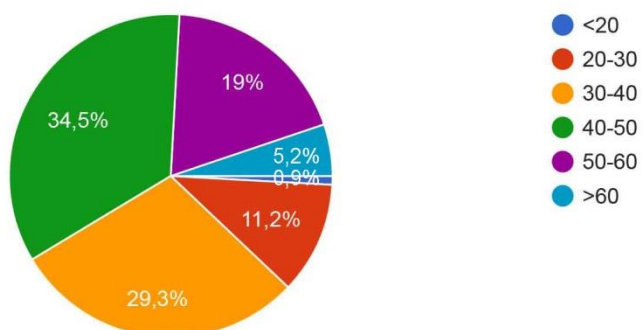
- designer
- contractor
- subcontractor
- client
- supervisor/manager of soil/water bi...
- student
- Researcher
- Professor

▲ 1/6 ▼

7. My highest degree of education is:

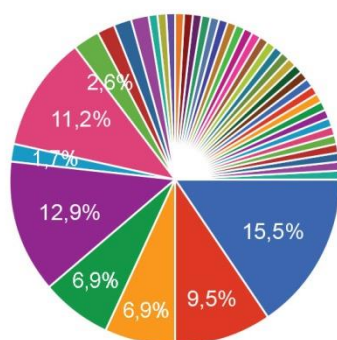


8. My age group is:



9. My position in the company is:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



- graduate engineer
- technician
- senior engineer
- consultant
- owner
- board member
- director
- CEO

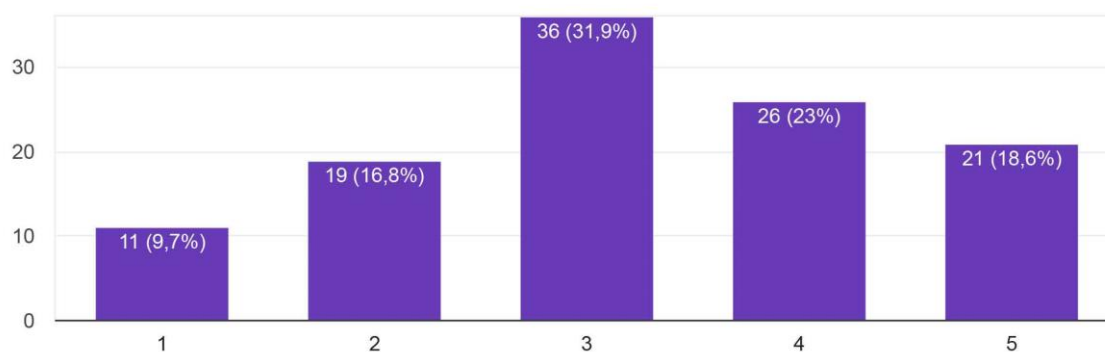
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10. My e-mail address is:

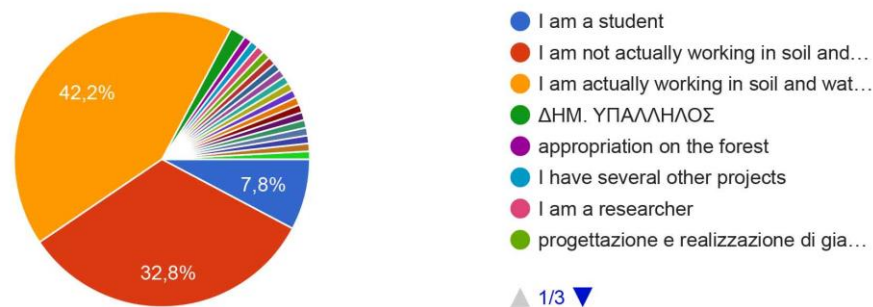
11. Do you give your consent to your e-mail being included in the ECOMED mailing-list?

12. I am aware of the educational requirements in other countries for securing a job.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



13. If you are not actually working in practice in bioengineering or your are a student, "please, SKIP THE FIRST THREE QUESTIONNAIRES and complete ONLY the fourth questionnaire (Training Stage).



PLEASE DESCRIBE YOUR EXPECTATIONS FOR THE SOIL AND WATER BIOENGINEERING SECTOR

- Lern new approches (2)
- I seek above all to exercise an activity that guarantees both residents' satisfaction and the proper use of public funds by ensuring the preservation and restoration of naturally functioning ecosystems. Therefore our competences needs to be able to think outside normal parameters and produce viable and innovative solutions. In particular the field of geotechnical knowledge of stabilized slopes and riverbanks by bioengineer's solutions should be considerably increased.
- increasing in demand in the future, extensive training and formation required is the future of some civil engineer works
- It is the creation of politics that will enable sustainable use of natural resources (such as soil and water).
- It is a broad question. The design and plan of the bioengineering projects should be nature friendly.
- Growth of implementation of the techniques - working with Nature
- This sector is growing up for the next years
- High expectations
- conseil des maitres d'ouvrage et donne des autorisations de travaux pour des protections de berges de cours d'eau
- increase in its importance day after day
- it's useless...
- I am a student
- I am not actually working in soil and...
- I am actually working in soil and wat...
- ΔΗΜ. ΥΠΑΛΛΗΛΟΣ
- appropriation on the forest
- I have several other projects
- I am a researcher
- progettazione e realizzazione di gia...
- very good expectations
- land degradation neutrality
- Credo fermamente nell'Ingegneria Naturalistica

- Control erosion
- Improvement of technical accuracy in design and construction and greater dissemination
- Nature base solutions will lead in the future as the new strategy for smart cities and will definitely over throne the basic concrete building model
- Προστασία του εδάφους και των υδάτων
- Normalisation du génie végétal permettant le dimensionnement des ouvrages de ce type (paramètre de calculs, coefficients de sécurité...)
- I seek above all to exercise an activity that guarantees both residents' satisfaction and the proper use of public funds by ensuring the preservation and restoration of naturally functioning ecosystems. Therefore our competences needs to be able to think outside normal parameters and produce viable and innovative solutions. In particular the field of geotechnical knowledge of stabilized slopes and riverbanks by bioengineer's solutions should be considerably increased.
- Our goal is to build and preserve a 'clean' environment by taking advantage of technological innovations and offers innovative technical solutions for rivers and watercourses by working with, rather than against the nature. In France, actually this activity is uncommon and existing assurances do not cover steep slope bioengineering work activity with the consequence that these techniques cannot be applied because they do not protect the designer in case of failure. I expect a great change of the practice of assurances in concert with an inevitable evolution of EUROCODE 7 (this geotechnical normativ still doesn't integrate 80 years of bioengineering experience in Europe!).
- sustainability
- Increasingly safeguard the soil, water and therefore the environment
- Mieux connaître les conséquences des aménagements en génie végétal sur le milieu et l'influence réelle dans les cours d'eau à l'aval de l'aménagement.
- Development of the use bioengineering along rivers and slopes, but also in cities
- a lot more need to be done and shared
- analysis in nitrate on the ground
- cleaner water and soil
- j'attends un développement plus important
- I hope it could increase in the future because its implementation is needed
- Los cojones
- They are limited, it is a very specialized sector.
- Recuperación ribera río Tajo - Aranjuez
- La bioingeniería tiene mucho potencial de desarrollo especialmente en el ámbito mediterráneo
- Cada vez es más importante. Veo un interés especial de las Administraciones Públicas en incluir aspectos de bioingeniería en obras de ingeniería civil.
- proposing mitigation measures for environmental protection
- Enhancement of educational program

9.2 The second part of the questionnaire related to personal skills

1. DESIGN STAGE

1. Which areas of soil and water bioengineering do you work in?

1 Lower,.... 5 Max value

	1	2	3	4	5
Soil protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slope stabilisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forest hydric regime control activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
River basin revitalisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coastal protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodiversity/ habitat protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green walls/roofs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable drainage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscaping / Landscape architecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geographical Information System (GIS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. If Other, please describe and rate from 1 to 5

3. On average, how many soil-water bioengineering works are you involved in annually?

☐ 1

☐ 2-5

☐ >5

☐ Altro:

1. DESIGN STAGE

4. In which area of soil and water bioengineering do you consider yourself an expert?

1 Low..... 5 High

	1	2	3	4	5
Soil protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slope stabilisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forest hydric regime control activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
River basin revitalisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coastal protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodiversity/ habitat protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green walls/roofs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable drainage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscaping / Landscape architecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geographical Information System (GIS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. What of the following environmental problems do you require to consider during design stage within your country?

- ☐ Slope stability, solifluxion or other kind of soil movement
- ☐ Wide tidal range of watercourses during growth stage
- ☐ Severe aridity during growth stage
- ☐ Severe precipitation during growth stage
- ☐ Invasive species
- ☐ Altro: _____

1. DESIGN STAGE

6. If Other, please describe and rate from 1 to 5

7. Did your technical knowledge allow you to easily tackle the soil-water bioengineering works?

- ☐ Always
- ☐ Frequently, Not always
- ☐ Only sometimes
- ☐ Not at all
- ☐ Not applicable
- ☐ Other
- ☐ Altro: _____

8. Does your work concern steep slope stabilization with bioengineering methods?

- ☐ YES
- ☐ NO
- ☐ Altro: _____

9. If YES, do you apply geotechnical preliminary studies with the aim to establish the choice of the best stabilization technique?

- ☐ YES
- ☐ NO
- ☐ Altro: _____

1. DESIGN STAGE

10. If YES, what kind of approach do you apply?"

- ☐ Soil sampling
- ☐ Laboratory analyses
- ☐ Geotechnical software/modelling program
- ☐ Site survey and/or in situ testing
- ☐ Decision support program/software
- ☐ Other method

11. When you have to design a soil-water bioengineering works, what level of specialization do you need in:

1 Lower..... 5 Max value

	1	2	3	4	5
Biotechnology – plant science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pedology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geotechnique– geotechnical engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydraulics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Material technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Do you currently use any software for soil-water bioengineering design?

- ☐ All the time
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ Not at all
- ☐ Altro: _____

1. DESIGN STAGE

13. If you use any software please list here:

14. Are you satisfied with the performance and coverage of your geotechnical software in relation to soil and water-bioengineering problems?

☐ YES

☐ NO

15. If NO, what are the issues you would like to have solved?

16. Do you currently use any guidelines/manuals to carry out your soil-water bioengineering designs?

☐ All the time

☐ Frequently but not always

☐ Only sometimes

☐ No

☐ Altro: _____

1. DESIGN STAGE

17. If you use guidelines/manuals, please list them here:

18. Do you have any ISO certification?

- ☐ YES
- ☐ NO
- ☐ Altro: _____

19. If YES, please detail here:

20. Do specific regulations about the design of soil-water bioengineering works exist in your country?

- ☐ YES
- ☐ NO
- ☐ I don't know
- ☐ Altro: _____

1. DESIGN STAGE

21. If YES, please list them here:

22. Have you ever heard about EFIB'S "European Guidelines of Soil and Water Bioengineering"?

- ☐ YES
- ☐ NO

23. Do you use these guidelines for your work?

- ☐ All the time
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ No
- ☐ Altro: _____

24. Do specific training courses about the soil-water Bioengineering works design exist in your country?

- ☐ YES
- ☐ NO
- ☐ I don't know actually

1. DESIGN STAGE

25. If yes, give some examples here:

26. What specific training course on soil/water bioengineering works do you need?

27. Have any of your employees/colleagues received any continuous professional development related to soil/water bioengineering works?

- ☐ YES
- ☐ NO
- ☐ Not aware
- ☐ Not applicable
- ☐ Altro: _____

1. DESIGN STAGE

28. If YES, to what extent are these undertaken?

1 Lower..... 5 Max value

	1	2	3	4	5
professional organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
seminars/talks/workshops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
part time academic courses at universities / other HEI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
conferences / symposia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
research projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
self-taught / web based modules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. If Other, please provide examples here:

30. Do specific regulations about planting exist in your country ?

- ☐ YES
- ☐ NO
- ☐ I don't know

31. If YES, please list them here:

1. DESIGN STAGE

36. Do you think a soil-water bioengineering work should be an inter-disciplinary work, or it should involve only the sector specialists?

- ☐ interdisciplinary work
- ☐ sector specialists
- ☐ both in case of intricate project design
- ☐ Altro: _____

37. According to your experience, which variables could address the soil and water bioengineering work particularities when compared to a traditional civil engineering work?

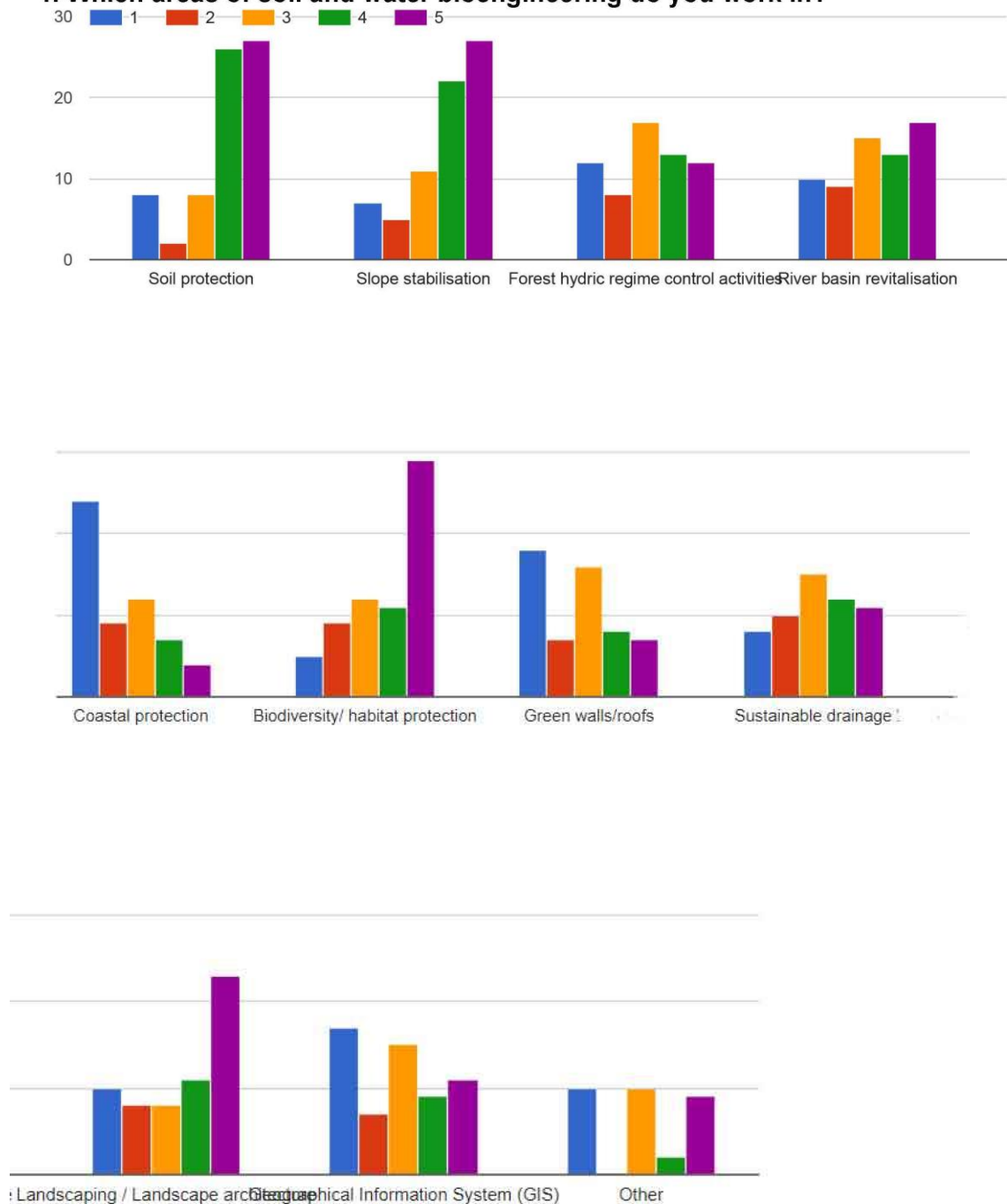
PLEASE DESCRIBE THE KEY ASPECTS WHICH YOU WOULD INCREASE DURING THE DESIGN STAGE IN ORDER TO ENHANCE THE SUSTAINABILITY PERFORMANCE OF BIOENGINEERING WORKS"

Web site:

www.ecomedbio.eu

9.3 Responses to the second part of the design questionnaire:

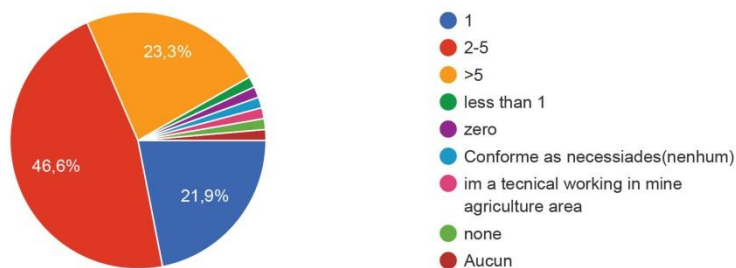
1. Which areas of soil and water bioengineering do you work in?



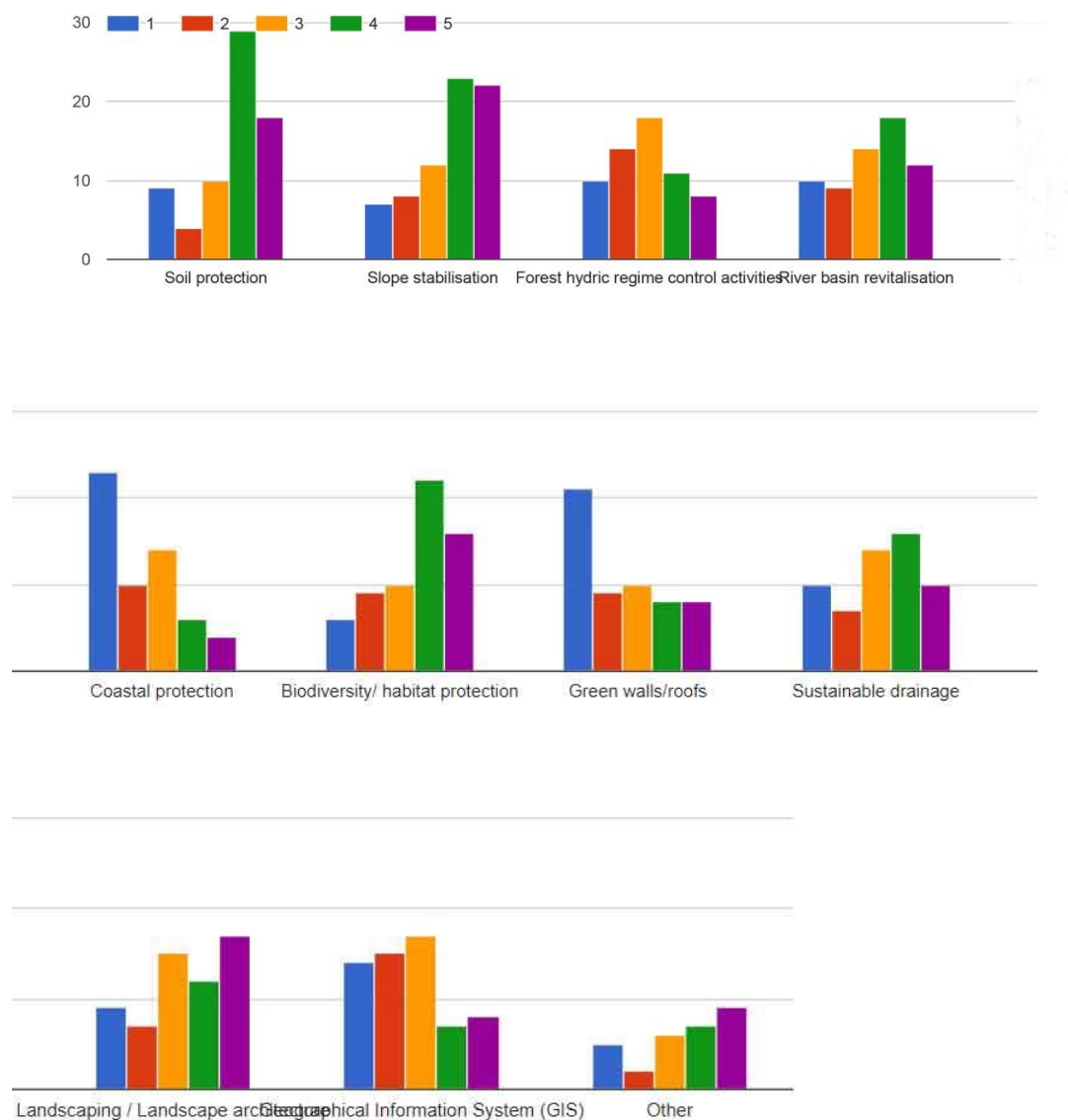
2. If Other, please describe and rate from 1 to 5

- Technical analyze/diagnostic advice in landscaping and soil stabilization, expert report, regulatory framework, project design; contract drafting, operating organisation and monitoring, wealth and structural 'end of life' management (2)
- Conservation of forested ecosystems/Silviculture (2)
- Stream bank protection, fish and wildlife habitat creation
- Forest ecosystem rehabilitation or ecological restoration
- Dans le cadre du conseil pour des travaux de protection de berge j'essaye de convaincre les maitres d'ouvrages de recourir à une technique de protection de berge en génie végétal ou mixte (végétal mort et vivant)
- Infraestruturas (linhas de água, edificios, estabilização de taludes, etc)
- land pianification
- sustainable rural development 5 , land degradation neurtality 5 sustainable land management 5, forest pest control 5,
- Projelerin yapım aşaması 5
- Pipelines protection and wave protection in dam embankments (shoreline)
- προστασία δασών
- conservation management endangered raptors/forest/National Parks
- renaturation (5) diversité écologique (3)
- Riiverbank protection 5
- groundwater, ecosystems, natural resources, water management
- Continuité écologique des cours d'eau
- Sensibilisation
- tasa 5,639
- River restoration - 5
- Recuperación vegetación ribera río Tajo - Paisajismo

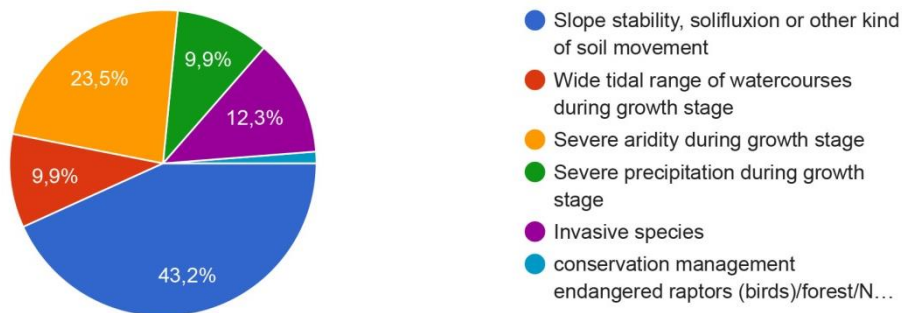
3. On average, how many soil-water bioengineering works are you involved in annually?



