

ALPINE DROUGHT OBSERVATORY

Report on the assessment of user requirements for the
ADO (D.T5.1.1)

THIS PROJECT IS CO-FINANCED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND
THROUGH THE INTERREG ALPINE SPACE PROGRAMME
ADO - Alpine Drought Observatory (ASP940)

DATE OF DELIVERABLE: 30 APRIL 2021

START DATE OF PROJECT: 10-2019
DURATION: 32 MONTHS

Responsible partner: Piedmont Region

Dissemination level: Public

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1. Introduction

Purpose and scope of the report on the assessment of user requirements for the ADO platform (Deliverable D.T5.1.1)

The ADO project aims to create an online platform for drought monitoring and forecasting with specific indicators for the Alpine Space region.

The purpose of this report is to assess user requirements related to the ADO platform.

The user requirements come from stakeholders who are either directly involved in the project as observers or who are part of a target group that are considered in the communication strategy. Furthermore, the user requirements were also drawn from the case studies described in WP T5.2 and from the reports of the first national workshop held in the partner countries.

2. Questionnaire

It was proposed a questionnaire, aimed at stakeholders (public administrations, trade associations, water users, universities and research institutions), witch aimed to collect the requirements of users of the ADO platform in terms of content data, access and user interface.

The questionnaire was made available through the Google Forms platform on 01/22/2021 and was given as a deadline for its compilation on 02/28/2021. The questionnaire is divided into 5 sections:

- Country and stakeholder type
- Data contained in the ADO platform
- Access to the platform and User interface
- Use of the platform
- Other

For each question was asked to indicate a score on a scale of 1 to 5, where 1 is "little" and 5 is "much".

Below are the considerations from the evaluations of the replies for each section of the questionnaire.

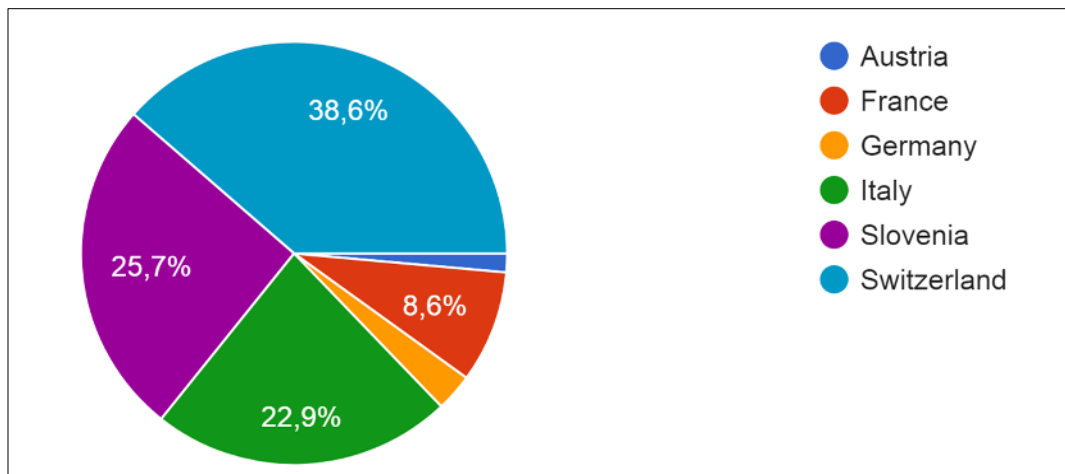
1.1 Country and stakeholder type

There were 70 completed questionnaires. We then proceeded with an assessment of the responses both by individual country and by type of stakeholders in order to understand whether there were particular requests/needs from the various partner countries or within the various types of stakeholders.

The analysis made did not reveal any substantial differences between the responses submitted by the partner countries.