4. In which area of soil and water bioengineering do you consider yourself an expert?



5. What of the following environmental problems do you require to consider during the design stage within your country?

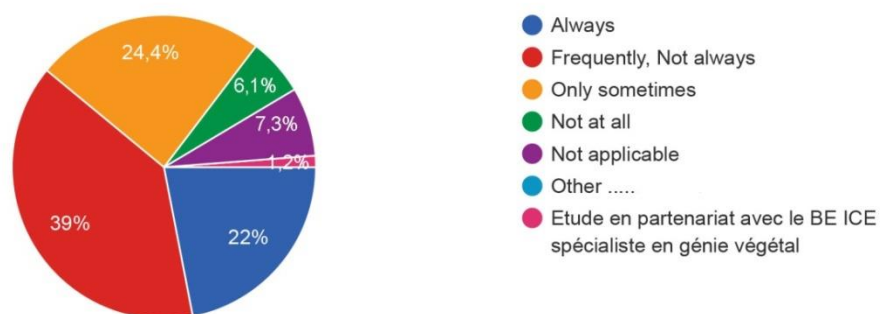


6. If Other, please describe and rate from 1 to 5

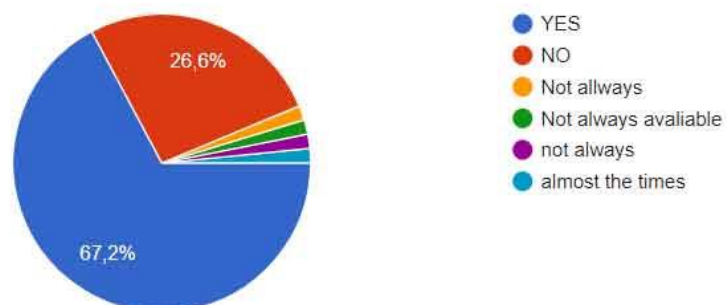
- Creation of fish habitat 5
- In the 5th question, the answers are not mutually exclusive In my opinión , the invasive species , or the precipitation , you need to consider it
- Invasive species, tidal range, bank erosion
- Degradación del río Tajo y sus riberas
- Invasive species (4)

7. Did your technical knowledge allow you to easily tackle the soil-water bioengineering works?

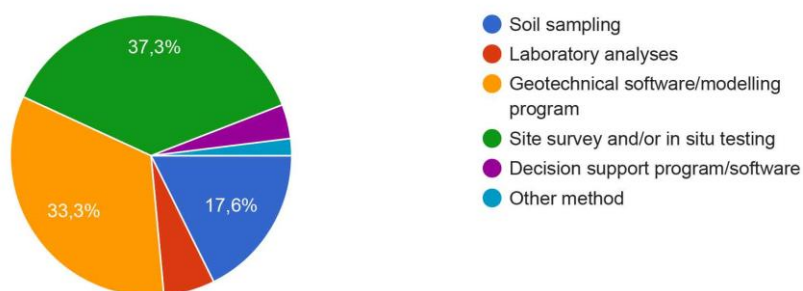
Figure 7



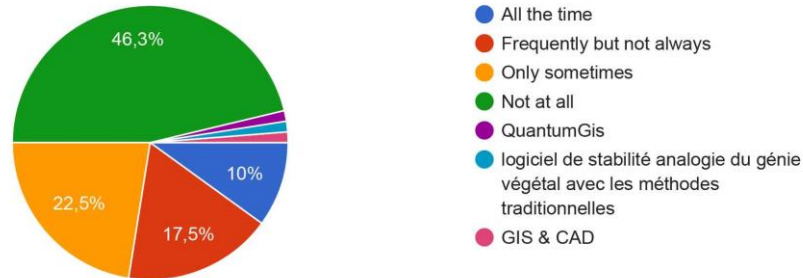
9. If YES, do you apply geotechnical preliminary studies with the aim to establish the choice of the best stabilization technique?



10. If YES, what kind of approach do you apply?"



12. Do you currently use any software for soil-water bioengineering design?

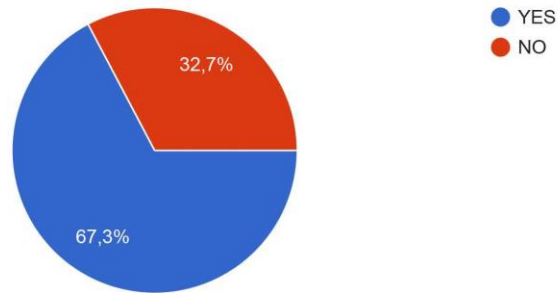


13. If you use any software please list here:

- 1D and 2D hydrodynamical software; geotechnical software (2)
- GIS (2)
- Cad based drawing
- AutoCAD
- ArcCIS
- Aztec
- geostru
- autocad
- ArcGIS, SAGAGIS, GRASSGIS, R, phyton, ENVÍ, STATA,
- Autocad
- Arq Gis
- Programas de CAD e sistemas de informação geográfica
- AutoCad
- ArcGis 10
- TALREN
- GIS & CAD
- COMSOL, etc
- QGis
- Rido
- HEC-HMS, HEC-RAS, CAD, GIS, EXCEL, ...
- Plaxis - Geo 5; MacStars; Galena; Slide;
- Plaxis, Geo5, Huesker Stability, Slide

GEO 5, Plaxis

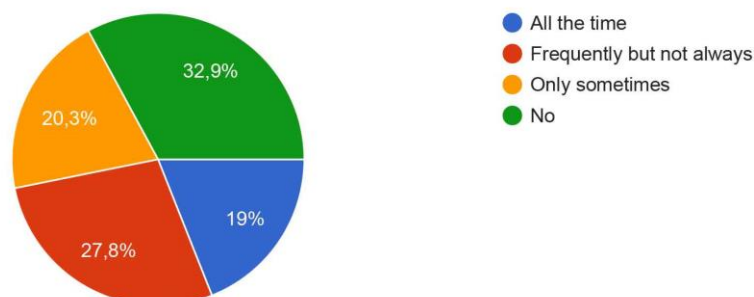
14. Are you satisfied with the performance and coverage of your geotechnical software in relation to soil and water-bioengineering problems?



15. If NO, what are the issues you would like to have solved?

- Not use a software (2)
- Current available and legal accepted software doesn't consider root growth variabilities
- dDo not use it
- The plant participation
- Method selection
- assenza di mercato e cultura scientifica nel paese
- ter software adeguado
- Calculo de volumes de terra
- Printing is not simple
- Absence de paramètres de dimensionnement du génie végétal et coefficients de sécurité
- The software results have no binding force for assurances and EUROCODE requirements; this is urgently to rectify

16. Do you currently use any guidelines/manuals to carry out your soil-water bioengineering designs?

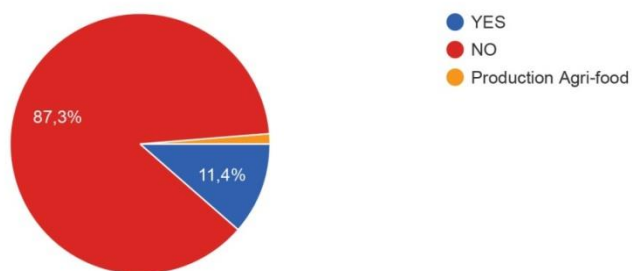


17. If you use guidelines/manuals, please list them here:

- 2007 H.ZEH "Soil Bioengineering Construction type manual"; 2012 E.Hacker and R.Johannsen "Ingenieurbiologie"; 2013 Ministère de l'Ecologie France "Le génie végétal - Manuel technique"; 2013 BAW Karlsruhe – Institut Fédéral des Voies Navigables et de Recherche "Navigable Waterways - Biological techniques of riverbank protection"; 2015 EFIB "European Guidelines for Soil and Water Bioengineering"
- I do have an extensive library
- Manual EFIB
- Manuali Lazio Ingegneria naturalistica, EFIB Guidelines, Soil Bioengineering construction type manual, Efib Handbook,...
- circular letter of corporate
- Documents (Manuals and Guidelines) of General Directorate of Forest and General Directorate of State Water Affairs
- Biotechnical and Soil Bioengineering Slope Stabilization: A Practical Guide for Erosion Control. Donald H. Gray, Robbin B. Sotir 1996 Fifield, J.S., 2001. Designing for Effective Sediment and Erosion Control on Construction Sites. Forester Press, California.
- Quaderno di Cantiere - Regione Lazio; MANUALE DI INDIRIZZO DELLE SCELTE PROGETTUALI PER INTERVENTI DI INGEGNERIA NATURALISTICA - PODIS; Manuale tecnico di Ingegneria Naturalistica della Provincia di Terni; Soil Bioengineering Construction Type Manual - EFIB
- le genie vegetal, ministere de l'écologie
- Quaderni ISPRA
- Manual for afforestation
- arpa guideline
- Vários

- manuali ASSOCIAZIONE ITALIANA PER L'INGEGNERIA NATURALISTICA
- Ecoregions of Turkey, Afforestation and Erosion Control Studies, Afforestation Guide, Biogeography of Turkey, Guide Afforestation and Rehabilitation of Arid and Semiarid Areas, Global Guidelines for the restoration of degraded forests and landscapes in drylands, Land use classification based on ecological condition of Turkey, The Guideline for Erosion and Flood control from ÇEM (General Directorate of Desertification and Erosion)
- Yayınlarımız. Orman Genel Müdürlüğü tarafından çıkarılmış yayınlar
- you tube
- H. Schiechl books, Regione Lazio manuals, D. Gray books, Morgan & Rickson books, USDA manuals, Coppin & Richards book, EFIB manual, etc
- "European Guidelines of Soil and Water Bioengineering"
- 2007 H.ZEH "Soil Bioengineering Construction type manual"; 2012 E.Hacker and R.Johannsen "Ingenieurbiologie"; 2013 Ministère de l'Ecologie France "Le génie végétal - Manuel technique"; 2013 BAW Karlsruhe – Institut Fédéral des Voies Navigables et de Recherche "Navigable Waterways - Biological techniques of riverbank protection", Germany; 2015 EFIB "European Guidelines for Soil and Water Bioengineering";
- Génie végétal en rivière de montagne
- Schiechl, Gray and Sotir, Adam, Zeh...
- Restoration manual
- Mostly those released by UN
- Google
- visual protocols
- El Kiko
- MANUAL DE TÉCNICAS DE RESTAURACIÓN FLUVIAL (CEDEX), ESCALAS Y PASOS DE PECES (O.A. PARQUES NACIONALES), ...
- Normas Tecnológicas de Jardinería y Paisajismo (NTJ). Fundació de la Jardineria i el Paisatge. // Manual de técnicas de ingeniería naturalística en el ámbito fluvial. Gobierno Vasco, 2002 // Manuale di ingegneria naturalistica applicabile al settore idraulico. Regione Lazio. // Manuale di Ingegneria Naturalistica. Volume 3: Sistemazione dei versanti. Regione Lazio. // Ingeniería biológica, Manual Técnico. Editorial Verein für Ingenieurbiologie,
- Euro Code 7; Product Installation Guidelines;
- EC7; Product installation guidelines; ISO
- GEO 5 and Plaxis manual, material producers guidelines
- Technological guidelines delivered by specialized associations or entities

18. Do you have any ISO certification?

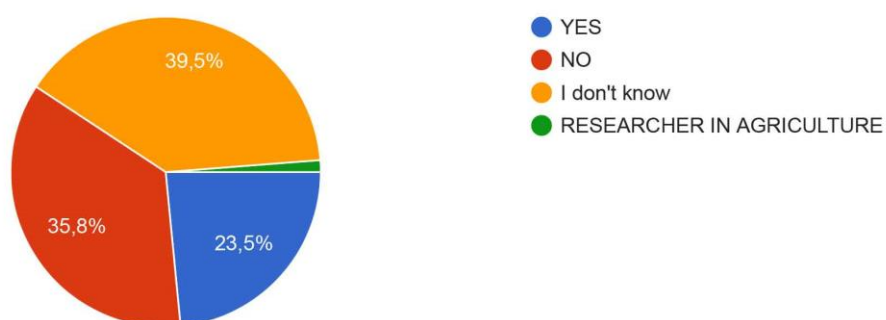


19. If YES, please detail here:

8 answers:

- ISO 9.000 and 14.000
- 9001
- No. es información privada
- ISO 9001 e ISO 14001
- ISO 17025; ISO 14001;
- ISO 9001, ISO 14001, OHSAS 18001, ISO 17025.
- ISO17025; ISO14001
- ISO 9001

20. Do specific regulations about the design of soil-water bioengineering works exist in your country?

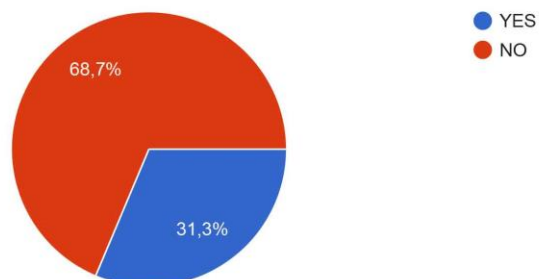


21. If YES, please list them here:

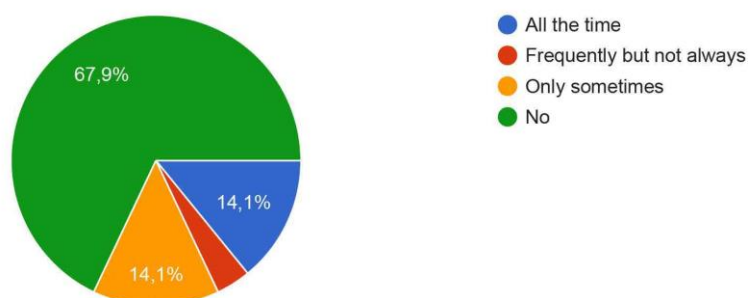
16 answers

- NF X10-900 Octobre 2012: "Génie écologique - Méthodologie de conduite de projet appliqué à la préservation et au développement des habitats naturels - Zones humides et cours d'eau"
- NTJ -12 S
- General Directorate of State Water Affairs
- Rangeland law, forest law, soil protection law
- A list of action plans from General Directorate of Desertification and Erosion; National Action Plan of Combatting Desertification and Erosion, Upper catchment flood control action plan, Action plan of DAM catchments green afforestation, Action plan of Combating erosion,
- Oluşan afete göre yıllık programlar alınır
- NF X10-900 Octobre 2012: "Génie écologique - Méthodologie de conduite de projet appliqué à la préservation et au développement des habitats naturels - Zones humides et cours d'eau";
- Loi sur l'eau
- Declaration form and authorization request
- must follow international standards
- EQUIPOS DE PODA, SIEGA Y MANTENIMIENTO DE SISTEMAS AJARDINADOS
- Law on Waters; Law on Environment;
- Law on waters, Law on environment.
- Law on waters; Law on environment
- Technological guidelines delivered by specialized associations or entities

22. Have you ever heard about EFIB'S "European Guidelines of Soil and Water Bioengineering"?

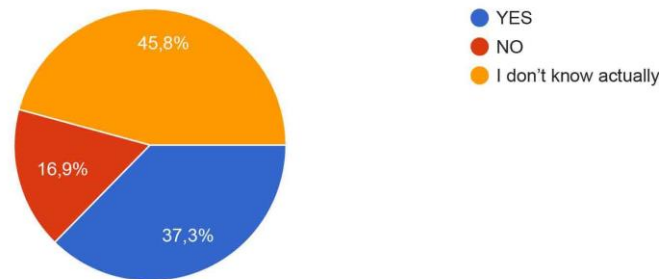


23. Do you use these guidelines for your work?



24. Do specific training courses about the soil-water Bioengineering works design exist in your country?

30 answers



25. If yes, give soem examples here:

30 answers:

- http://www.cfpf.org/modules/xskkcatalogue/index_formation.php?id=55
<http://www.formation.drome.cci.fr/fiche-formation/items/effectuer-la-maitrise-doeuvre-en-genie-vegetal.html>
- Short 1 to 3 days workshop targeted at specific audiences
- Courses from the Asociación Española de Ingeniería del Paisaje in Catalonia, Madrid , Andalusia and Basque country www.aeip.org.es
- Oficina Engenharia Natural Montis
- We gave some at our University School
- Our company promote those courses
- restauration morpho-ecologique des cours d'eau au moyen de pratiques issues du génie végétal
- Governmental training courses
- orsi organizzati dall'AIPIN
- Forest service provide internal training and universities provide workshops for those people
- All courses of AEIP in Spain
- 0.03
- CORSI ASSOCIAZIONE ITALIANA PER L'INGEGNERIA NATURALISTICA
- Different goal oriented workshops has been given in our organization and related organizations.
- AIPIN
- Cursos de introdução a engenharia natural
- Kurumumuz tarafindan yapılan eğitimler
- Workshops in Universities and several courses organized by NGOs
- EcoSalix workshops
- I give some training courses and lectures in universities in Brazil
- http://www.cfpf.org/modules/xskkcatalogue/index_formation.php?id=55

<http://www.formation.drome.cci.fr/fiche-formation/items/effectuer-la-maitrise-doeuvre-en-genie-vegetal.html>

- CFPF Chateauneuf sur Rhône, Biotec
- local and national level
- WORKING PLACE REASEARCER IN XANTHI GREECE
- No
- VARIOS DE LA ASOCIACIÓN ESPAÑOLA DE INGENIERÍA DEL PAISAJE
- Los que organiza la Asociación Española de Ingeniería del Paisaje
- Training coursed organized periodically by AEIP

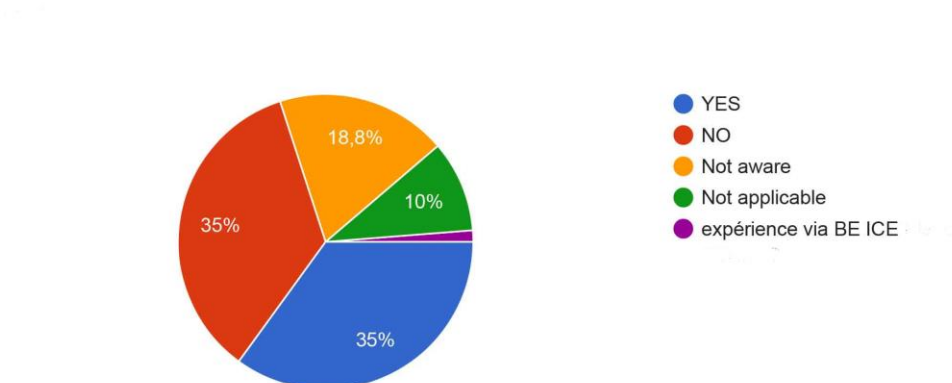
26. What specific training course on soil/water bioengineering works do you need?

37 answers:

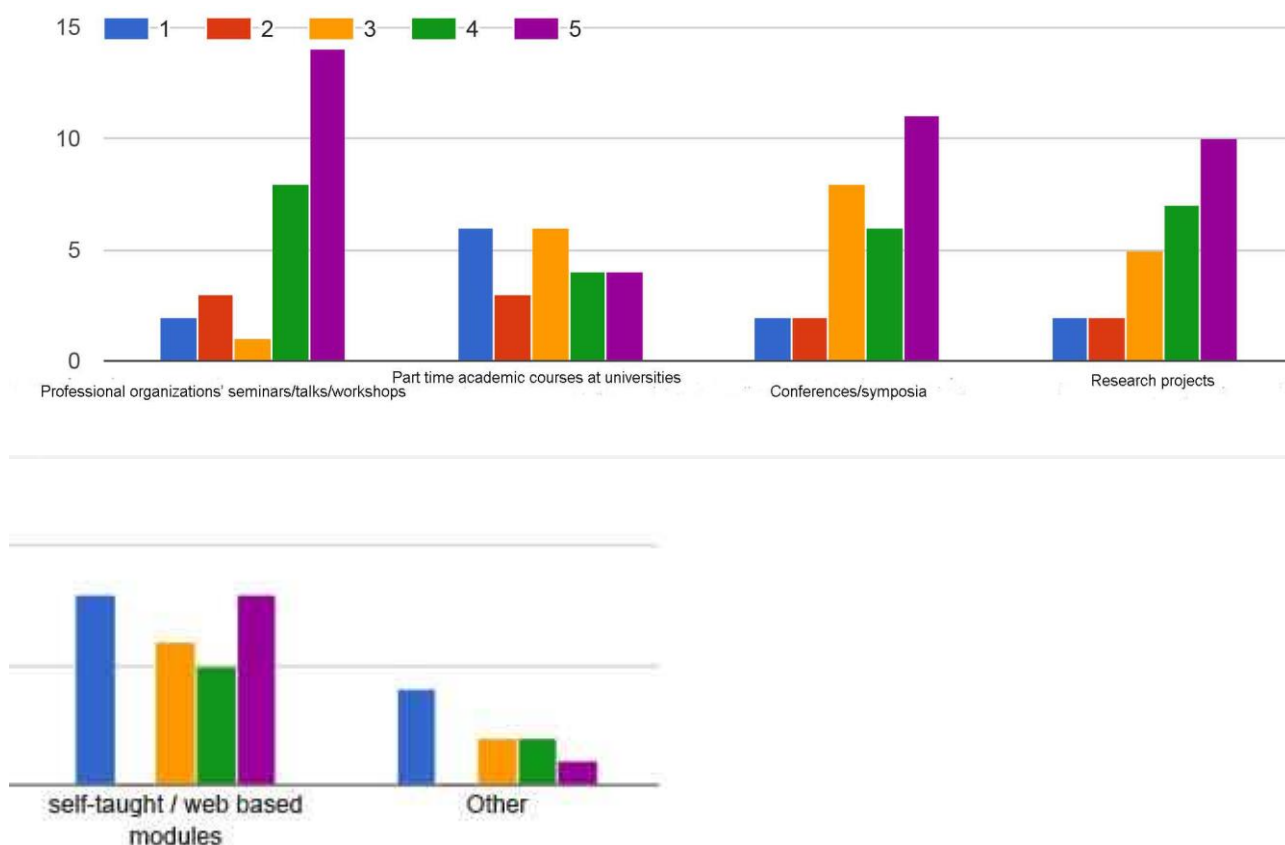
- I do not know (2)
- Hydrodynamic; géotechniques and root growth
- I always interested in learning, mostly resistance values, but I also teach occasional workshop.
- Soil/water Bioengineering in urban river revitalisation , Soil/ water Bioengineering structures calculation
- I don't need at the within my work now.
- I need to use software for soil-water bioengineering design
- I think yes.
- software programs for bioengineering desing
- Stabilità dei versanti ed uso dei software
- expertise on plant material
- realization and design
- Geotechnical
- initiation
- PROGETTAZIONE GEOTECNICA E GEOTECNICA E CALCOLI STRUTTURALI OPERE DI INGEGNERIA NATURALISTICA
- Tecnicas de estabilização em solos vulcanicos, estabilização de taludes em areas naturais
- jeoloji ve hidroloji
- Stabilization of slopes, Reduction of water erosion on mountain forest paths
- Soil and water bioengineering for slope stability and landslides
- technical information about different strategies and practice workshop's
- Global
- Geotechniques and root growth as a function of soil type
- watershed management
- La stabilisation de berge avec des venues d'eau en dessous du lit de la rivière.
- existing courses are ok
- Restoration oriented
- those that involve emerging technologies
- SAMPLES OBSERVING DIFFERENT PERIOD TIME
- specialized ecoengineering for the Mediterranean
- Como joder al prójimo
- practical
- Recuperación paisajística de riberas, eliminación de cañas, etc...
- Cálculos de estabilidad
- New technologies for hydro seeding
- new technologies for drainage

- Training course on EFIB'S

27. Have any of your employees/colleagues received any continuous professional development related to soil/water bioengineering works?