1. Indicate the Country

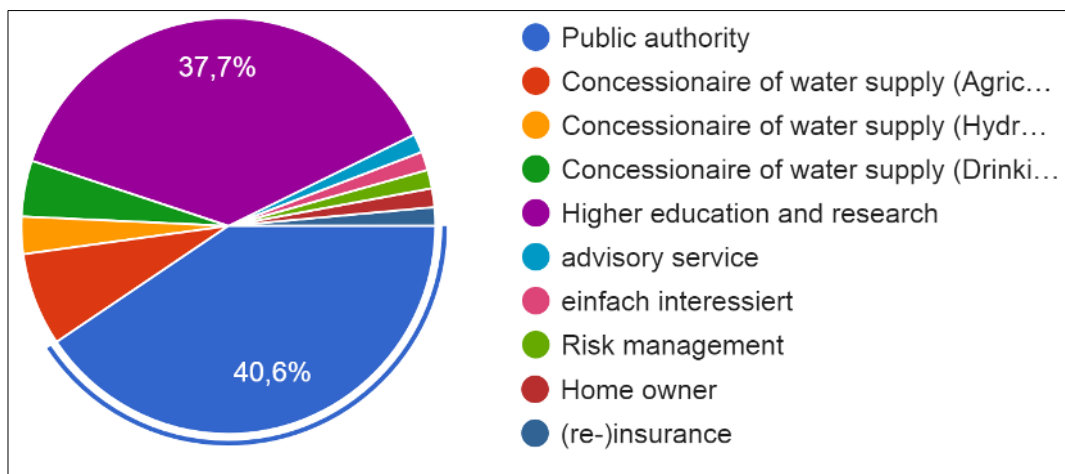
Answers 70



The stakeholders who sent the highest number of responses belong to the Public Authority and Higher Education and Research categories; the concessionaires (agriculture, hydroelectric, drinking water supply) are a small number but the answers indicated are consistent between the types of concessionaires and this allows some considerations to be made.

2. Indicate what kind of stakeholder you are

Answers 69



1.2 Data contained in the ADO platform

In general, there was positive feedback on the need for a system for forecasting any shortage of water resources in the short / long term.

Most stakeholders believe that a weekly and / or monthly bulletin is useful while a daily bulletin is considered ineffective. Consequently, the provision of a short-term warning system (e.g. 3 days) is considered to be of little use. In particular, it has been reported that monthly bulletins/forecasts are useful for the operational organisation of the actions to be taken for the operators of the integrated water service in the event of a lack of water.

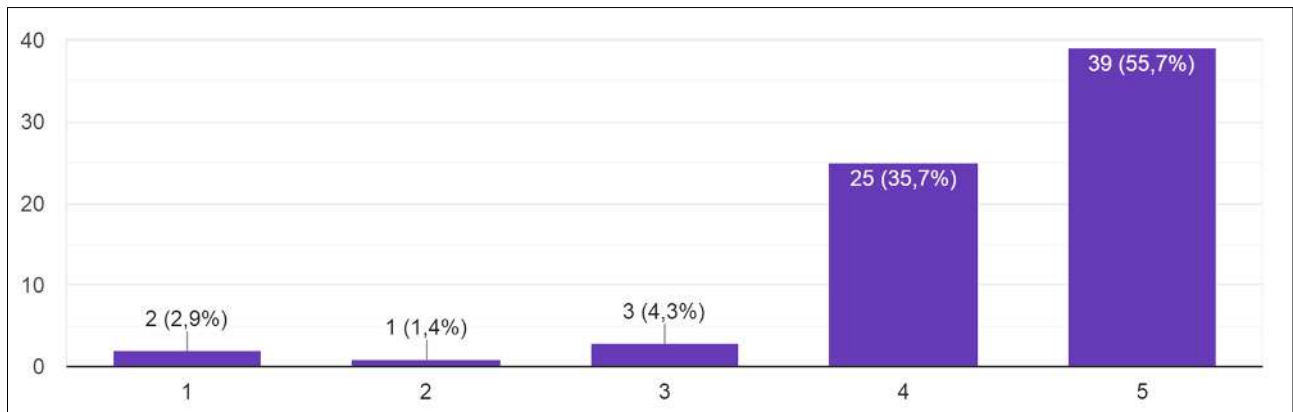
The parameters of precipitation, temperature and soil moisture are considered by most of the stakeholders to be very important in order to monitor any shortage of water resources. Soil moisture is not considered as a basic parameter for irrigation concessionaires. Other parameters considered useful are evapotranspiration, snowpack and wind. Furthermore, some stakeholders have indicated the groundwater level as an interesting parameter.