28. If YES, to what extent are these undertaken?

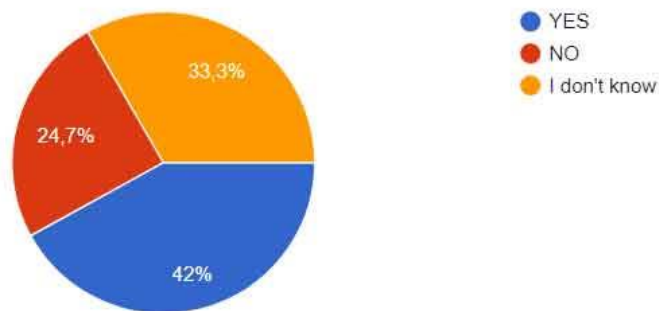


29. If Other, please provide examples here:

3 answers :

- jobsite visits
- formation par des groupes privés
- expérience via BE ICE

30. Do specific regulations about planting exist in your country ?



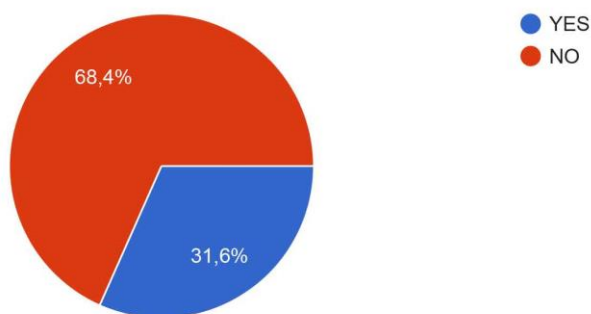
31. If YES, please list them here:

18 answers :

- It depends if you deal with Natura areas etc. (2)
- Fascicule n°35 "Aménagement paysagers et"
- Only in Natura 2000 Protected sites
- erosion kontrol and afforestation general instruction
- Regulations and Guidelines of General Directorate of Forest
- Range Law, Forest protection Law, Soil conservation Law
- forest service ragulations for plantation works
- 13
- Proteção do Patrimonio Florestal, regime Juridico da Conservação da natureza e da proteçãa da biodiversidade
- General Directorate of Forestry and General Directorate of Combating Desertification and Erosion
- C.C .T.P. fascicule n°35 « Aménagements paysagers ... »
- Pour ce qui nous concernent les CCTP des marchés les définissent.
- certified plant material
- local and national level
- I do not know the names

- Ley 30/2006 de Semillas y Plantas de Vivero y Recursos Fitogenéticos, Ley 3/2000 de Régimen jurídico de la Protección de las Obtenciones Vegetales, R.D.170/2011 de Reglamento General del Registro de Variedades Comerciales, Real Decreto 1891/2008, de 14 de noviembre, por el que se aprueba el Reglamento para la autorización y registro de los productores de semillas y plantas de vivero y su inclusión en el Registro nacional de productores, Reglamento General sobre Producción de Semillas y Plantas de Vivero, Reglamento General Técnico de Control y Certificación de Semillas y Plantas de Vivero
- Regulación planta empleada. Pasaporte fitosanitario

32. Have you ever set a suitable quality certification for the blending (mixing) of seeds, as a designer?



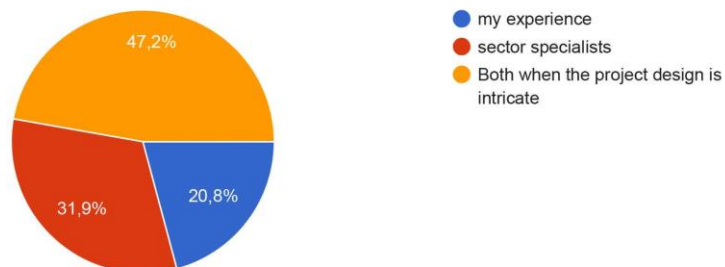
33. If NO, please describe why not

24 answers :

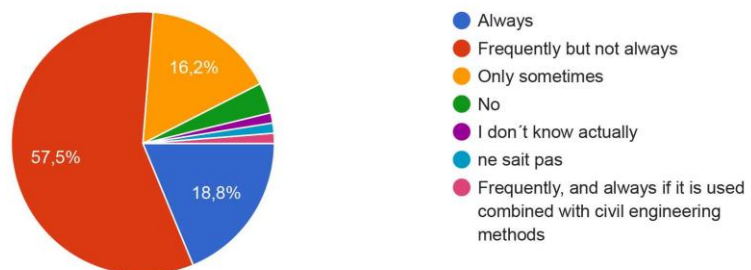
- Not having the opportunity. I usually use specific species (2)
- no supplier for local seeds available
- I didn't need.
- Promotion of natural processes, meaning the maximization of previous present seeds.
- ?
- We were producing the plants that were collected on site
- sometimes it is hard to obtain our native species seeds
- never had the need
- 13
- non applicabile
- -----
- NON NE HO ANCORA AVUTO NECESSITÀ
- As espécies seleccionadas apenas foram utilizadas em testes.

- It will be better if we'd set.
- Seeds not yet available
- nous sommes uniquement des utilisateurs
- Not useful for researchers
- was not required
- Not part of my responsibility
- pas concerné
- not needed
- No hemos plantado nada

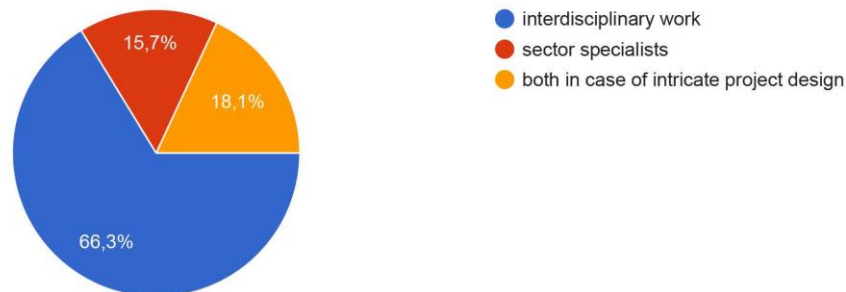
34. Did you plan just on the basis of your experience or did you ask for collaboration of sector specialists?



35. Do you think the soil and water bioengineering approach is more cost-effective when compared to other engineering methods?



36. Do you think a soil-water bioengineering work should be an inter-disciplinary work, or it should involve only the sector specialists?



37. According to your experience, which variables could address the soil and water bioengineering work particularities when compared to a traditional civil engineering work?

44 answers:

- Type of vegetation (2)
- / (2)
- Very short realization period in fluvial work needs high organization experience of work monitoring and execution company 2) long term high tide periods during construction stage are disturbing workflow and funding
- Plant knowledge and combination with civil engineering
- Landscape, resilience
- The scale of the analysis is bigger, the botanical , hydrological and geological studies are important, the the solutions are diversives in order to achive the ecological objectives of the work
- Direct and indirect impacts on ecosystems; future capacity of ecosystem evolution and not only create a static environment
- The existence of natural events that you can not control
- vegetation type and density, soil type and precipitation type and pattern
- Vegetation, periods for planting, raining periods,..
- Continuous efficiency, internal stabilization of soils through root systems, aesthetic aspect and landscape integration
- biodiversité, plus résistant dans le temps, aspect naturel
- Plant and ecology
- Incertezza nella durata dell'opera e costi di realizzazione spesso incerti ed apparentemente non competitivi con le opere tradizionali
- Using the most suitable plant species
- in one word "flexibility"
- Watershed management
- Custos e baixa manutenção

- PROGETTO BOTANICO
- Geotecnica, Agraria e forestale
- Em áreas sísmicas, a utilização de madeira em relação ao betão traz mais resistência à estrutura perante a ruptura.
- Ekstrem olaylar ..Kuraklık,yüksek ve düşük sıcaklıklar,şiddetli rüzgar ve fırtınalar,aşırı yağışlar
- The use of plants
- altitude, climate, soil types, geological situations etc.
- Plants and their propagation forms
- landscape impact, biodiversity and riparian gallery protection, multi functionality of the intervention, nature conservation, soil protection, visual impact, climate change mitigation, fire prevention...
- Χλωρίδα, Πανίδα, εξέλιξη βλάστησης, διάβρωση πρανών κλπ
- Accès, règles environnementales, intégration paysagère
- good integration in landscape; no soil and vegetation loss; often lower costs in realization and maintenance
- life organisms, rear species, biodiversity conservation, ecosystem complexity
- la stabilité immédiate du haut de berge quand au dessus viens se rajouter un ouvrage qui n'accepte aucun tassement, type : route, bâtiment...
- Adaptative and sustainable techniques
- those related to resilience and sustainability
- PHYSICAL METHODS
- the element of vegetation is more difficult to predict compared to inert material
- landscape integration and habitat protection
- Cobro por dicha respuesta
- Earth walls, flood Risks, waste water treatment, water infiltration, fish passes, ...
- La conservación de la biodiversidad, implicar a los ciudadanos y la restauración paisajística.
- La capacidad de infiltración del suelo así como su potencial de escorrentía
- La diferencia principal es que no sólo valen los cálculos estructurales, también existen otros factores importantes por lo que se hace necesario la colaboración de distintos sectores (ingenieros, biólogos, etc)
- Better adaptation to the hydromorphological and ecological features of the study area - Better related to the recent evolution and plausible future trajectory of the study area - Larger supply of ecosystem services

PLEASE DESCRIBE THE KEY ASPECTS WHICH YOU WOULD INCREASE DURING THE DESIGN STAGE IN ORDER TO ENHANCE THE SUSTAINABILITY PERFORMANCE OF BIOENGINEERING WORKS”

33 answers:

- Stabilize the banks and find the proper plant species for each suited area (2)
- In my activity as SWB first I need better knowledge in view of geotechnical aspects in steep riverbank and terrestrial slopes, second I need increased hydrodynamical knowledge
- Knowledge of plant and living material i.e. importance of dormancy period, stock handling, soaking until installation. Selection of appropriate species.
- 1The scale of the analysis is bigger 2- The in situ survey is imperative 3- the botanical , hydrological and geological studies are necessary 4-the solutions are diverser in order to achieve the ecological objectives of the work
- The long term planning
- biological or ecological aspects should be included in such projects
- It should be obligatory to present hydraulic, soil and vegetation studies in the design phase.
- Selection of Natural growing plant materials
- Migliorare i capitolati di appalto ed adottare schede tecniche dei materiali che aiutino i progettisti a fare modellazioni di progetto più analitiche
- a detailed site survey and identification of best plant material for this particular engineering work
- environmental monitoring
- Para um melhor equilíbrio dos ecossistemas e biodiversidades das espécies
- MODELLAZIONE GEOTECNICA E STRUTTURALE, PROGETTO BOTANICO E PIANO DI MANUTENZIONE DELLE OPERE
- Geotecnica e forestale
- Modelado 3D do terreno, utilização de UAV
- The use of native plants
- geotechnical structural design
- Improve the knowledge about plant material that could be used in Mediterranean country, raise awareness about the multi functionality of the soil bioengineering technics
- Normalisation du dimensionnement des ouvrages de génie végétal
- In my soil and water bioengineering activity first I need better knowledge in view of geotechnical aspects related to steep riverbank and terrestrial slopes, second I need increased hydrodynamical knowledge to a better assessment of mechanical riverbed resistance
- le bon choix des végétaux selon la localisation de l'aménagement.
- A careful choice and implementation of plant material
- those related to resilience and sustainability
- PHYSICAL METHODS ARCHITECTURAL DESIGN
- Better understanding of the vegetative components of the methods
- Votar a corruptos.
- Plant/seeds selection knowledge (mechanical behavior, existence in nurseries, procurement cost, Phytosociology, ...)
- Tener en cuenta la sostenibilidad de cara a futuro.
- La capacidad de infiltración del suelo

- Higher possible relation with the flow, geomorphic and ecologic pattern of the river/system -
Harmonization between river protection and maintenance of the river's critical dynamics -
Adaptation to the multifunctional managerial goals required by the EU policies (WFD, FRD, BHD, etc.).

10. ANNEX 3: THE CONSTRUCTION STAGE QUESTIONNAIRE

10.1 The Construction stage QUESTIONS

2. CONSTRUCTION STAGE

About the PERSONAL CODE:

The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname

*** Mandatory Field**

Email address *

My Personal Code (4 letters/numbers) *

Name

Age *

Gender *

☐ Male

☐ Female

1. In what type and how many soil and water bioengineering works have you been involved in?

	1	2-3	4-5	>5
Water resource management (riverine)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental conservation/protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coastal erosion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slope stabilisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OTHER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. If OTHER, please detail.

3. Which is usually your role during the construction stage?

- ☐ Contractor, subcontractor, principal contractor
- ☐ Project manager
- ☐ Director, CEO, strategic management
- ☐ Designer
- ☐ Technician
- ☐ Surveyor
- ☐ Client
- ☐ Altro:

4. If OTHER, please describe which role this is:

5. Usually, before the construction stage, was there a design stage where the utilised technique was justified?

- ☐ Always
- ☐ Frequently, but not always
- ☐ Only sometimes
- ☐ No

6. To what extent did the following professional roles play a part in the design stage?

least involvement 1 most involvement 5

	1	2	3	4	5
Engineer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Architect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surveyor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forestry expert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil and water bioengineering engineer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OTHER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. If OTHER, please detail here:

8. In your experience, were the construction standards given by the designers applied to the works?

- ☐ Always
- ☐ Frequently, but not always
- ☐ Only sometimes
- ☐ No

14. 9. If YES, which standards were applied?

15. 10. Was the quality controlled during the construction stage of the works you were involved in?

- ☐ Always
- ☐ Frequently but not Always
- ☐ Only sometimes
- ☐ No

11. If YES, which materials or elements were controlled?

lower value 1 higher value 5

	1	2	3	4	5
Aggregate materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ground	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. If Other, please describe and rate from 1 to 5

13. Do you think the employed workforce is sufficiently qualified for this type of works?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ No

14. Usually, does the planting of vegetation require significant amount of the total construction time?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ No

15. Which method was mostly used for planting ?

lower value 1 higher value 5

	1	2	3	4	5
Cutting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rooted Plant bedding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sodding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OTHER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. If OTHER, please describe and rate from 1 to 5:

17. Which living materials were mostly used?

- ☐ Live branches
- ☐ Stakes
- ☐ Cuttings
- ☐ Saplings
- ☐ Seedlings
- ☐ Rooted trees
- ☐ Container grown trees
- ☐ Altro: _____

18. If OTHER, please describe:

19. Did you experience any difficulties in obtaining the desired/specified plant species? *

- ☐ Always
- ☐ frequently but not always
- ☐ Only sometimes
- ☐ No

20. Did you collect the live material in nearby areas?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ No

21. Did you use autochthonous (native) or exotic species in your soil and water bioengineering work?

- ☐ Autochthonous (native) species
- ☐ Exotic species
- ☐ Both

22. Did you use any hormone treatment or mycorrhizae?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ No

23. Was it necessary to use any pest control while preserving the plant species?

- ☐ Always
- ☐ frequently but not always
- ☐ Only sometimes
- ☐ No

24. Did you use treated or untreated timber?

- ☐ Treated timber
- ☐ Untreated timber
- ☐ Both

25. How did you preserve the living materials during the construction stages?

26. Do you usually supervise your works?

- ☐ Always
- ☐ frequently but not always
- ☐ Only sometimes
- ☐ No

27. If NOT, what qualification had the supervisor?

	1	2	3	4	5
Engineer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agronomist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Architect	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surveyor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forestry expert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil and water bioengineer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. The construction stage was carried out by:

- ☐ A consortium of different specialised companies
- ☐ Only one company but trained in bio-engineering works
- ☐ Other _____

29. If the construction stage was realized by a consortium of different specialised companies

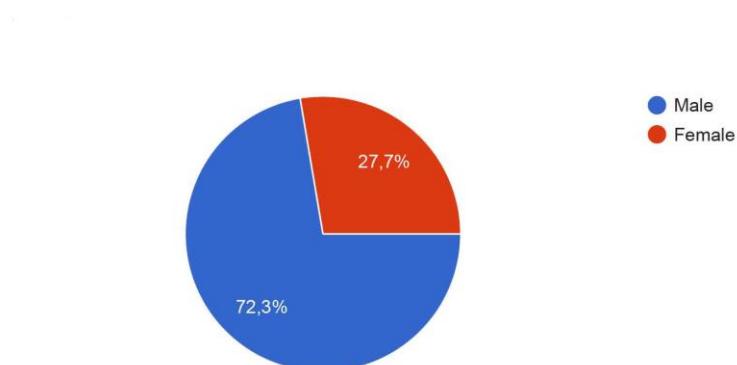
- ☐ A site assessor was assigned to do on-site workflow organisation between the different companies
- ☐ Nobody was assigned to control on-site workflow
- ☐ Other _____

30. According to your experience, which are the most common errors/issues you have identified during the construction stage?

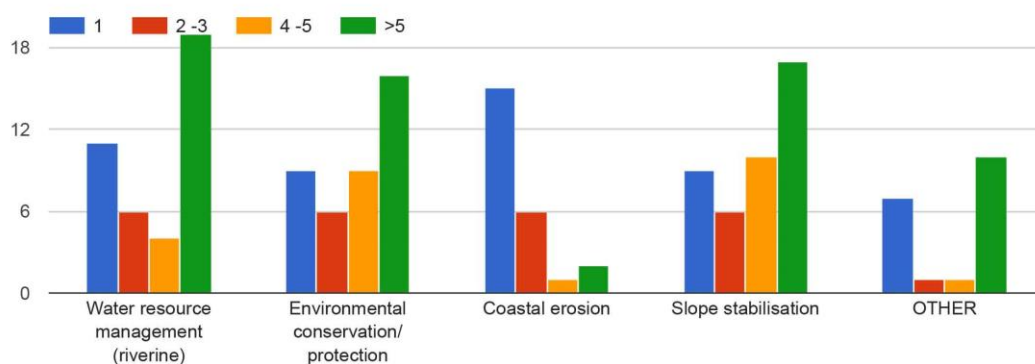
PLEASE DESCRIBE THE KEY ASPECTS WHICH YOU FEEL SHOULD BE ENHANCED DURING THE CONSTRUCTION STAGE IN ORDER TO IMPROVE THE SUSTAINABILITY PERFORMANCE OF BIOENGINEERING WORKS

10.2 The Construction stage ANSWERS

Gender



1. In what type and how many soil and water bioengineering works have you been involved in?



2. If OTHER, please detail.

Answers:

1

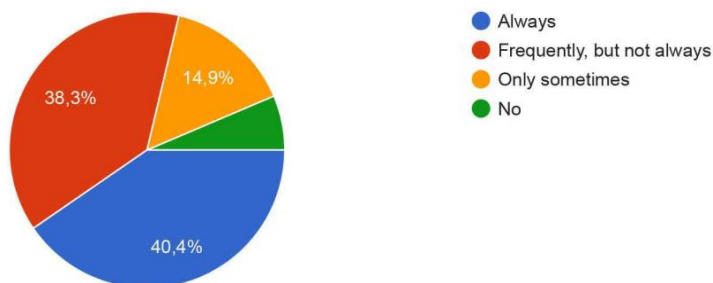
Land restoration

erosion and sediment control and drainage infrastructure protection (Storm water outfalls

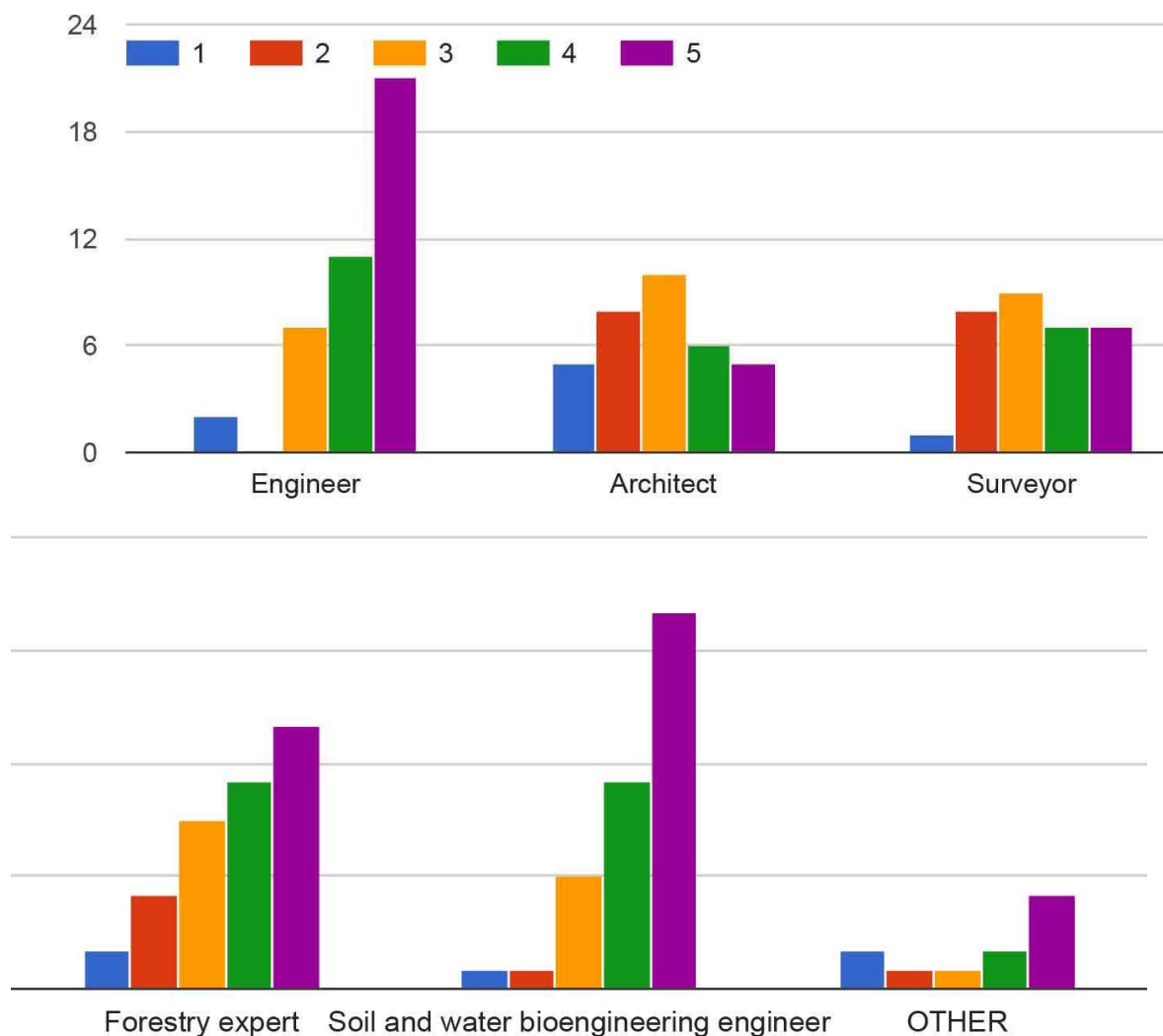
Stormwater

Landscape projects

5. Usually, before the construction stage, was there a design stage where the utilised technique was justified?



6. To what extent did the following professional roles play a part in the design stage?



7. If OTHER, please detail here:

Other

Other

Geotechnical and hydraulics engineer

Soil & water bioengineering specialist

Landscape architect

Enterprise Managers

geologist

Workers

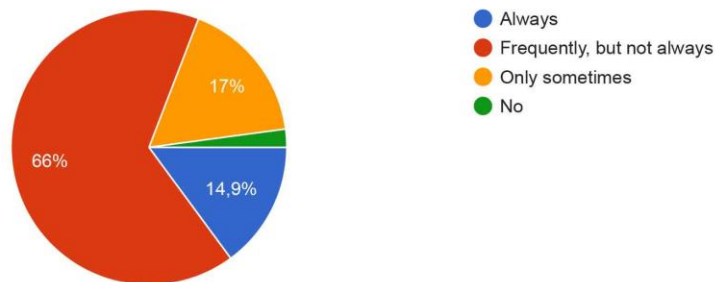
Biologist

local communities and other stakeholders

Geólogo

8. In your experience, were the construction standards given by the designers applied to the works?

47% 100%



9. If YES, which standards were applied?

47% 100%

own standards based to my experience and also EFIB standards

The difficulty is to get the engineer and the contractor to complies with the specifications, often due to the lack of understanding and or the underestimation of the practice.