The availability of statistical analysis (time series, trends, indicators used for the analysis of extreme events, etc.) is considered useful for most stakeholders, this is not the case for irrigation concessionaires. More useful in general is a summary of data on different time and spatial scales in the form of georeferenced maps and graphs, while the summary is considered to be less incisive through tables.

Below are the graphs with the statistics for each response.

1. Is a forecast of any short / long-term lack of water resources useful?

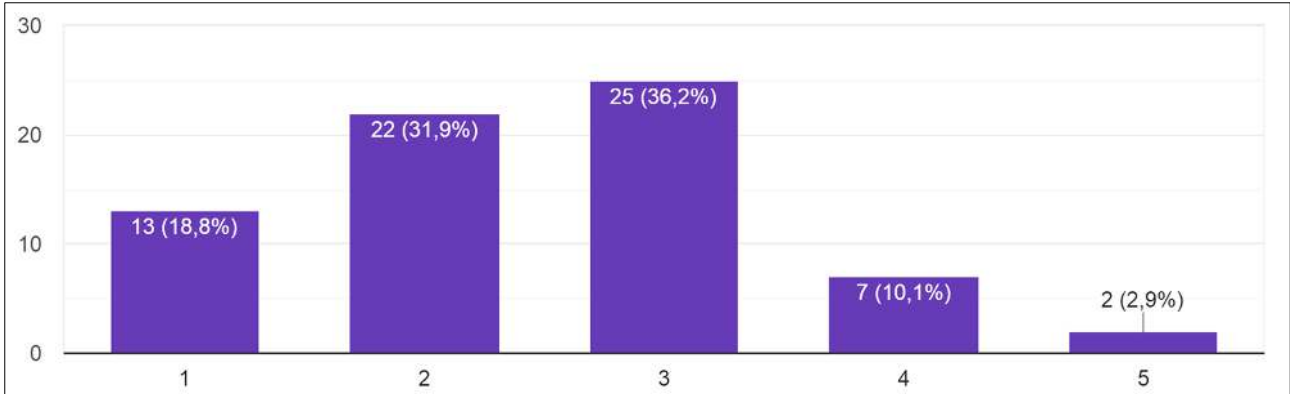
70/70 Answers



2. Do you find it useful to make the bulletins available:

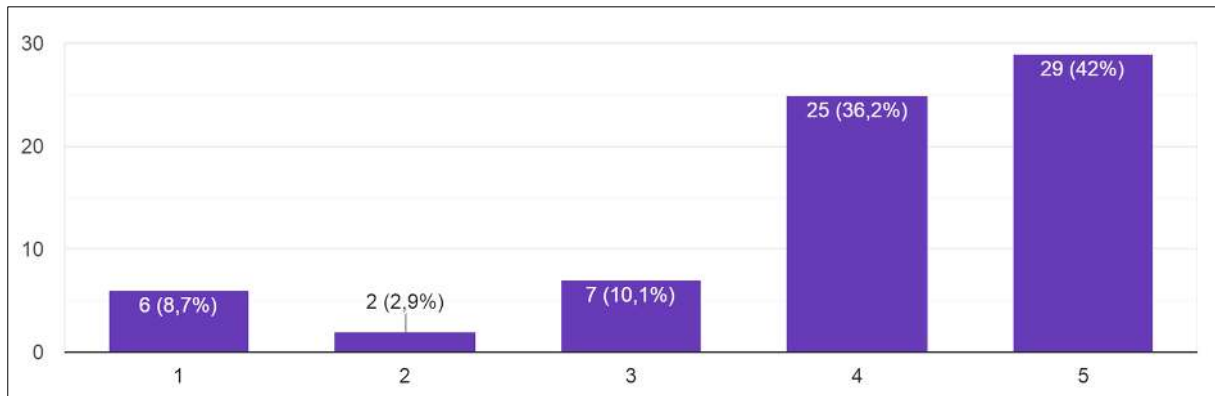
a) daily

69/70 Answers



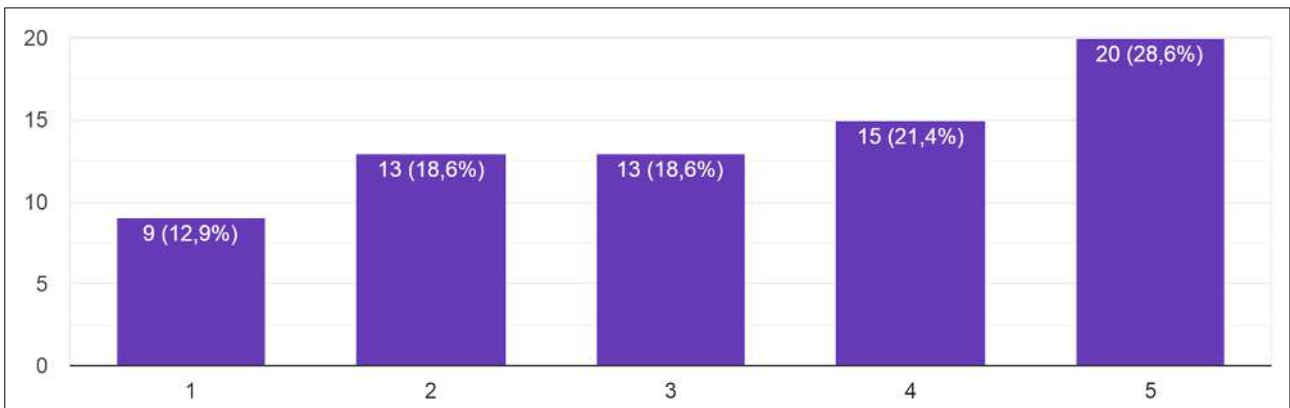
b) weekly

69/70 Answers



3. Do you find it useful to set up a short-term warning system (e.g. 3 days)?

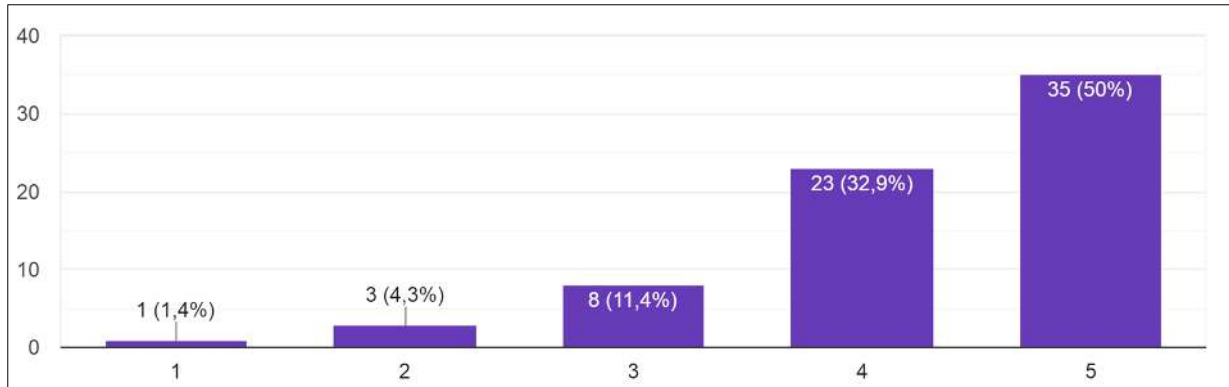