NTJ -12 S (Normas técnicas de Jardinería y Paisajismo- 12 S)

LE GENIE BIOLOGIQUE B.LACHAT

Construction methods

road banks stabilizations standarts,

não me lembro

The cost efficiency

It depends on the designer

DTU

Riverbank and slope bioengineering standards

Based in Greek legislation

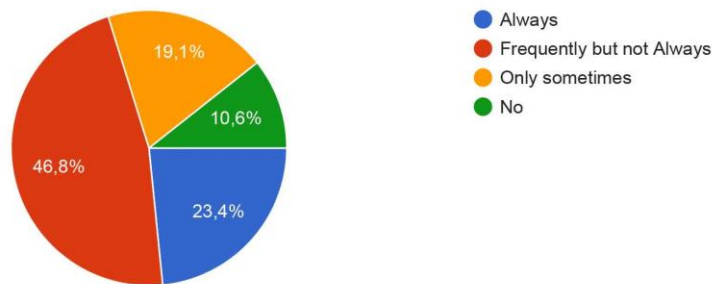
Las del Ministerio del Medio Ambiente

El pliego de las obras

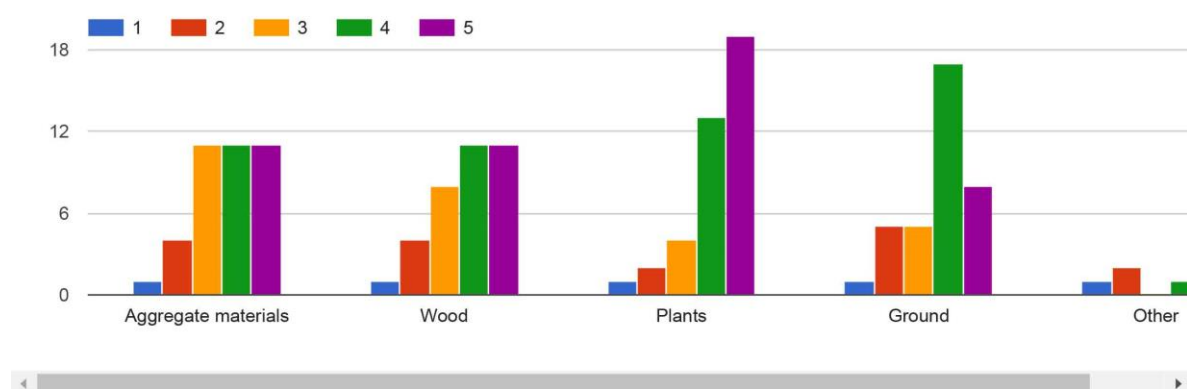
EUROCODE, Local standards

10. Was the quality controlled during the construction stage of the works you were involved in?

47% 100%



11. If YES, which materials or elements were controlled?

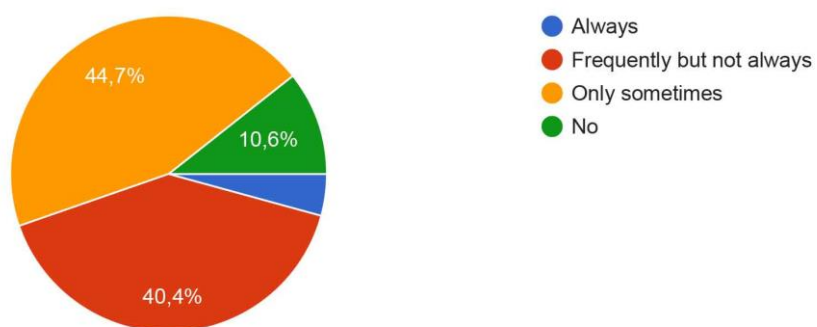


12. If Other, please describe and rate from 1 to 5

grey material like rip-rap and 3D structure and gabion structure

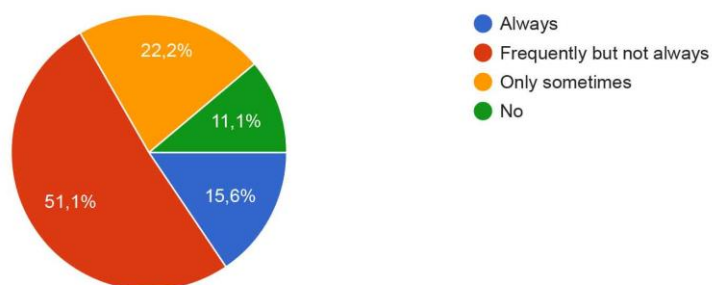
Organic matters : Biorulles, blankets, hydroseeding materials

13. Do you think the employed workforce is sufficiently qualified for this type of works?

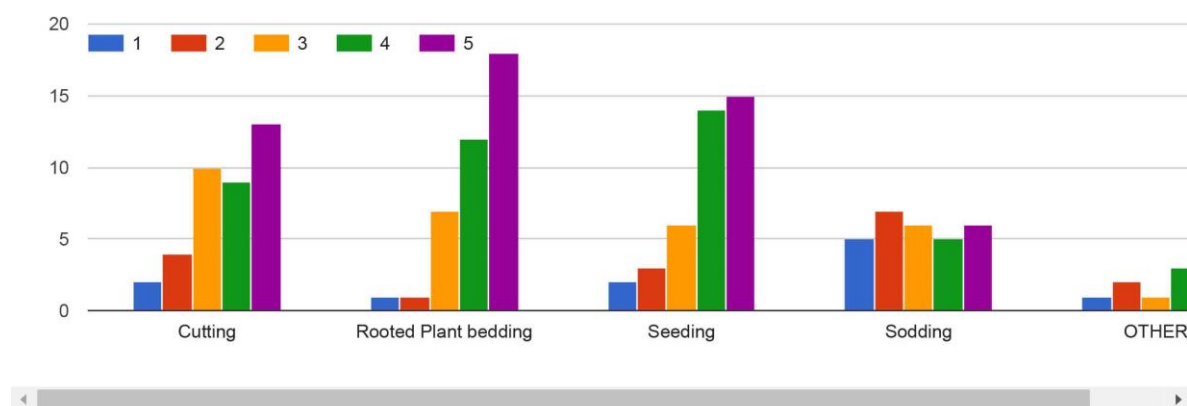


14. Usually, does the planting of vegetation require significant amount of the total construction time?

Answers: 84%



15. Which method was mostly used for planting ?



16. If OTHER, please describe and rate from 1 to 5:

Hydroseeding

Hydroseeding

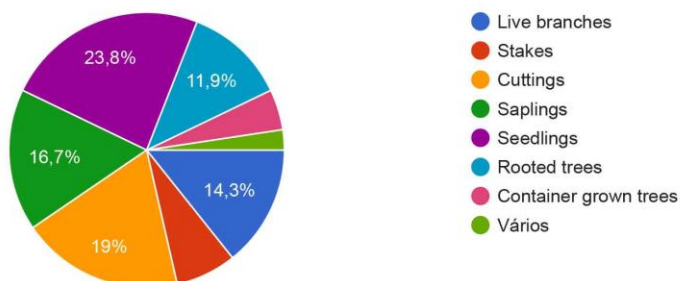
2 Hydroseeding, 1 manual gathering and seeding; 2 large tree transplantation, 2 container and pot planting

direct planting of seedlings

talea

Hydroseeding, seedlings

17. Which living materials were mostly used?



18. If OTHER, please describe:

Combination of live cuttings, rooted plants, seeding etc...

All of the describe ones

Combination of live cuttings, rooted plants, seeding etc...

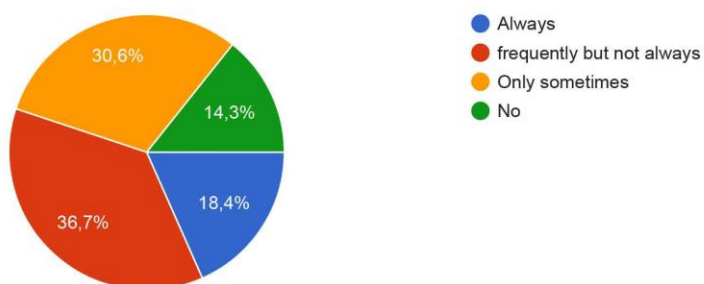
All of the describe ones

Live branches, Stakes, cuttings, seedlings, ... depends on the technic do you use..

All the above

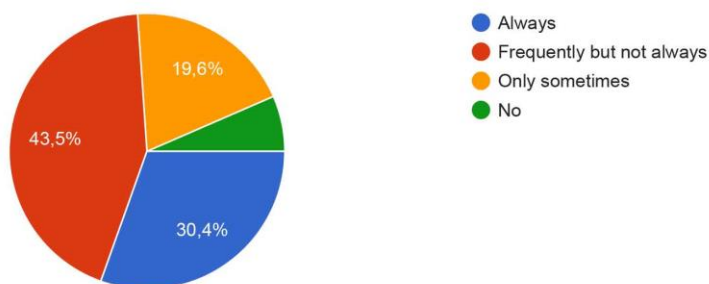
ramas, esquejes, arbustos y plantas a raíz desnuda.

19. Did you experience any difficulties in obtaining the desired/specified plant species?



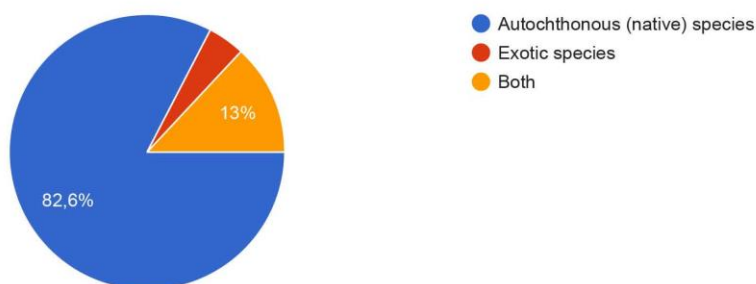
20. Did you collect the live material in nearby areas?

Figure 20



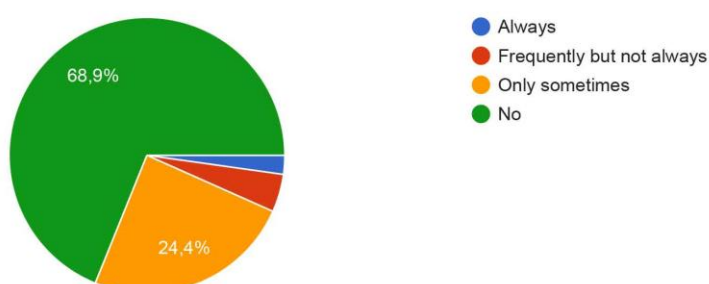
21. Did you use autochthonous (native) or exotic species in your soil and water bioengineering work?

Figure 21

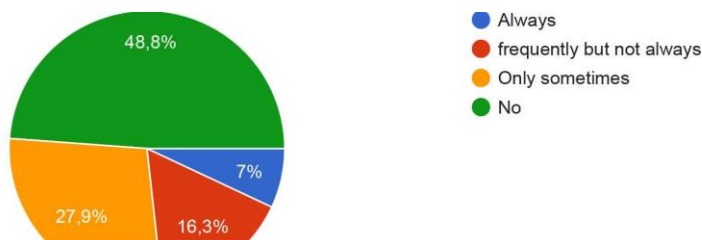


22. Did you use any hormone treatment or mycorrhizae?

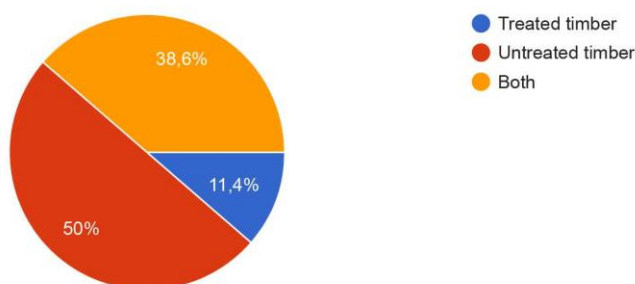
Figure 22



23. Was it necessary to use any pest control while preserving the plant species?



24. Did you use treated or untreated timber?



25. How did you preserve the living materials during the construction stages?

following the rules defined in fascicule n°35 "Landscape works": protection during transport and realization of a "vegetation stockyard"

cold storage and soaking in the shade on site

In special basins

in water or in humid sand

We usually use it daily, sometimes we store it in cold weather storage.

in cold place

COUPES ET LIVRAISONS A L'AVANCEMENT DES TRAVAUX

Fresh location and temporary irrigation

traditional methots

KEEPING ROOT SYSTEM MOIST

adequate conservation

MISE EN JAUGE TERRE OU SABLE ET ARROSAGE SI NECESAIRE

Var olan canlılar koruma altına alındı

Living materials only go to the constructions when it is needed

Em viveiro

In water or shadow

rarement mis en jauge car entre le prélèvement et la pose on n'excède pas 24 h.

soaking

experts assisted

Common ways

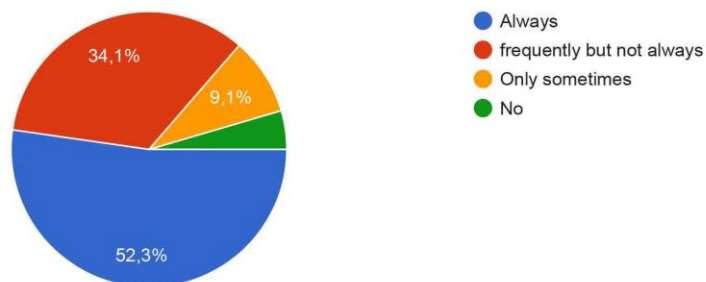
Hay poco mantenimiento

Cepellón en contenedor. A raíz desnuda en arena de río húmeda

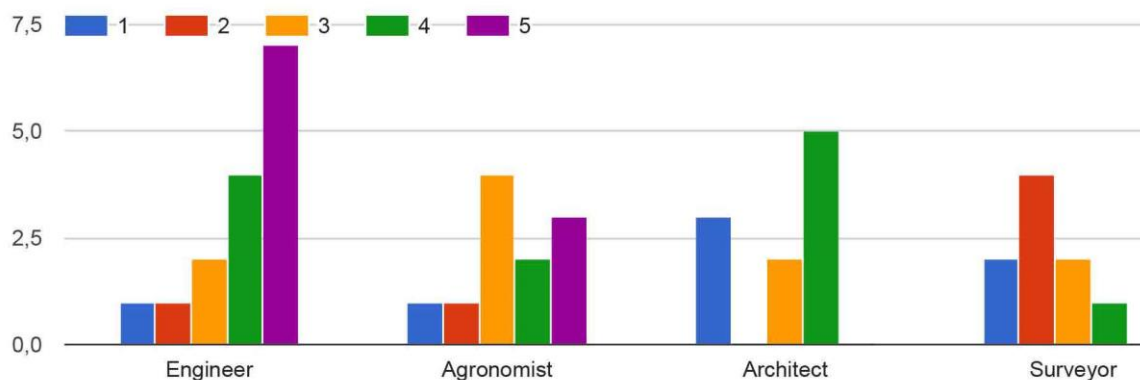
Se acopian, por no mas de dos días, cerca de la obra, tapados con una lona o en la sombra

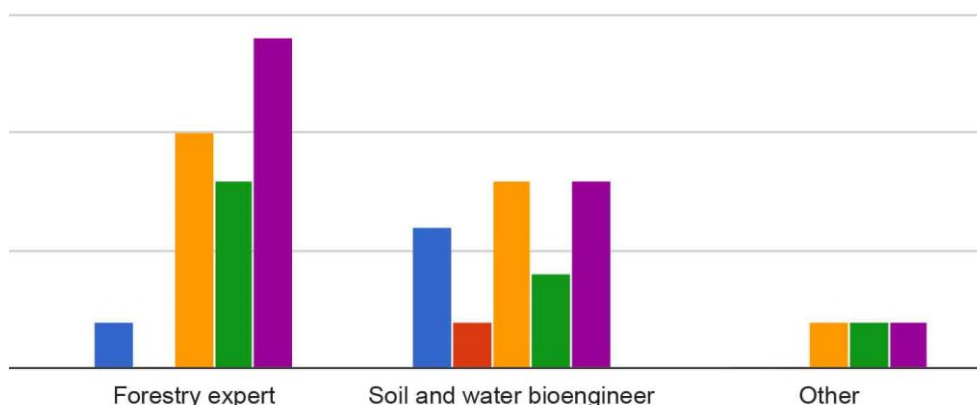
/

26. Do you usually supervise your works?

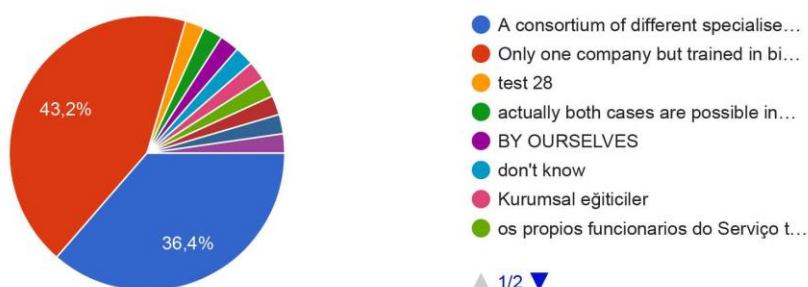


27. If NOT, what qualification had the supervisor?

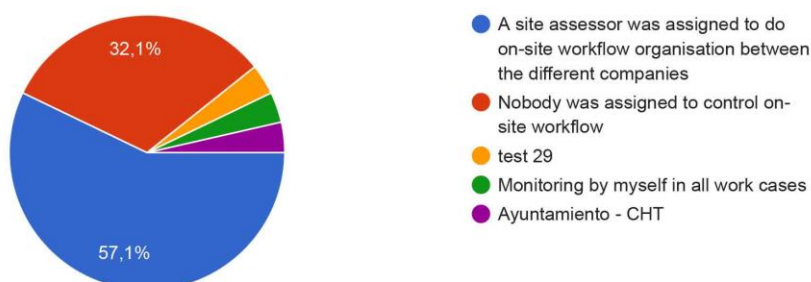




28. The construction stage was carried out by:



29. If the construction stage was realized by a consortium of different specialised companies



30. According to your experience, which are the most common errors/issues you have identified during the construction stage?

Company level: less training in vegetation knowledge; less experience and confidence to bioengineering techniques; less experience in fluvial works relating to aquatic environment work conditions; usually basic workforces have very less or no training in bioengineering techniques

Misunderstanding of the dormancy period of the live material, misunderstanding of the planting window, stock handling i.e. leaving cuttings in the sun etc..

bad quality plants

You must take into account the adaptations between the project and the real work and the success of the techniques depends in many cases on details not described

Not using the appropriate type and appropriate seed bed

unawareness of hydrological balance

Necessity to modify the projects during the construction, due to badly conceived projects in design stage. Bad understanding of the stakes.

Planting out of the designated period

Lack of knowledge by the workers in applying a correct method of construction

travaux réalisé à la mauvaise période pour la croissance des boutures

1. not considering the living material 2. ecological aspects

SELECTION OF SUITABLE METHODS AND PLANT MATERIALS AND DETAILED SURVEY

erroneous planting, leading to the plants' death

- Période d'intervention pas appropriée,
- Evaluation sommaire des contraintes chantiers lors des études de conception (APD pour DCE)
- Durabilité après construction de certaines fournitures (géotextile, géogrid, bois d'oeuvre..)
- Pas de suivi ou d'entretien des constructions après la garantie contractuelle de l'entreprise

Periodo climatico (evitare le stagioni aride)

Kullanılacak tesislerin yerinin doğru belirlenmesi...Tesisin uygun olması

Use fewer quantities than projects, to reduce cost

A falta de mão de obra qualificada, a selecção e preparação do material lenhoso para construção.

live material storage and mistakes with wood constructions

Timing of construction

site preparation and preliminary slope stabilization

quelquefois des remblais de qualités médiocres

Care of plant material

not involving the needs of local communities

WRONG MATERIALS ,WRONG DESIGN

not good planning to face field problems

La burocracia administrativa.

Burocracia administrativa

Respetar el tiempo de parada vegetativa que a menudo no concuerda con el momento que el cliente quiere que se haga la obra

application of not appropriate plants for the particular site conditions

- Lack of justification of the applied techniques
- Design not adequately fed by feasibility studies
- Lack of adequate maintenance works

PLEASE DESCRIBE THE KEY ASPECTS WHICH YOU FEEL SHOULD BE ENHANCED DURING THE CONSTRUCTION STAGE IN ORDER TO IMPROVE THE SUSTAINABILITY PERFORMANCE OF BIOENGINEERING WORKS

QUESTION

Customer level: Our monitoring worktime during the construction stage is so far too little considered in SWB work contracts.
 SWB level: As designer, project manager and surveyor I would say this is increasing importantly the risk to fail my project work.
 Company level: Qualification of company owners and his workforce needs to be enhanced; smart companys (often with good practice in "light" bioengineering) are unable to work for "heavy" or "mixed techniques" bioengineering projects because they don't have sufficient qualification in earthwork engineering (no machines, no insurance protection...)

Scheduling timing of the construction around the planting of live cuttings i.e. during the dormancy period

Take into account the access and movement of the machines, the removal of the soil layer and its proper conservation to prevent the occurrence of weeds, the control of exotic, the use of indigenous pioneer species from areas close to the site, Noise minimization and adoption of measures for wildlife

Extreme meteorological events should be considered

1. Bioengineering works are frequently included in big civil engineering projects in France, due to financial stakes. We must manage bioengineering works in special projects.
2. We need sharing of experience between workers and designers of all the mediterranean countries concerned by bioengineering problems.

Constructors not always are involved with bioengineering techniques

All works should be followed up by a specialized technician

environmental issues and sustainability and also climatic data

planting

Bonne identification des contraintes du chantier en phase étude, étude géotechnique, hydrogéologique, hydro-morphologique, floristique, faunistique.,
 choix judicieux des matériaux, végétaux, dimensionnement des ouvrages ...
 Financement des études et du chantier en phase avec les objectifs à atteindre surtout si la durabilité est le critère premier.

Conoscenza da parte dei progettisti

Supervise always

A localização e classificação dos materiais de construção na obra

Few trained companies in bioengineering works and engineers supervising with few or no experience

Work on the banks prior to planting

A clear view of the main purpose of the intervention including all the external factors and a perfect idea of the impact of the intervention in the future and the need to maintained and monitored

A better attention to the plant mterial constraints

resilience

RIGHT MATERIALS

Better plans based on more enviromental data and field measurements

Poner de acuerdo a las diferentes administraciones que tienen poder para llevara a cabo proyectos en las riberas del río Tajo y Jarama a su paso por Aranjuez: Ayuntamiento, CHT, CAM, Patrimonio Nacional y, además, implicar a las asociaciones ecologistas y la ciudadanía.

Material nativo y procedente cerca del lugar de las obras // Personal cualificado en trabajos de bioingeniería o con experiencia en este tipo de trabajos // respetar la parada biológica // mantenimiento de los trabajos durante al menos dos años.

- Better training of the designers and constructors
- Clearer and larger interaction between scientists, practitioners and managers
- Adaptive management by means of continuous monitoring

11. ANNEX 4: THE MONITORING STAGE QUESTIONNAIRE

11.1 The Monitoring QUESTIONS

3. MONITORING AND MAINTENANCE STAGE

The following questions seek to establish the strength of your views in relation to the following statements. A scale is presented from 1 (low) and 5 (high). There are also some questions following a simply yes or no format, and some descriptive text boxes.

About the PERSONAL CODE:

The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname

*** Compulsory Field**

1. My Personal Code (4 letters/numbers) *

2. Name

3. Age *

4. Gender *

- ☐ Male
- ☐ Female

1. What do you associate with the term "soil and water bioengineering works monitoring"?

2. Which assessment instrument did you use to monitor a soil and water bioengineering work?

- ☐ Assessment form
- ☐ Data recording
- ☐ None
- ☐ Other _____

3. Do specific regulations for soil and water bioengineering works monitoring exist in your country ?

- ☐ YES
- ☐ NO
- ☐ I don't know

4. If YES, please detail here

5. Have you heard about EFIB'S "European Guidelines of Soil and Water Bioengineering" and its monitoring recommendations?

☐ YES

☐ NO

6. Before planning, have you ever carried out a monitoring activity relating to greenery of the site, in order to choose the correct arboreal species to plant?

☐ YES

☐ Only sometimes

☐ NO

7. In your soil and water bioengineering projects did you ever consider any budget for the monitoring works?

☐ Always

☐ Frequently but not always

☐ Only sometimes

☐ NO

8. Was the monitoring process written in a simple and understandable way in your soil and water bioengineering projects?

☐ Always

☐ Frequently but not always

☐ NO

9. In your soil and water bioengineering projects, would you describe the implementation of the monitoring process as easy?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ NO

10. In your completed soil and water bioengineering projects had you planned for the long term-monitoring of the works?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ NO

11a. If YES, for how many years?

11b. If No, why not?

12. Did the monitoring process make you critically reflect on some of your planning decision?

- ☐ YES
- ☐ Only Sometimes
- ☐ NO

13. if yes, which were the maior iusses identified?

14. Did you use a monitoring workflow task sheet to fill in during the monitoring process?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only sometimes
- ☐ NO

15. Were the monitoring activities contracted to the same building company that constructed the soil and water bioengineering works?

- ☐ YES
- ☐ Only some
- ☐ NO

16. If no, who executed the monitoring activities instead of them?

MAINTENANCE

17. Do specific regulations about the maintenance of soil and water bioengineering works exist in your country?

- ☐ YES
- ☐ NO
- ☐ I don't know

18. If YES, which one is it ?

19. Do you think the soil and water bioengineering works you were involved with in the past would have benefited from planned maintenance?

- ☐ YES
- ☐ Not all works
- ☐ NO

20. Do you think there is a gap between what you planned and the actual performance/growth of plants in previous soil and water bioengineering works?

- ☐ Always
- ☐ Frequently but not always
- ☐ Only in some work
- ☐ Not at all

21. Do you think that there is a gap between what you expected and the actual performance of plants in the slope or river bank stabilisation works you have been involved with?

- ☐ Always
- ☐ Frequently but not in all works
- ☐ Only in some work
- ☐ NOT at all

22. If YES please describe what you expected

23. If YES please describe the actual performance

24. Were the maintenance works contracted to the same building company which constructed the soil and water bioengineering works?

- ☐ YES
- ☐ NO
- ☐ No maintenance contracted

25. According to your experience, was the maintenance of the work important for the overall success of the intervention?

1 Low..... 5 High

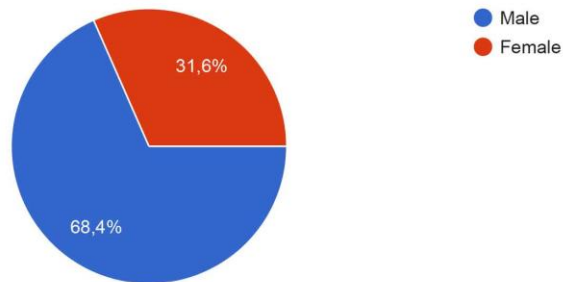
1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PLEASE DESCRIBE YOUR PROPOSED SPECIFIC CHANGES, NEEDS OR NEW APPROACHES FOR THE MAINTENANCE AND MONITORING STAGE OF SOIL AND WATER BIOENGINEERING WORKS

11.2 The Monitoring ANSWERS

Gender

100%



1. What do you associate with the term "soil and water bioengineering works monitoring"?

100%

To control de efficiency of the living materials, the inert structures and the efectivness in technical , ecological, landscape and socioeconomical functions

May be 'enviroment'.

flooding, soil erosion, land slide, exessive precipitation

To control the evolution of the bioengineering works

I ve been doing research on soil and erosion.

It is my research subject and

SUCCESS OF BIOENGINEERING WORK

slopes stabilization

Controllo dello stato vegetativo

Proje yapım aşamasında ve gerçekleşmesinde varım.

Avaliação periodica das componente vegetal e estrutural da obra.

Monitoring the improvement or failure the work.

monitoring plants development, quality after construction, etc

Bank stabilization

evaluate the effectiveness of the intervention, plant success and soil stabilization, biodiversity and landscape impact

Qualità delle acque, Stato del suolo, Dissesto idrogeologico,.

Monitoring of all necessary activities for soil protection and water flow prevention

je ne suis pas informé sur cette surveillance

forest engineering

protective measures based on environmentally friendly methods

ΔΕΝ ΞΕΡΩ

Dar seguimiento a una obra de restauración de ribera

Supervisión de las obras desde su ejecución hasta su evolución posterior

Restauración hidrológica y estabilización de márgenes de ríos

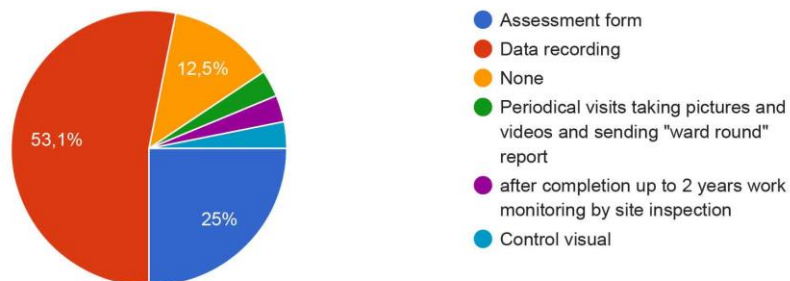
Los trabajos de mantenimiento una vez acabadas las obras de bioingeniería

Watch and visit periodically soil and water bioengineering works

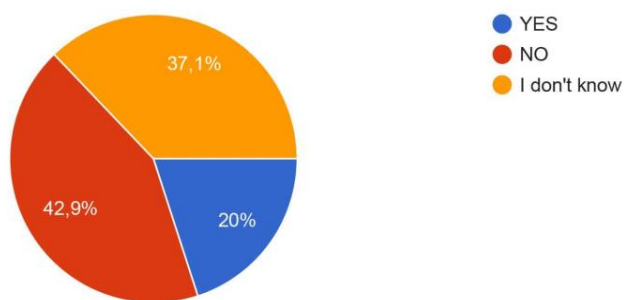
Periodic measurement of specific metrics or indicators which allow determining the success of the works fulfilled, under particular protocols or procedures

2. Which assessment instrument did you use to monitor a soil and water bioengineering work?

Figure 2.1



3. Do specific regulations for soil and water bioengineering works monitoring exist in your country ?



4. If YES, please detail here

1 2 3 4 5

Landscaping works and his fascicule n°35

watersehed protection regulations, road site treatment regulations

Çıkan tamimler ve yönetmelikler..1996 Milli Ağaçlandırma ve Erozyon Kontrolü Seferberliği-2013 Erozyonla Mücadele Eylem Planı- 2005 Toprak Koruma Ve Arazi Kullanımı Kanunu

C.C.T.P. fascicule n°35 « Aménagements paysagers ... »

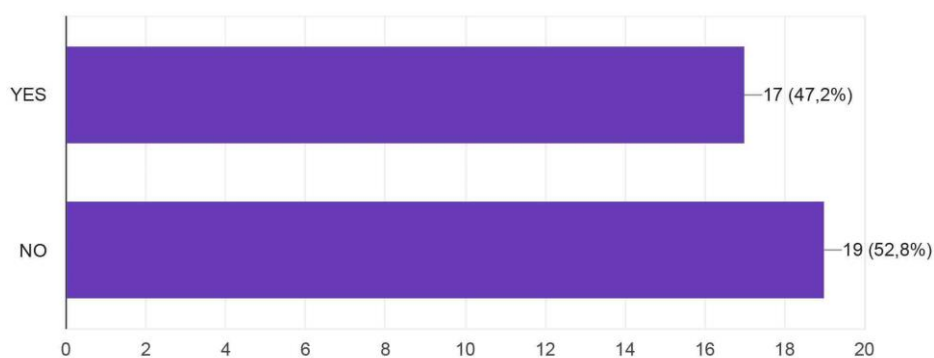
SQR monitoring system

Pero no las conozco, porque no soy ingeniera medioambiental

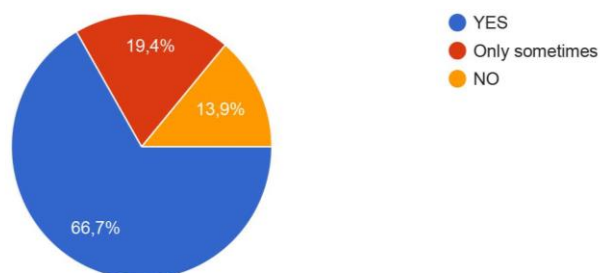
Guidelines provided by specialized associations

5. Have you heard about EFIB'S "European Guidelines of Soil and Water Bioengineering" and its monitoring recommendations?

1 2 3 4 5

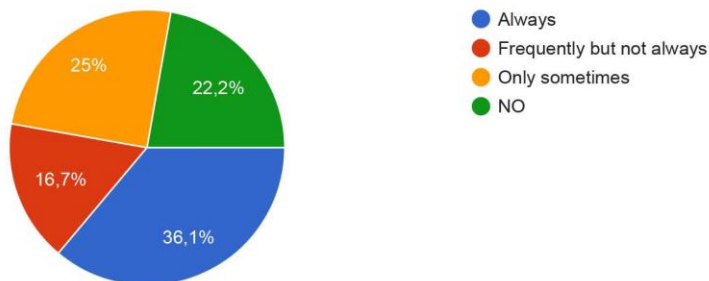


6. Before planning, have you ever carried out a monitoring activity relating to greenery of the site, in order to choose the correct arboreal species to plant?



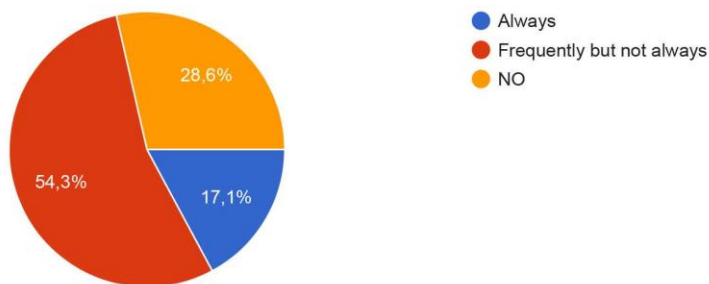
7. In your soil and water bioengineering projects did you ever consider any budget for the monitoring works?

4 100%



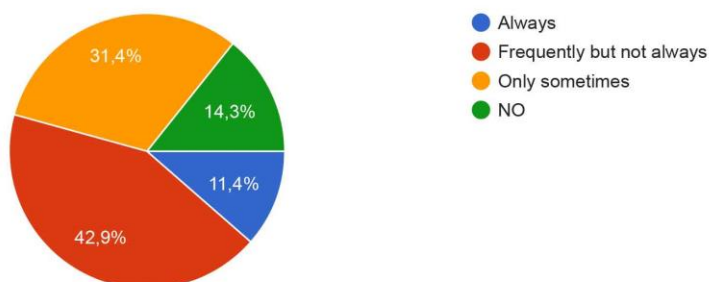
8. Was the monitoring process written in a simple and understandable way in your soil and water bioengineering projects?

4 100%



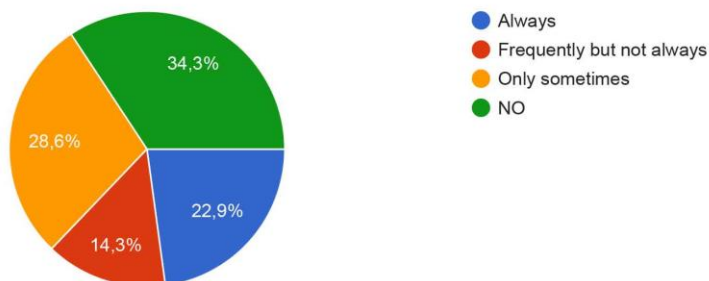
9. In your soil and water bioengineering projects, would you describe the implementation of the monitoring process as easy?

4 100%



10. In your completed soil and water bioengineering projects had you planned for the long term-monitoring of the works?

100% 100%



11a. If YES, for how many years?

100% 100%

Regular needs in France ask at most for 2 years after work completion

During the project

ten years

5

Almeno 5

5 anos

2 years

2/3 years

Almeno cinque

10

Aquí, en Aranjuez, se han comenzado proyectos, pero no se han terminado por cambios políticos en el Ayuntamiento.

20

2 años

1,5 or 2

3-8 years

11b. If No, why not?

100% 100%

Lack of Budget . Ussualy i control myself the Works during 10 or more years

There is no information on it.

It was not required. We only have to do the design of the bioengineering works during the most projects

BECAUSE THEY WERE GOVERNMENTAL WORKS AND WE DO NOT HAVE CHANCE TO HAVE BUDGET FOR MONITORING IN GOVERNMENTAL WORKS

Yapılması gerekir fakat uzun vadeli izlenmemektedir.

ΔΕΝ ΕΙΝΑΙ ΣΤΟ ΑΝΤΙΚΕΙΜΕΝΟ ΜΟΥ

More than 2 years after completion aren't usual in municipality contracts

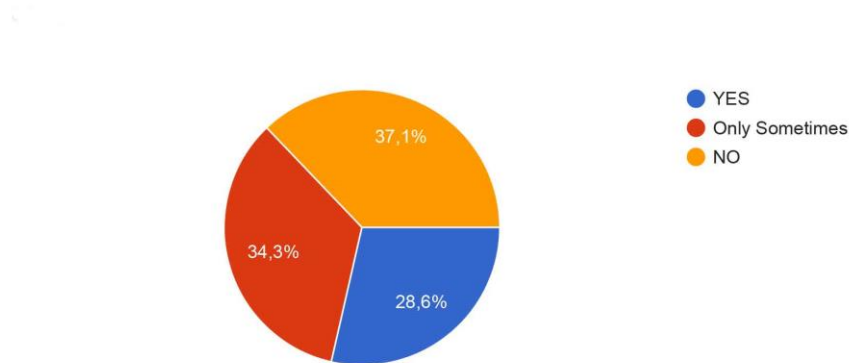
non concerné

No budget for it

Porque si cambia el alcalde, cambia los proyectos.

No más, por cuestiones económicas del cliente.

12. Did the monitoring process make you critically reflect on some of your planning decision?



13. if yes, which were the major issues identified?

1) I don't have enough time (lack of public contract terms) to do a correct monitoring on-site activity during the construction stage

2) The french 2years regular needs are too short to cover a best vegetation development

3) The customers practice is to forget the maintenance in the life stage of bioengineering works

1-The oversized Works 2- The transition between the hard and soft techniques

Lack of flexible business plan, Not anticipating certain risks in advance

Budgetary problems

Piante non adatte al clima.

A selecção de espécies, o método de plantação, tipo de técnica utilizada

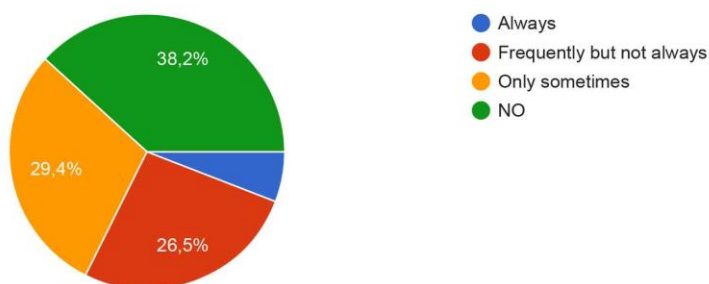
plant material, wood type used and season

No entiendo la pregunta.

vegetation development, consolidation of the wooden structures

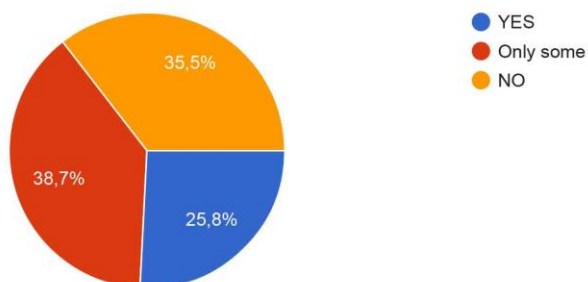
14. Did you use a monitoring workflow task sheet to fill in during the monitoring process?

100%



15. Were the monitoring activities contracted to the same building company that constructed the soil and water bioengineering works?

100%



16. If no, who executed the monitoring activities instead of them?

100%

The designer or the Project manager

A different technical staff .

MONITORING ACTIVITIES USUALLY ARE NOT CONTINUED

don't know

universities

company technical team

Qualità acque

we do , according to the Greek Law

Voluntarios.

La propiedad sociedad ejecutora.

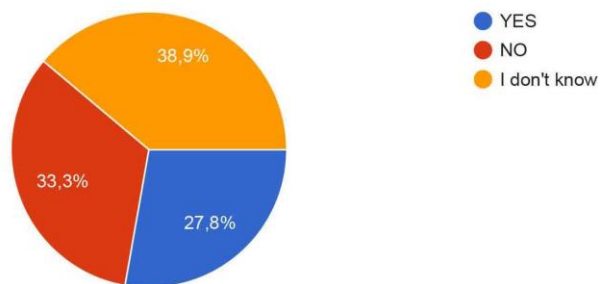
Las brigadas de mantenimiento de las infraestructuras (carreteras, ferrocarriles, etc)

ourselves

The managers of the study area

MANTEINANCE

17. Do specific regulations about the maintenance of soil and water bioengineering works exist in your country?



18. If YES, which one is it ?

Landscaping works and his fascicule n°35

the forest law,,environmental law,land law...

Soil protection law and erosion control general direction

common contract regulations of govermental works

SOIL LAW, RANGELAND LAW

5403 sayılı toprak koruma ve arazi kullanımı kanunu

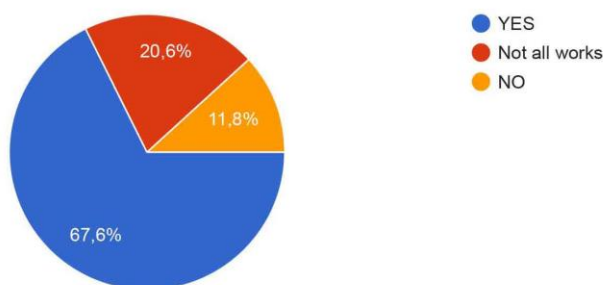
Some damaged structures will be repaired

C.C.T.P. fascicule n°35 « Aménagements paysagers ... »

Pero las desconozco.

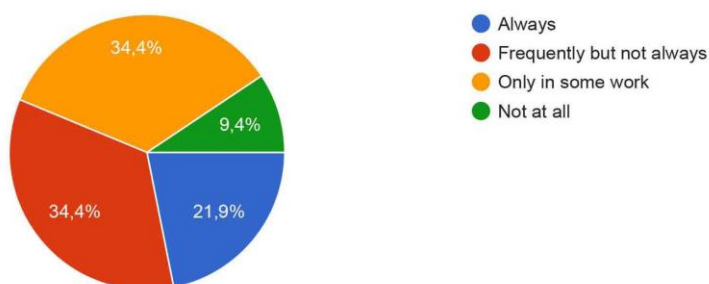
19. Do you think the soil and water bioengineering works you were involved with in the past would have benefited from planned maintenance?