70/70 Answers



4. It is considered useful to consult data relating to:

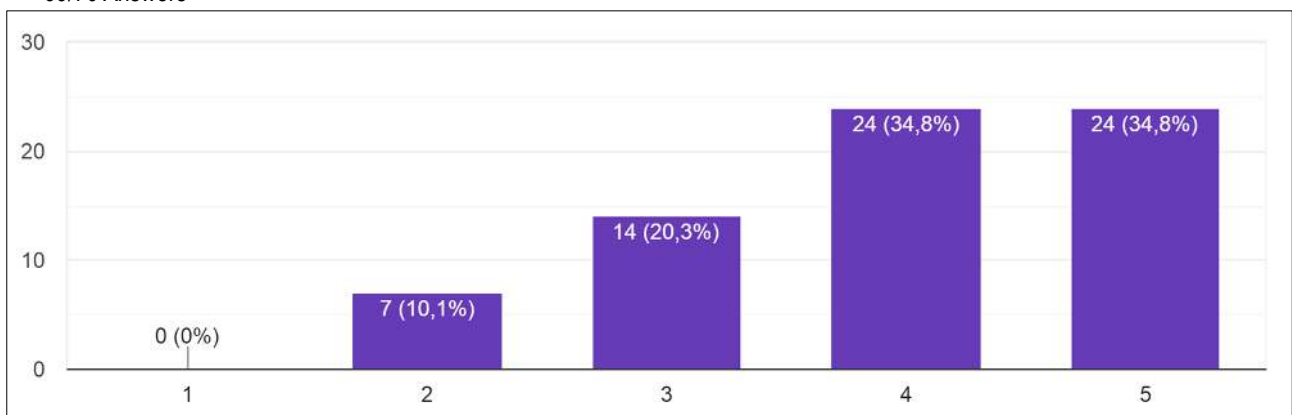
a) rainfall

70/70 Answers



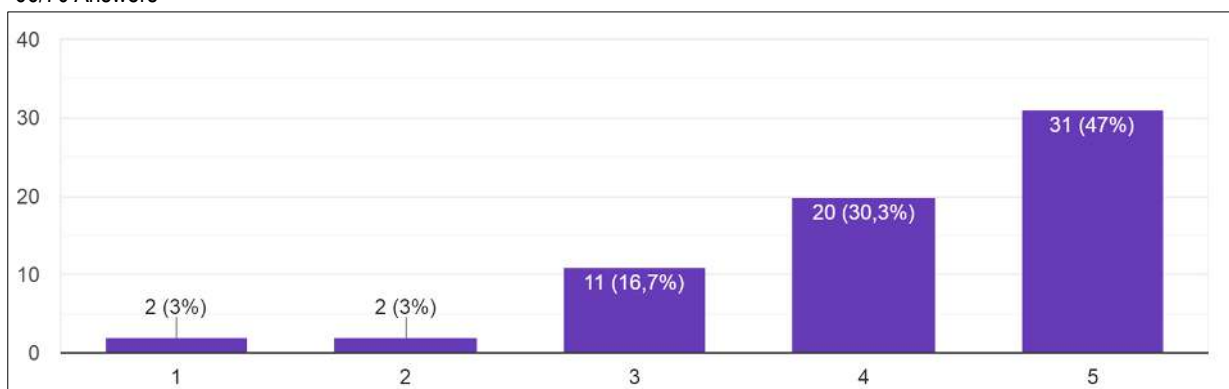
b) temperature

69/70 Answers



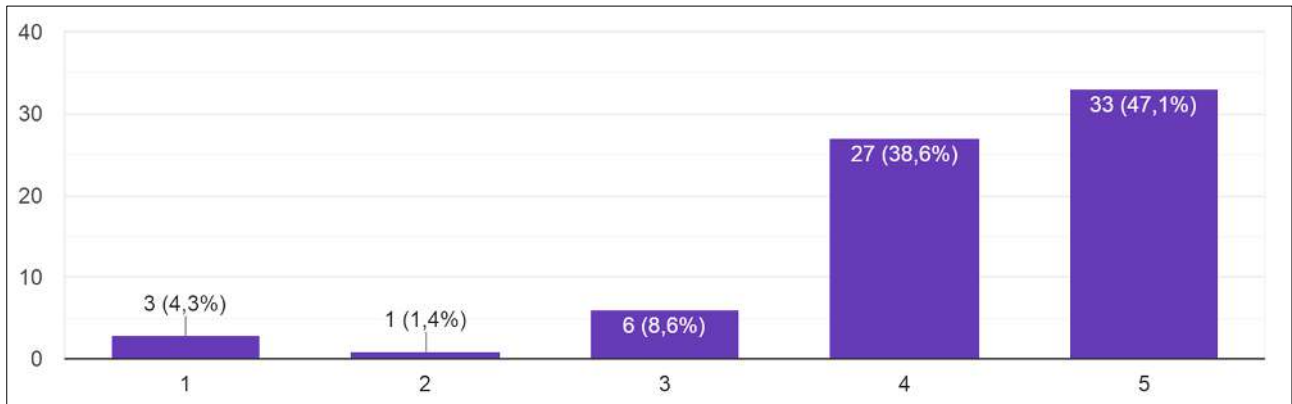
c) soil moisture

66/70 Answers



5. Is the availability of statistical analyzes (e.g. time series, trends, indicators used for the analysis of extreme events, etc.) useful?