8/17/2020

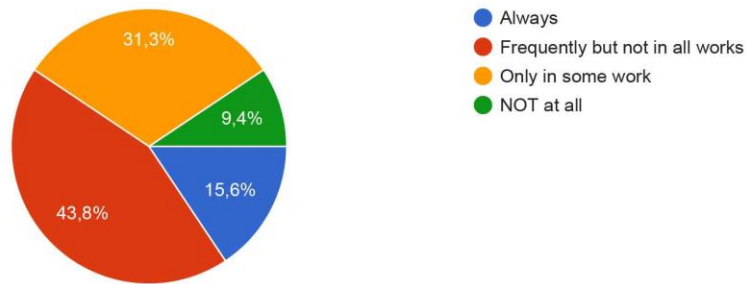


20. Do you think there is a gap between what you planned and the actual performance/growth of plants in previous soil and water bioengineering works?

8/17/2020



21. Do you think that there is a gap between what you expected and the actual performance of plants in the slope or river bank stabilisation works you have been involved with?



22. If YES please describe what you expected

Answers:

Knowledge of best root growth along "anchor live cuttings" and living branches needs to be enhanced (interaction of soil, species, compaction, pore space...)

To cover the land with vegetation in short time at sloping places

top level of maintenance

VARIATION IN CLIMATIC CONDITIONS CAN AFFECT OUR SUCCESS

Esperava a germinação homogênea das espécies seleccionadas na hidrosementeira

plant quality, soil fertility and water availability

You can never predict nature accurately

La recuperación de las riberas de los ríos Tajo y Jarama, a su paso por Aranjuez

23. If YES please describe the actual performance

Answers:

Mostly best root anchoring and growth but only in reduced stabilization depth

Not reaching the target rate of plant coverings in some areas.

low growing

Grandes diferencias nos períodos de germinação das espécies seleccionadas para sementeira e por tanto desigual cobertura do terreno.

Mediterranean climate with extreme events like torrential precipitation don't allow a normal plant to stabilize and grow

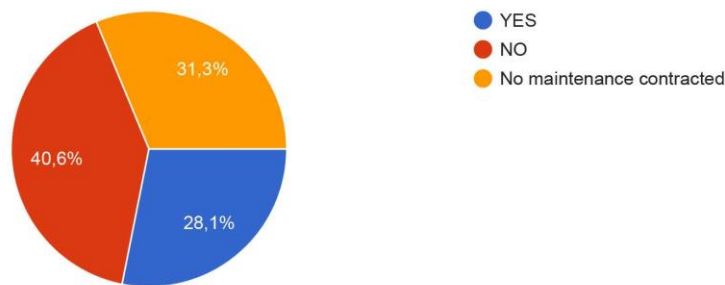
good landscape integration; high performance in soil stabilization during 1 up to 2 decades even when maintenance is irregular or absent; more than 2 decades : soil stability decreasing when absent

It depends on climatic conditions

Se ha realizado parcialmente y mal, porque no hay mantenimiento.

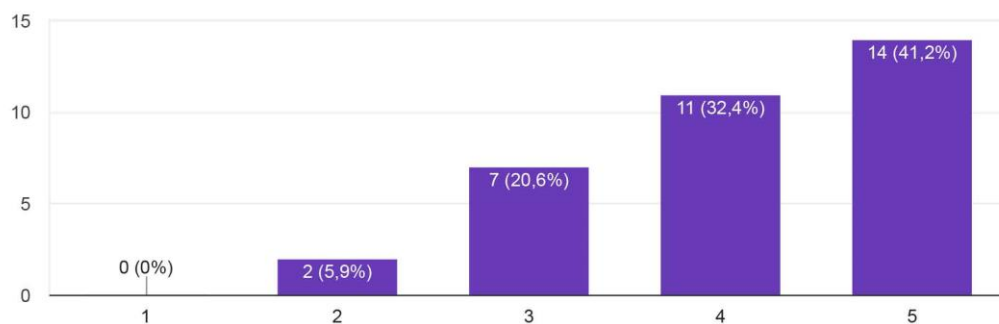
24. Were the maintenance works contracted to the same building company which constructed the soil and water bioengineering works?

Figure 24



25. According to your experience, was the maintenance of the work important for the overall success of the intervention?

Figure 25



PLEASE DESCRIBE YOUR PROPOSED SPECIFIC CHANGES, NEEDS OR NEW APPROACHES FOR THE MAINTENANCE AND MONITORING STAGE OF SOIL AND WATER BIOENGINEERING WORKS

1)

- 1) Customer level: Provide more funding for SWB engineers to have good monitoring activity during construction stage and life stage
- 2) idem for the SWB's 'life stage' monitoring activity: increasing the regularity limit from 2 to at least 5 years after completion
- 3) Europa: Provide funding for research of rootanchoring behavior during deep slope/river bank construction stage and life stage monitoring
- 4) French authorities: updating the regulary fascicule n°35 to the latest monitoring experiences and observations in Europe is required
- 5)

The Warranty of the work must include maintenance and should last at least three years after conclusion, instead of one year duration.

Nothing

maintenance contracted

Foi necessária o arranque de espécies invasoras duas vezes, uma no final da primavera, a segunda no final do verão. Devido a presença de espécies herbáceas invasoras, neste período viu-se reforçada a intensidade de visitas a campo para efectuar a monitorização.

Restore the lost plants

the most of my roughly 40 works didn't have neither regular nor professional long term maintenance. This absence implies, in case of fluvial works, a decrease of soil stability due to old non vigoureux tree stratum. My proposal is to integrate "as obliged" long term monitoring in public bioengineering work contracts

need justifications and automatisations for machinery work

synchronization desing construction

Development of protocols for maintenance and making mandatory

Reunirse con las autoridades competentes: Ayto., CAM, CHT y Patrimonio Nacional.

En relación a este aspecto es necesario concienciar a las administraciones que son quienes verdaderamente tienen el poder de contratar el mantenimiento de las obras realizadas. en los proyectos siempre están contempladas, pero lo cierto es que el periodo de garantía no se cumple por parte de las constructoras porque no hay una remuneración económica una vez acabadas las obras.

Specific regulations about the monitoring and maintenance of soil and water bioengineering works are needed

12. ANNEX 5: THE TRAINING STAGE QUESTIONNAIRE

12.1 The Training QUESTIONS

4. TRAINING AND EDUCATIONAL STAGE

Please evaluate the statements below from 1-5 taking into consideration your expectations (lower value 1 higher value 5), or answer YES or NO .

About the PERSONAL CODE:

The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname

*** Compulsory Field**

Email address *

My Personal Code (4 letters/numbers) *

Name

Age *

Gender *

☐ Male

☐ Female

1) RESPONDENT'S COUNTRY *

- ☐ France
- ☐ FYROM
- ☐ Greece
- ☐ Great Britain
- ☐ Italy
- ☐ Portugal
- ☐ Spain
- ☐ Turkey
- ☐ Other _____

2) Which is your GROUP? *

- ☐ Student
- ☐ Stakeholder (From Companies, Enterprises, etc)
- ☐ Academic
- ☐ Soil and Water Bioengineering Consulting Agency
- ☐ Other _____

3) Can you please indicate the level of your education?

- ☐ Undergraduate
- ☐ Graduate
- ☐ Postgraduate

4) If undergraduate:

- ☐ Level 1
- ☐ Level 2
- ☐ Level 3
- ☐ Level 4 (if relevant)

5) If graduate:

- ☐ Graduate in 3 years
- ☐ Graduate in 4 years
- ☐ Graduate in 5 years

6) If Post graduate:

- ☐ Master
- ☐ Other _____

7) In case you are a student, which is your current position?

- ☐ Undergraduate student (BSc, BEng, BA etc)
- ☐ Master Student (MSc, MA, MEng, etc)
- ☐ Post-graduation Course Student
- ☐ PhD Candidate
- ☐ Other _____

8) If you are a student, please indicate the name of the course in which you are currently enrolled. (e.g. name of Master Course, PhD School, etc.)

9) If you are a student, please indicate the name of the institution delivering the Course in which you are currently enrolled.

10) In case you are a student select the Country where you are currently attending the Course.

- ☐ France
- ☐ Greece
- ☐ Great Britain
- ☐ Italy
- ☐ Portugal
- ☐ Republic of Macedonia (FYROM)
- ☐ Spain
- ☐ Turkey
- ☐ Other _____

11) If you are employed, who is your employer?

- ☐ Local authority/Government agency
- ☐ Public body/utility
- ☐ Private organisation (large)
- ☐ Private organisation (small)
- ☐ Higher education
- ☐ Professional
- ☐ Other _____

12) I have worked in the soil and water bioengineering sector for:

- ☐ Less than 5 years
- ☐ 5 to 20 years
- ☐ More than 20 years

13) How useful do you think a Training course in Soil and water bioengineering would be?

1 low....5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14) Would it be possible for you to follow it?

- ☐ YES
- ☐ NO
- ☐ Not concerned

15) How useful do you think a Master level degree would be in soil and water bioengineering?

1 low....5 high

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16) Do you think you have sufficient knowledge to be able to successfully complete Masters level degree in this field?

- ☐ YES
- ☐ NO
- ☐ Not concerned

17) To what extent do you think such a programme would be beneficial to you/employer/sponsor if it was provided on-line (distance learning)?

1 low....5 high

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18) According to the informations you have about the soil and water bioengineering, and considering its importance in the area in which you work/study, do you think this training course/master would be enhancing your employability?

1 Low....5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19) In your studies, have you attended any of the following courses? *

1 lower value.....5 max value

	Yes	No
Byotechnique-plant science	<input type="checkbox"/>	<input type="checkbox"/>
Ethology	<input type="checkbox"/>	<input type="checkbox"/>
Pedology	<input type="checkbox"/>	<input type="checkbox"/>
Geology	<input type="checkbox"/>	<input type="checkbox"/>
Geotechnique - geotechnical engineering	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulics	<input type="checkbox"/>	<input type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input type="checkbox"/>
Material technology	<input type="checkbox"/>	<input type="checkbox"/>
Planning	<input type="checkbox"/>	<input type="checkbox"/>
Topography	<input type="checkbox"/>	<input type="checkbox"/>
Technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
GIS	<input type="checkbox"/>	<input type="checkbox"/>
Landscape architecture	<input type="checkbox"/>	<input type="checkbox"/>
Ecosystem biology	<input type="checkbox"/>	<input type="checkbox"/>
Hydrobiology	<input type="checkbox"/>	<input type="checkbox"/>

20) Among the technical subject you studied, which one was the most useful for your professional work? *

1 Low.....5 High

	1	2	3	4	5
Byotechnique-plant science	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pedology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geotechnique - geotechnical engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Material technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Topography	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical drawing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GIS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landscape architecture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ecosystem biology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydrobiology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21) Which were the technical subjects you had lack more ? *

1 lower value....5 max value

	1	2	3	4	5
Byotecnique-plant science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pedology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geotechnique - geotechnical engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydraulics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Material technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Topography	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical drawing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape architecture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ecosystem biology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrobiology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22) According to your professional experience, do you think there are some other subjects which would be useful to develop your knowledge of soil and water bioengineering ?

☐ YES

☐ NO

☐ Other: _____

23) If YES, which one?

24) To what extent do you think there is a shortage of professionals trained in the subject of soil and water bioengineering in Europe?

1 low5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

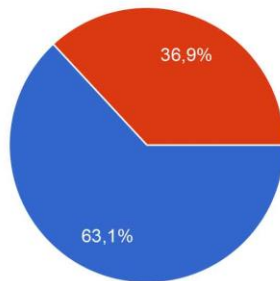
25) Regarding the soil and water bioengineering, in your opinion, what are the main training gaps for employees who start working in public or private administration?

PLEASE DESCRIBE YOUR PROPOSED SPECIFIC CHANGES, NEEDS OR NEW APPROACHES FOR TRAINING IN SOIL AND WATER BIOENGINEERING WORKS

12.1 The Training ANSWERS

Gender

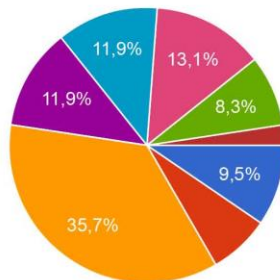
60% 40%



Male
Female

1) RESPONDENT'S COUNTRY

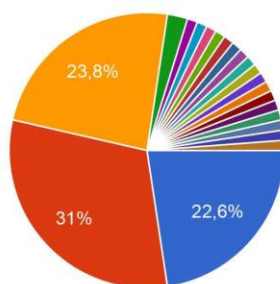
60% 40%



France
FYROM
Greece
Great Britain
Italy
Portugal
Spain
Turkey
Canada

2) Which is your GROUP?

60% 40%

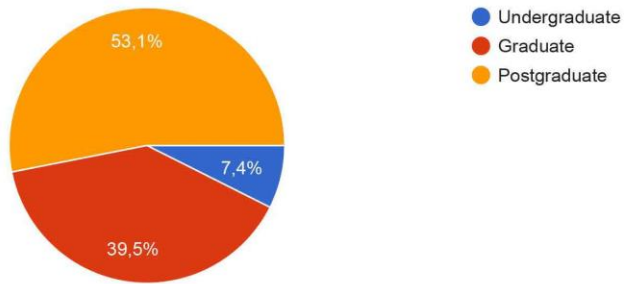


Student
Stakeholder (From Companies, Ent...
Academic
Soil and Water Bioengineering Con...
FOREST MANAGMENT
Researcher
civil engineering
geologo

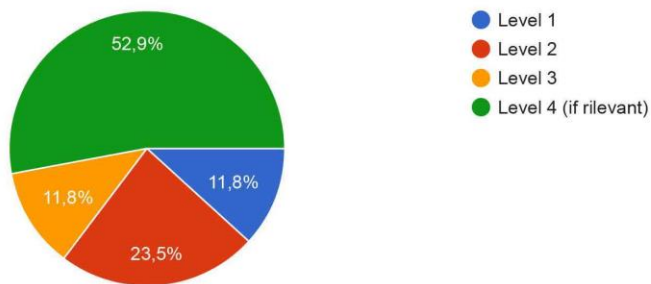
1/3

3) Can you please indicate the level of your education?

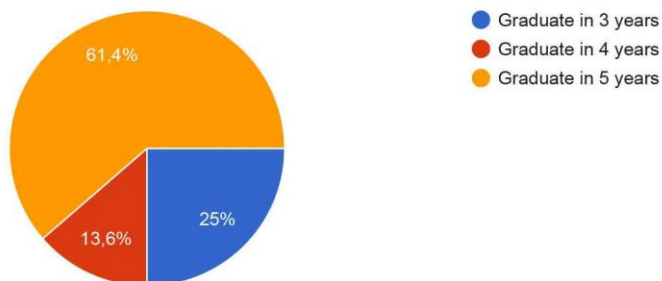
60% 40%



4) If undergraduate:

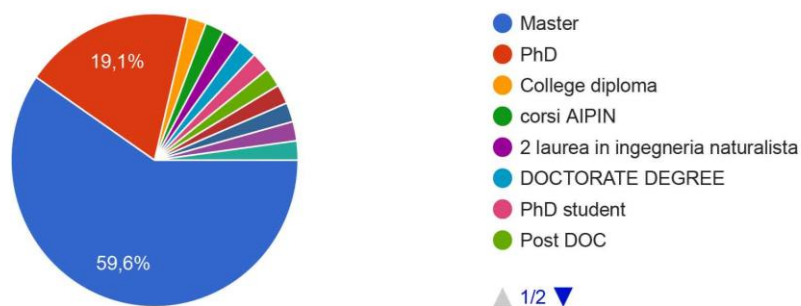


5) If graduate:



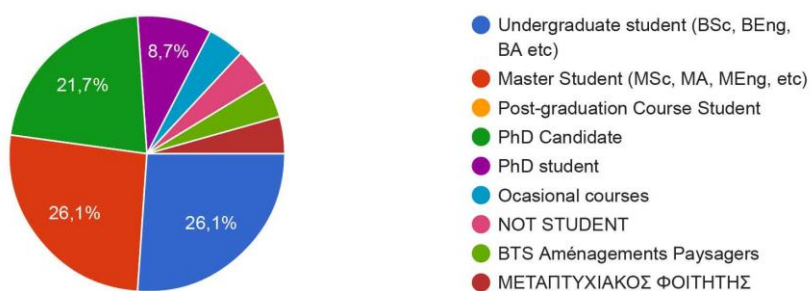
6) If Post graduate:

Figure 6



7) In case you are a student, which is your current position?

Figure 7



9) If you are a student, please indicate the name of the institution delivering the Course in which you are currently enrolled.

100%

Universidade de Évora

Istanbul University, Institute of Sciences

Federal University of Santa Maria

TEIAMΘ

Université Laval

Eastern Macedonia and Thrace Institute of Technology

Newcastle University

TEI AMΘ

TECHNOLOGICAL INSTITUTE OF KAVALA- GREECE

Fonlabour

TEI ATHENS

UNIVERSIDAD POLITECNICA DE MADRID

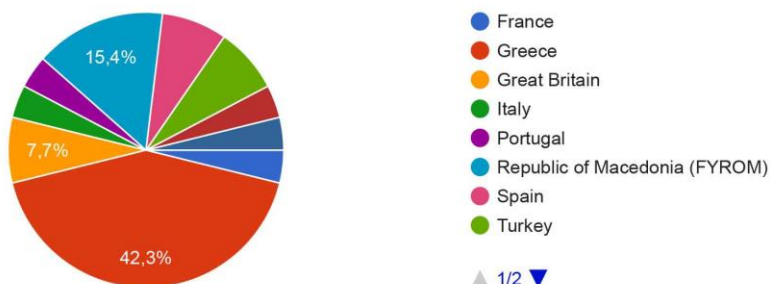
Faculty of Civil Engineering, Ss. Cyril and Methodius University 1000 Skopje, Macedonia

Saints Cyril and Methodius University of Skopje

Civil Engineering Faculty, University of Cyril and Methodius Skopje

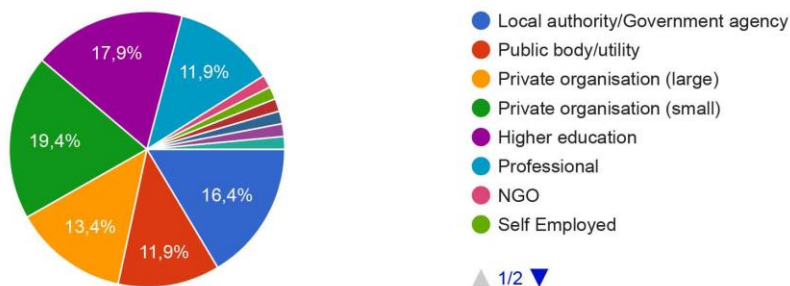
10) In case you are a student select the Country where you are currently attending the Course.

100%



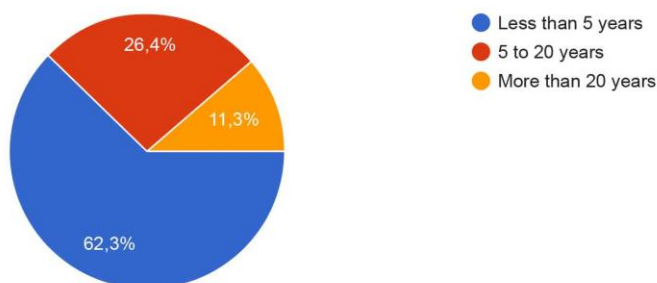
11) If you are employed, who is your employer?

100%



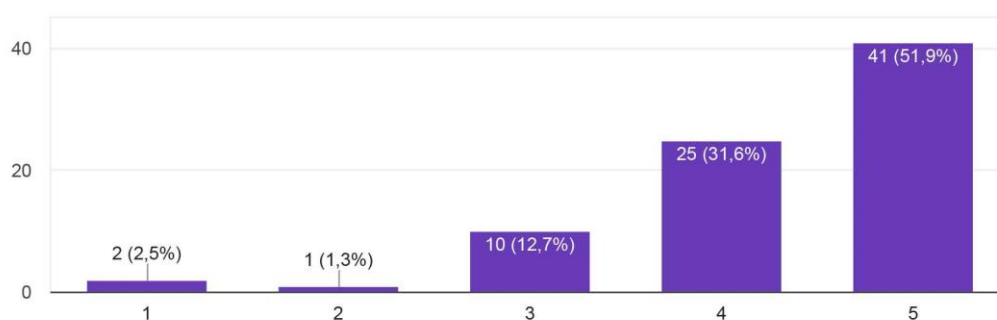
12) I have worked in the soil and water bioengineering sector for:

100%



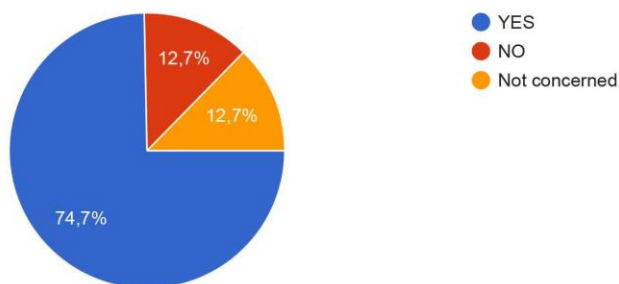
13) How useful do you think a Training course in Soil and water bioengineering would be?

100%



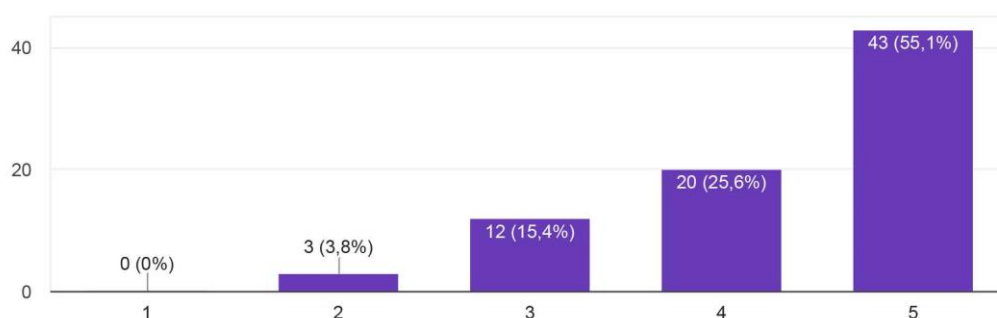
14) Would it be possible for you to follow it?