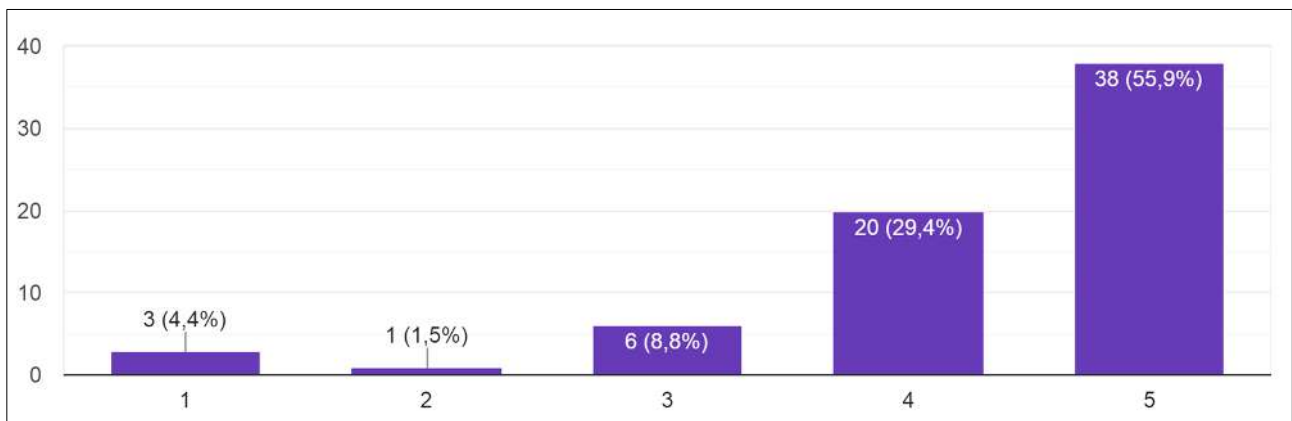
70/70 Answers



6. Is considered useful a summary of the data on different time and space scales in the form of ...?

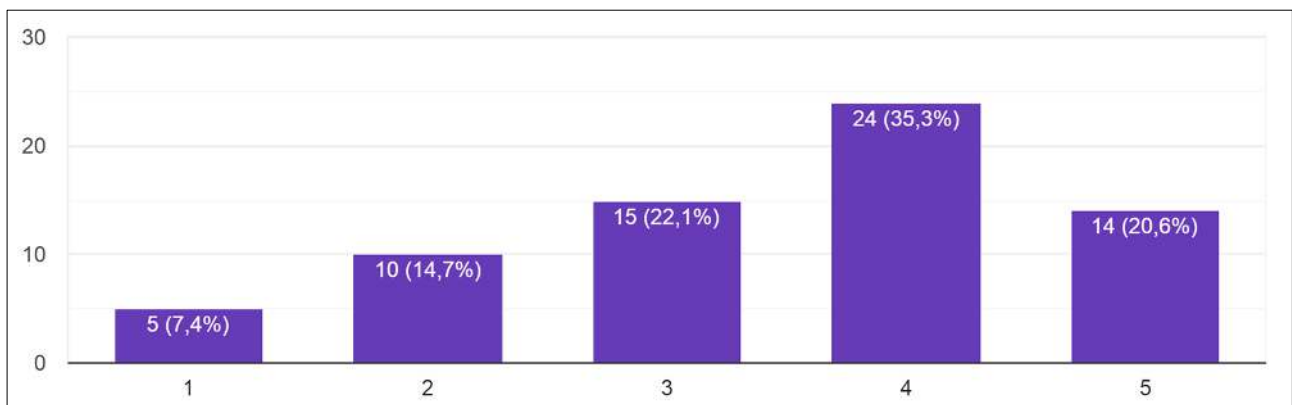
a) graphics

68/70 Answers



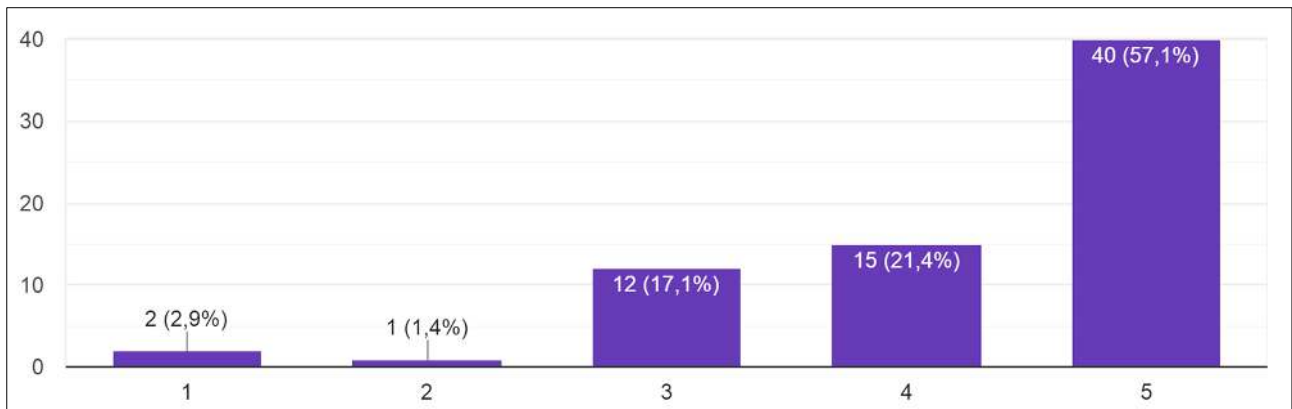
b) tables

68/70 Answers



c) georeferenced maps

70/70 Answers



1.3 Access to the platform user interface

As regards the consultation procedure, the preference was indicated to access the ADO platform