100%



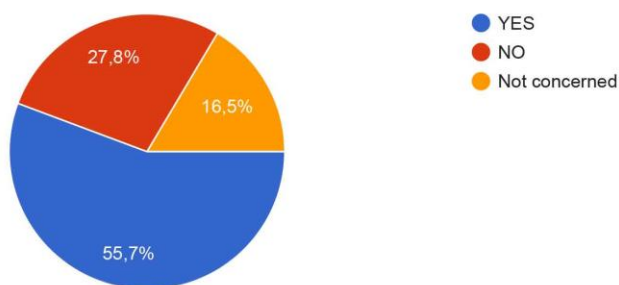
15) How useful do you think a Master level degree would be in soil and water bioengineering?

100% 100%



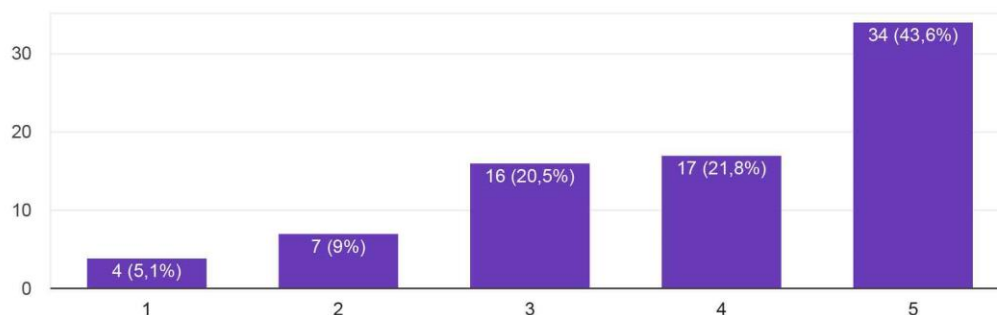
16) Do you think you have sufficient knowledge to be able to successfully complete Masters level degree in this field?

100% 100%



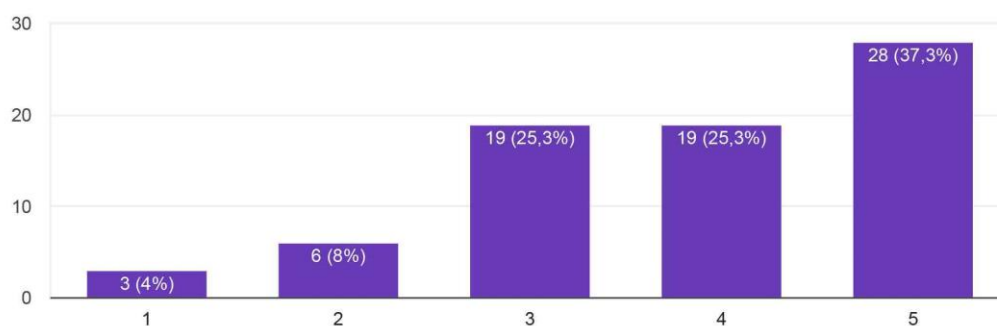
17) To what extent do you think such a programme would be beneficial to you/employer/sponsor if it was provided on-line (distance learning)?

100% 100%

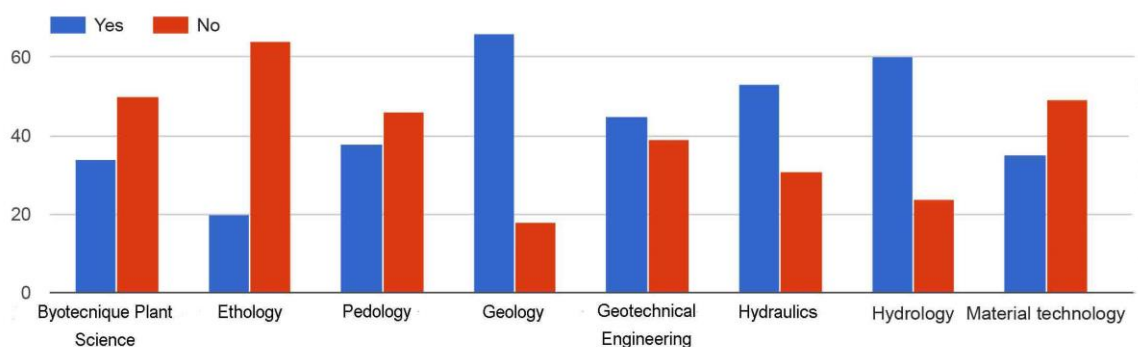


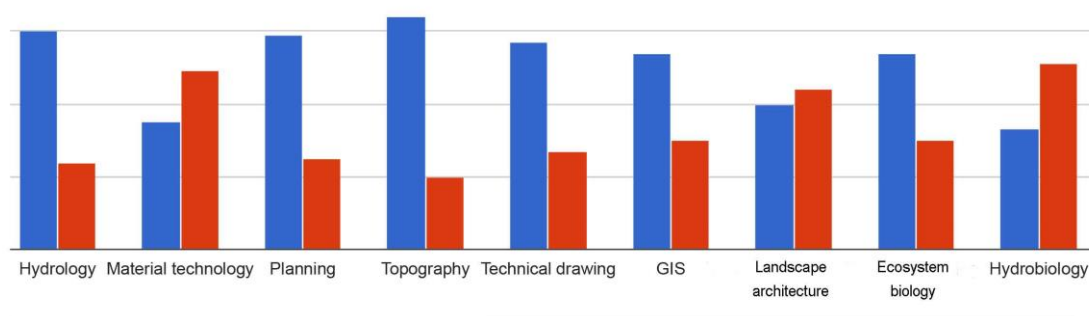
18) According to the informations you have about the soil and water bioengineering, and considering its importance in the area in which you work/study, do you think this training course/master would be enhancing your employability?

Figure 3-7

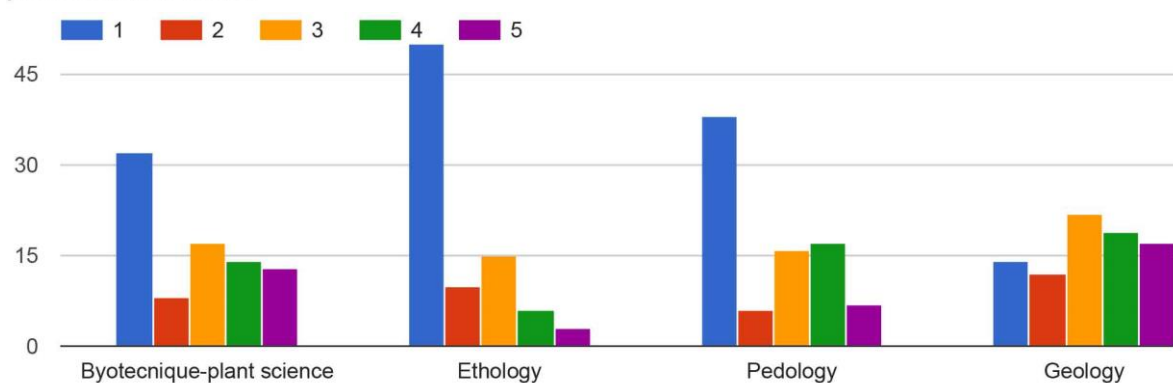


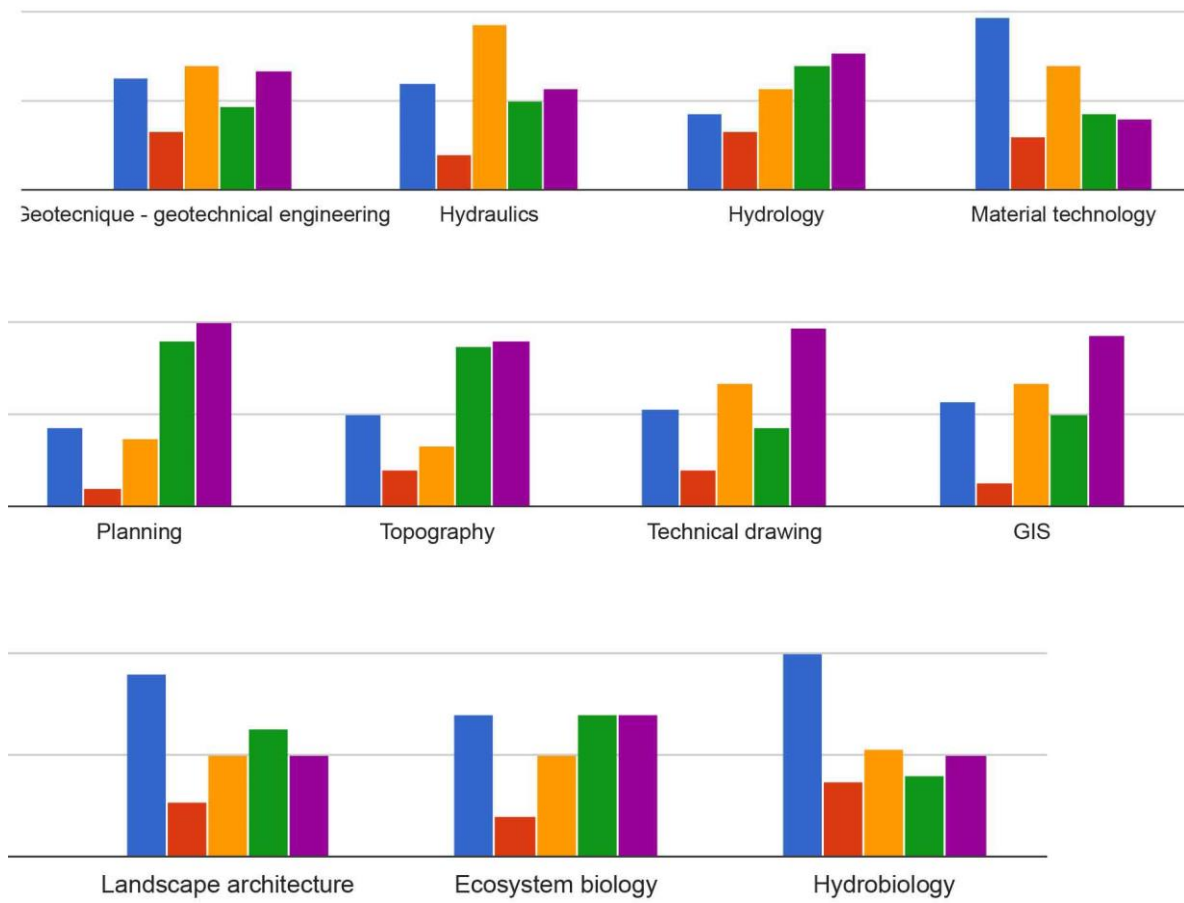
19) In your studies, have you attended any of the following courses?



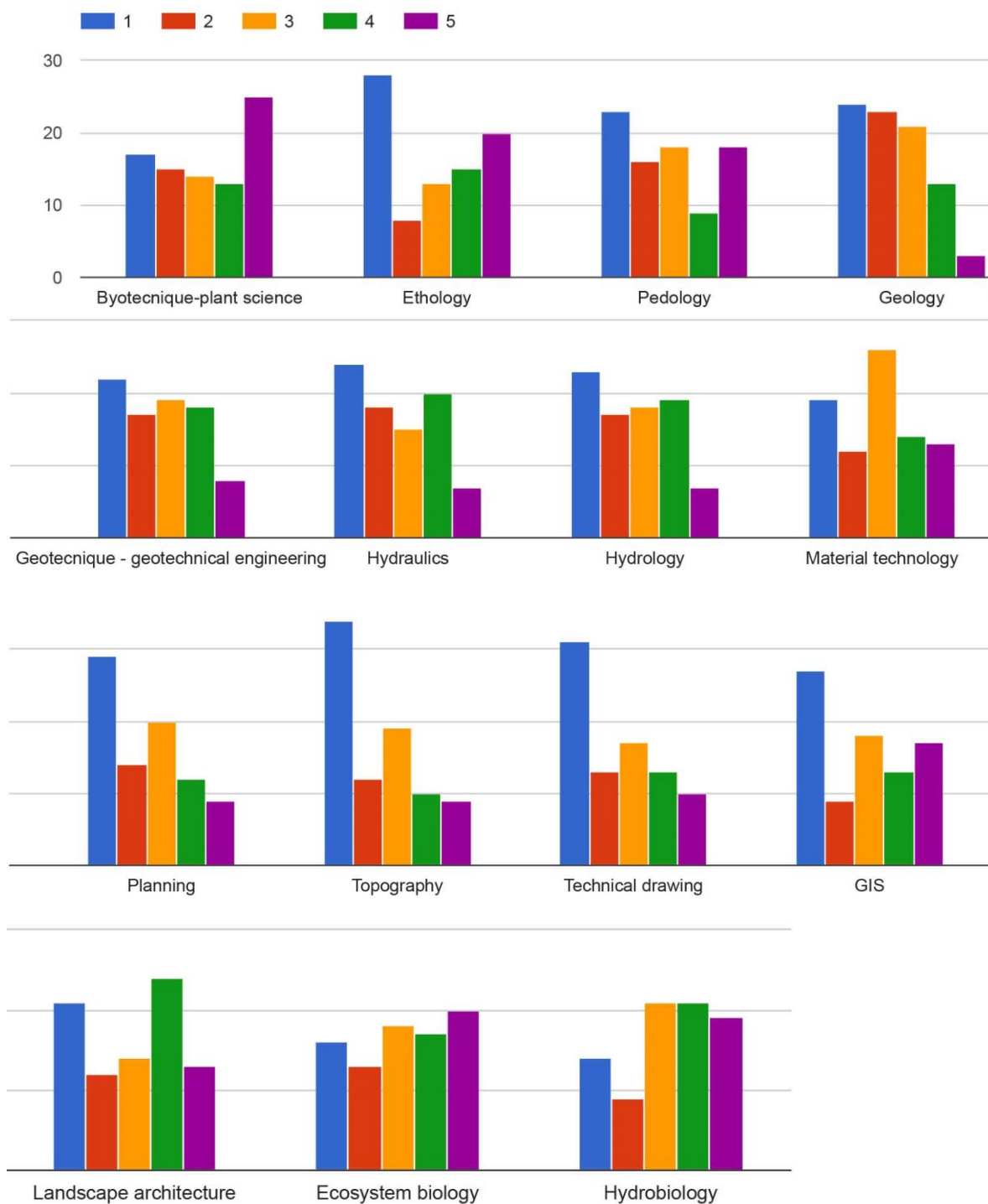


20) Among the technical subject you studied, which one was the most useful for your professional work?



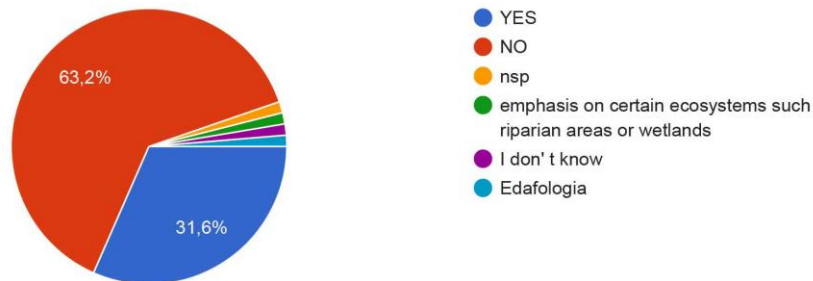


21) Which were the technical subjects you had lack more ?



22) According to your professional experience, do you think there are some other subjects which would be useful to develop your knowledge of soil and water bioengineering ?

Figure 10



23) If YES, which one?

surveying, learning about utilization of low impact equipment and approaches to preserve existing vegetation and forest floor.

River and geotechnical modelisation, Green Infrastructure planification

experience

Civil Engineering and Geology

Disturbance ecology

Botanics

Agronomia

ECOSYSTEM MANAGEMENT AND plant disease

Hidroloji

soil-plant-and water relations

Structural Engineering

A utilização de materiais novos de rápida montagem para estabilização de margens de ribeiras

HYDROLOGY - UNDERGROUND DROUGHT

Topography

la stabilisation de berge qui possèdent des arivées d'eaux profondes (plus basse que le lit de la rivière)

riparian areas and wetlands ecosystems

ecotoxicology

hydrogeology

Edafologia

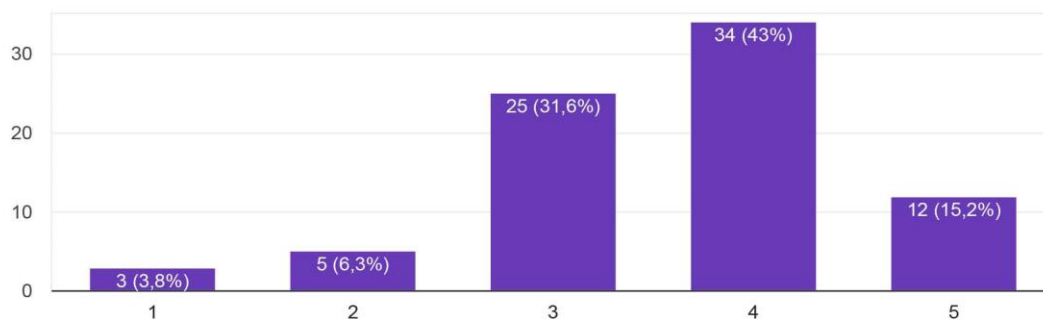
Cálculos estructurales

research for new species useful in soil bioengineering, especially on mediterranean environment

Training support on the development of practical case studies

24) To what extent do you think there is a shortage of professionals trained in the subject of soil and water bioengineering in Europe?

79 risposte



25) Regarding the soil and water bioengineering, in your opinion, what are the main training gaps for employees who start working in public or private administration?

It has to be combined with other specialization such as civil engineering, or landscape architecture etc..

The lack of certificated courses, the lack of a database of projects and good practices,...

unknown profession

Personnel of Government and Private Sector should be trained on the job.

Lack of knowledge in fundamental sciences

lack informations

Tutto

There is no specific program particularly related with bioengineering works

Plant breeding

application of knowledge

I think the main cause of soil and water bioengineering not to be applied in local authority is the lack of political will.

Cultura della bioingegneria

Bu konuda eğitimden direk projenin içine girip uygulayabilmekteler.

Knowledge about the advantages of the solutions.

Practical experience and design experience

Manage working with diverse groups

THE COMBINATION OF THESE (SOIL & BIOENGINEERING)

lack of knowledge about the advantages and the multi functionality of the intervention, more case study's in the Mediterranean country's

GIS

Awareness of new development in research

i do not know

Conoscenze tecniche di base, applicazioni nel campo

Model knowledge and application

13. ANNEX 6: THE COMPANY/ENTERPRISES STAGE QUESTIONNAIRE

13.1 The Company QUESTIONS

5. COMPANY / ENTERPRISES STAGE

Please evaluate the statements below from 1-5 taking into consideration your expectations (lower value 1 higher value 5), or answer YES or NO .

About the PERSONAL CODE:

The first 2 letters identify your country (e.g. ES or UK) the other 2 the first letters of your name and surname

*** Mandatory Field**

Email address *

My Personal Code (4 letters/numbers) *

Name

Age *

Gender *

☐ Male

☐ Female

1. Have you worked previously in the Soil and water bioengineering sector? *

- ☐ YES
☐ NO

2. Do you think engaging in the Soil and water Bioengineering Sector has the potential to expand your business?

- ☐ YES
☐ NO
☐ I Don't know
☐ Not applicable

3. Do you think there has been an increasing demand for soil and water bioengineering approaches within the last decade?

- ☐ YES
☐ NO
☐ I Don't know
☐ Not applicable
☐ Other: _____

4. Do you think you need specific training in the field of the Soil and water bioengineering Sector?

- ☐ YES
☐ NO

5. What are the areas of formation do you feel are lacking or needed in the Planning and project skills development?

lower value 1 higher value 5

	1	2	3	4	5
Planning and design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Specialized knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practical knowledge on the main construction bioengineering techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practical knowledge on the main maintenance bioengineering techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. What level of specialization in soil and water bioengineering do you considered necessary/adequate for the Planning and project stage?

- ☐ graduate
- ☐ undergraduate
- ☐ professional
- ☐ specialized technical formation
- ☐ Other: _____

7. What are the areas of formation do you feel are lacking or needed in the Construction management and control?

lower value 1 higher value 5

	1	2	3	4	5
Construction direction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
management in the field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to understand the particular site circumstances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to organise service providers and subcontractors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to check the quality of building materials (live and inerts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ability to train in particular construction details	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
formation on construction site safety and quality management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. What level of specialization in soil and water bioengineering do you considered necessary/adequate in the Construction management and control field?

- ☐ graduate
- ☐ undergraduate
- ☐ professional
- ☐ specialized technical formation
- ☐ Other _____

9. What are the areas of formation do you feel are lacking or needed in the Technical training for construction workers?

lower value 1 higher value 5

	1	2	3	4	5
practical formation on construction techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
handling the different types of living and inert construction materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
safety rules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
maintenance works	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. What level of specialization in soil and water bioengineering do you considered necessary/adequate for the technical training for construction workers?

- ☐ graduate
- ☐ undergraduate
- ☐ professional
- ☐ specialized technical formation
- ☐ Other _____

11. Do you think the technical knowledge within your company allow you to easily deal with soil water bioengineering works?

1low....5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Do you think that, within your enterprise, your employers/colleagues need any training course on Soil and water bioengineering?

1low....5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Do you think within your enterprise, you need an expert in:

1low....5 High

	1	2	3	4	5
Agronomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Topography	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil/Geology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydraulics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. When sourcing soil and water bioengineering sector materials (vegetated geogrids, woods, autochthon plants, scion....) for your enterprise do you find them easily available?

1Low...5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Where do you usually source the specific soil and water bioengineering materials?

1low....5 High

	1	2	3	4	5
internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
providers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
fliers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
specialized industry fair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
advertisement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. To what extent do you feel that the Soil and water bioengineering works you have been involved in have been well planned in all their steps?

1 low....5 High

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. To what extent do you feel a clear criteria for the planting has existed in Soil and water bioengineering projects which you have been involved with? *

	1	2	3	4	5	
low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	high

18. To what extent do you feel that soil and water bioengineering work you have been involved with have experienced difficulties in obtaining the plants suggested by the designer?

	1	2	3	4	5	
Low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	High

19. Do you think the works you carried out in the past years are in need of a scheduled maintenance for which funding should be provided?

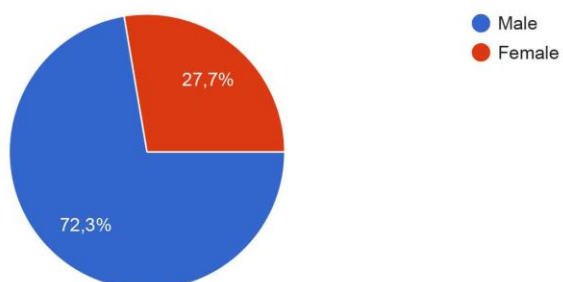
☐ YES
☐ NO
☐ OTHER: _____

PLEASE DESCRIBE YOUR PROPOSED SPECIFIC CHANGES, NEEDS OR NEW APPROACHES FOR DEVELOPING COMPANIES AND ENTERPRISES IN SOIL AND WATER BIOENGINEERING SECTOR

13.2 The Training ANSWERS

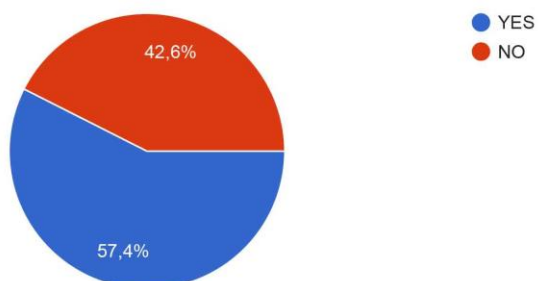
Gender

100% 0% 0%



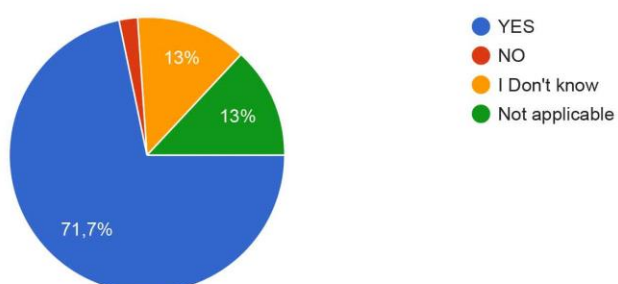
1. Have you worked previously in the Soil and water bioengineering sector?

100% 0% 0%



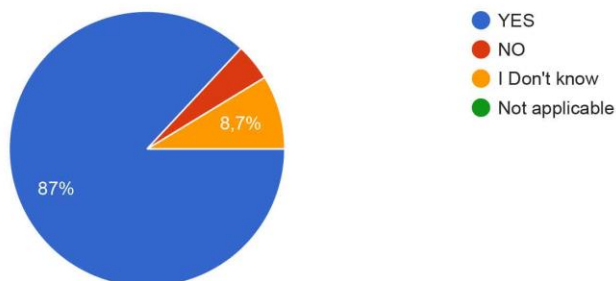
2. Do you think engaging in the Soil and water Bioengineering Sector has the potential to expand your business?

100% 0% 0%



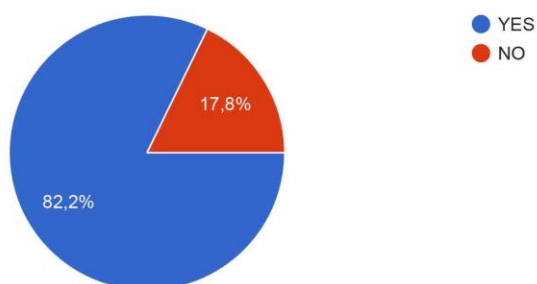
3. Do you think there has been an increasing demand for soil and water bioengineering approaches within the last decade?

32% 100%

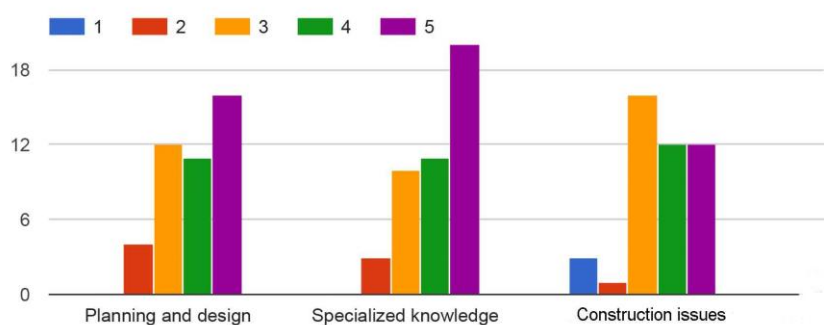


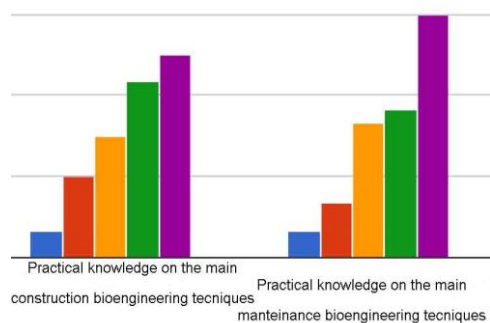
4. Do you think you need specific training in the field of the Soil and water bioengineering Sector?

41% 100%

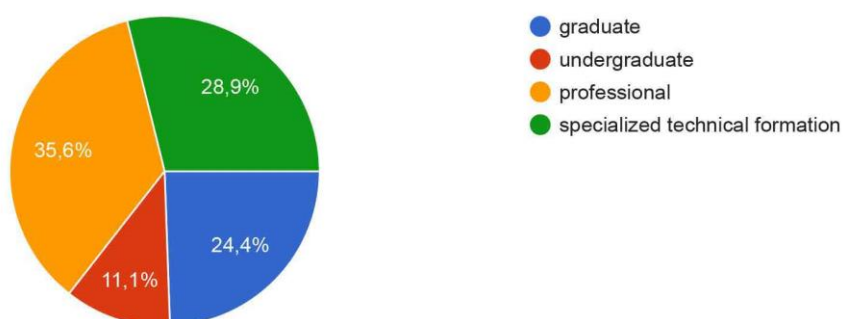


5. What are the areas of formation do you feel are lacking or needed in the Planning and project skills development?

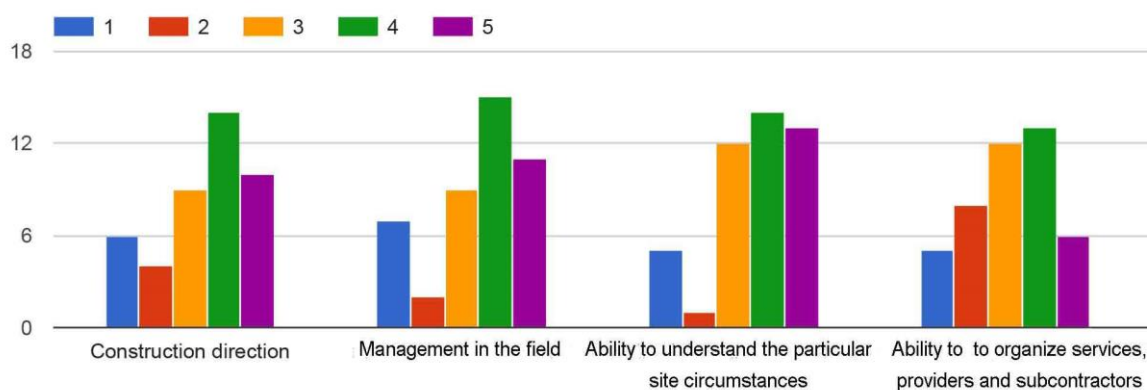


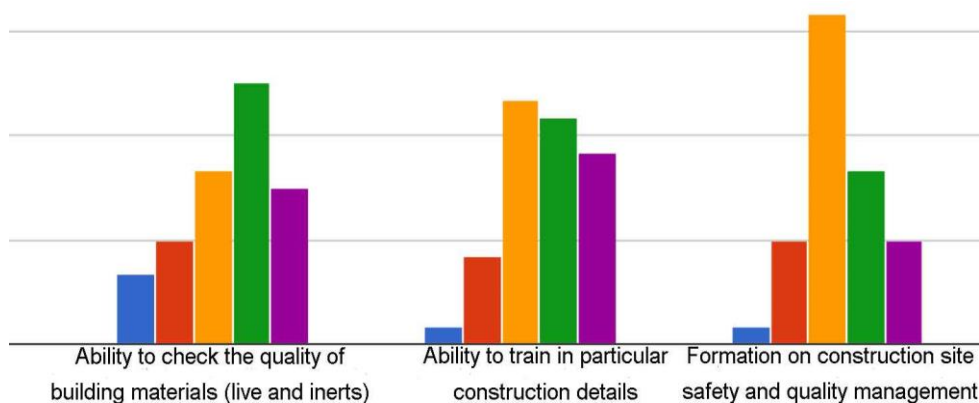


6. What level of specialization in soil and water bioengineering do you consider necessary/adequate for the Planning and project stage?

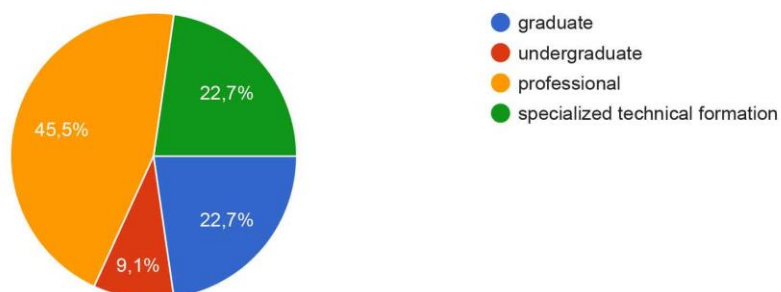


7. What are the areas of formation do you feel are lacking or needed in the Construction management and control?

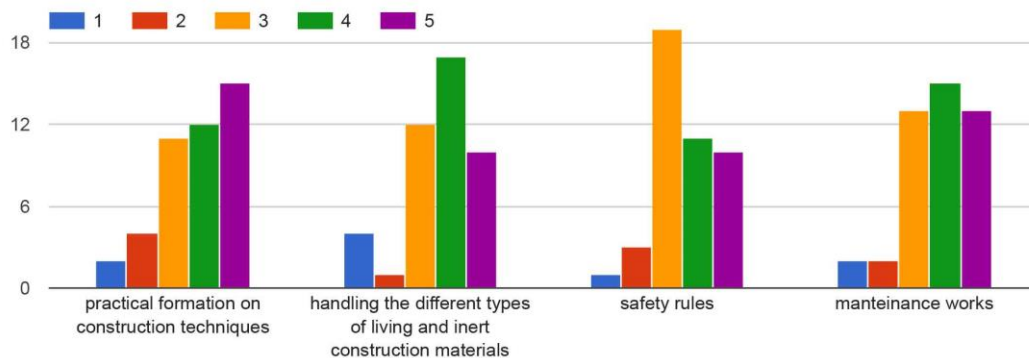




8. What level of specialization in soil and water bioengineering do you considered necessary/adequate in the Construction management and control field?

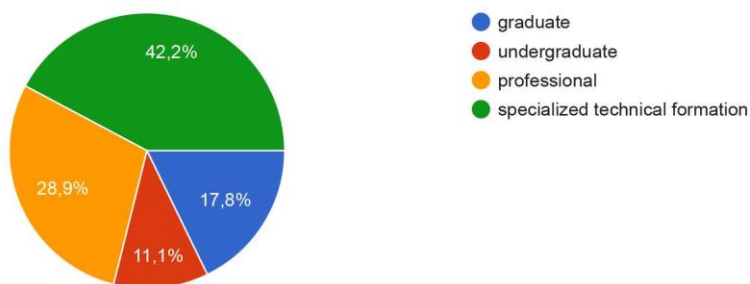


9. What are the areas of formation do you feel are lacking or needed in the Technical training for construction workers?



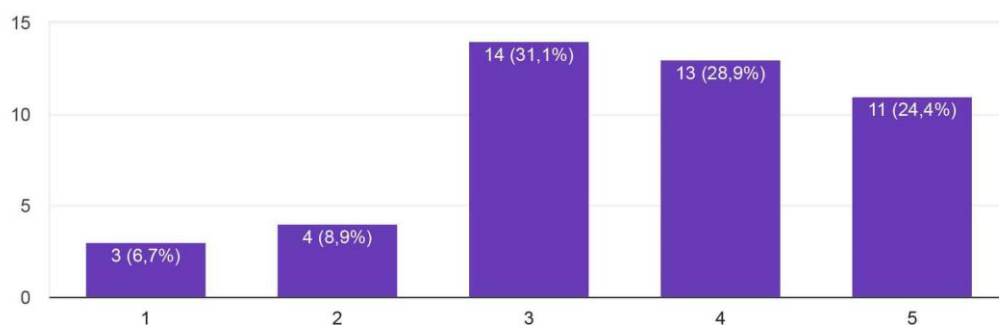
10. What level of specialization in soil and water bioengineering do you considered necessary/adequate for the technical training for construction workers?

Figure 10



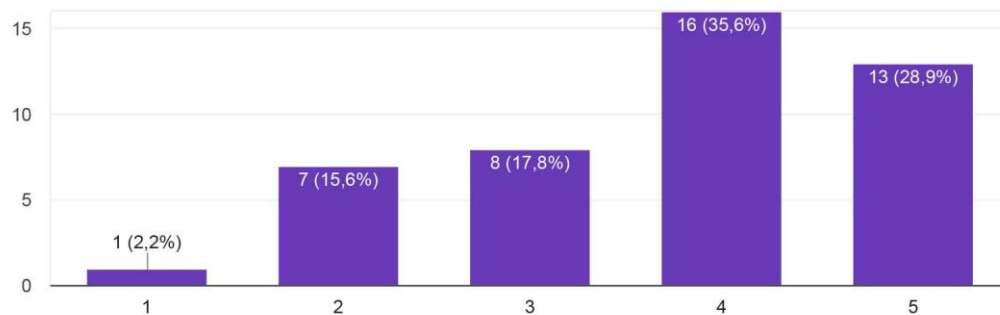
11. Do you think the technical knowledge within your company allow you to easily deal with soil water bioengineering works?

Figure 11

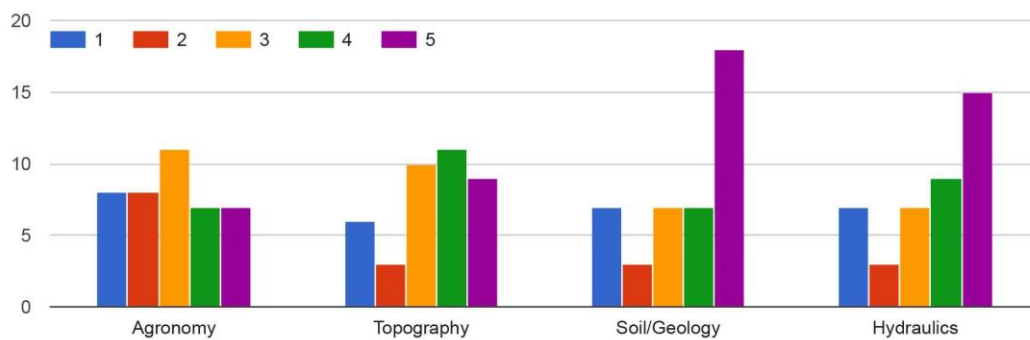


12. Do you think that, within your enterprise, your employers/colleagues need any training course on Soil and water bioengineering?

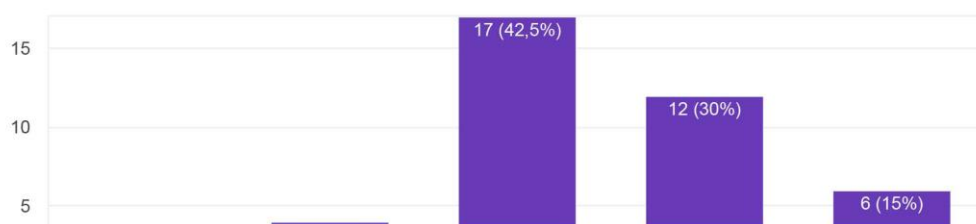
Bar chart



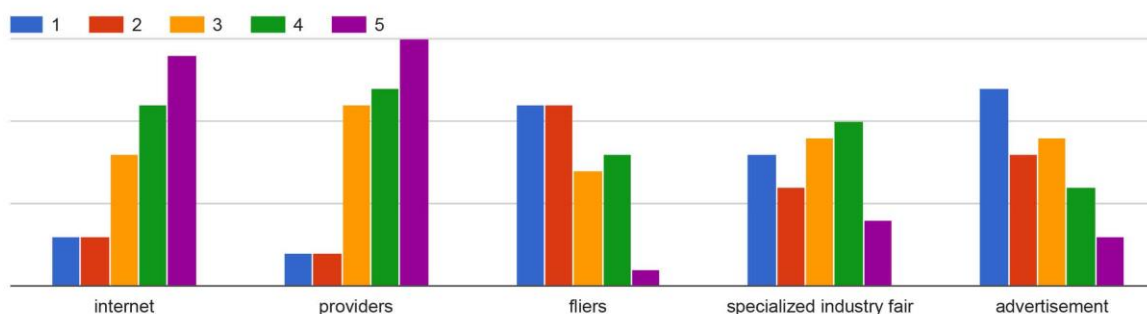
13. Do you think within your enterprise, you need an expert in:



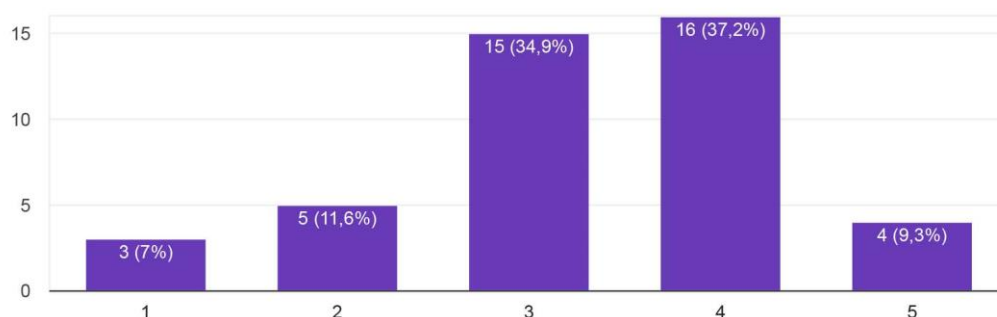
14. When sourcing soil and water bioengineering sector materials (vegetated geogrids, woods, autochthon plants, scion....) for your enterprise do you find them easily available?



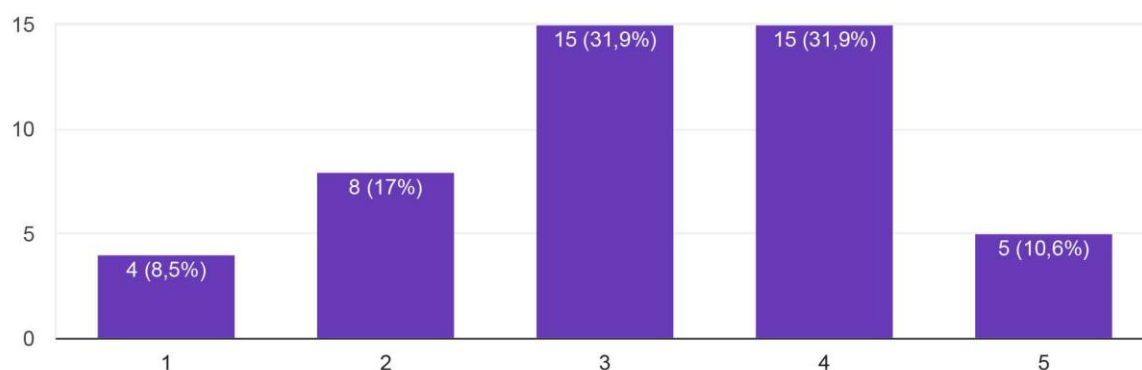
15. Where do you usually source the specific soil and water bioengineering materials?



16. To what extent do you feel that the Soil and water bioengineering works you have been involved in have been well planned in all their steps?

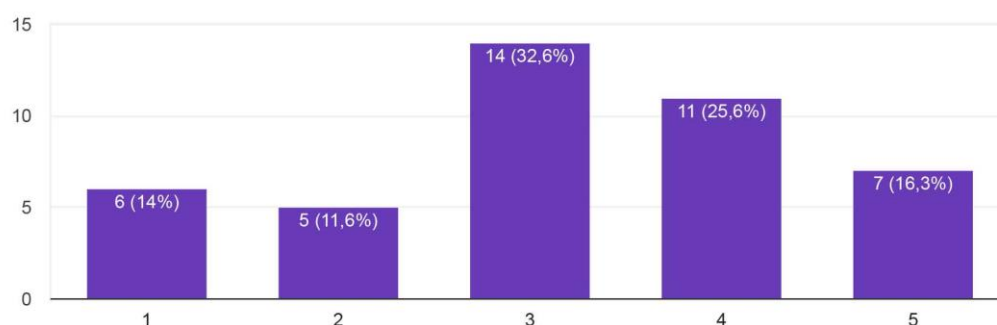


17. To what extent do you feel a clear criteria for the planting has existed in Soil and water bioengineering projects which you have been involved with?



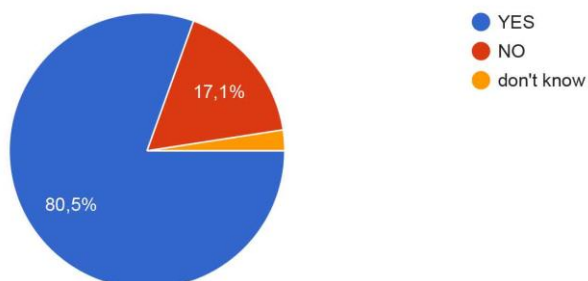
18. To what extent do you feel that soil and water bioengineering work you have been involved with have experienced difficulties in obtaining the plants suggested by the designer?

Yes No Don't know



19. Do you think the works you carried out in the past years are in need of a scheduled maintenance for which funding should be provided?

Yes No Don't know



PLEASE DESCRIBE YOUR PROPOSED SPECIFIC CHANGES, NEEDS OR NEW APPROACHES FOR DEVELOPING COMPANIES AND ENTERPRISES IN SOIL AND WATER BIOENGINEERING SECTOR

COMPANIES SHOULD COOPERATE WITH UNIVERSITIES AND RESEARCH INSTITUTES

FOLLOWING OF NEWLY DEVELOPED MATERIALS AND WORLD WIDE APPLICATIONS

Better construction direction, practical knowledge on bioengineering techniques construction and design

Use new and innovative tools

une meilleure formation des financeurs

Better training for the persons involved

workshop

More trained personnel and more material specific to a region

ΔΕΝ ΞΕΡΩ

Como asociación no tenemos poder de decisión, pero instamos a las entidades competentes, Ayuntamiento, CAM, CHT y Patrimonio Nacional, para que aúnen esfuerzos para la recuperación de las riberas de los ríos Tajo y Jarama a su paso por Aranjuez. Estamos luchando por ello.

Promoted by



Co-funded by the
Erasmus+ Programme
of the European Union



Co-funded by

In Partnership with



ISTITUTO TECNICO COSTRUZIONI
AMBIENTE E TERRITORIO "B. TALLINI"
FORMIA



UNIVERSIDADE DE ÉVORA





ECOMED is an ERASMUS+ co-founded programme promoted by Universidad Politecnica Madrid which aims to improve the specialisation level of the ecoengineering sector in Mediterranean areas and within this context, this project offers to provide a sound and practical knowledge based on the accumulated experience in order to offer to the next generation of practitioners and managers a solid and well suited training in ecoengineering restoration techniques in Mediterranean scenarios.

For further information

www.ecomedbio.eu