directly or even to a specific site where a summary of the data is reported.

In general, communication via newsletters and messages on the mobile phone is considered ineffective, the latter option is instead considered useful for irrigation concessionaires.

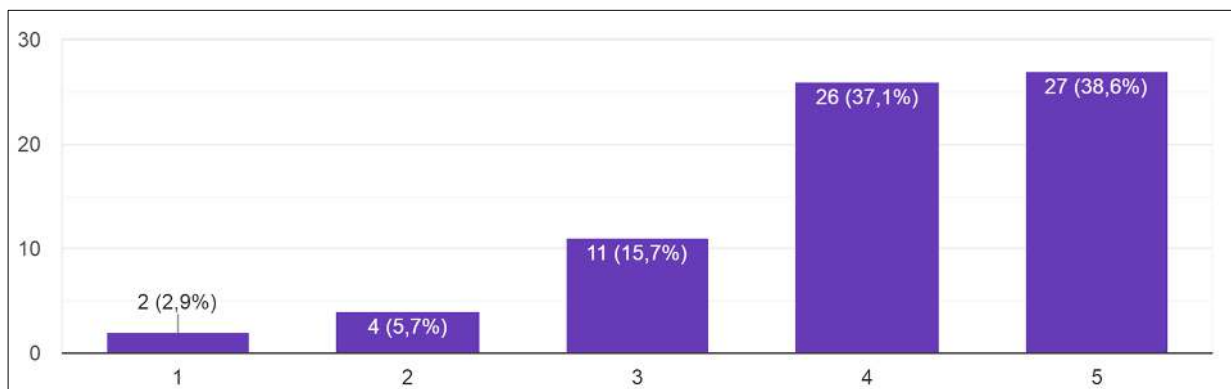
Finally, most stakeholders believe it useful to be able to report and / or upload data directly to the ADO platform.

Below are the graphs with the statistics relating to each answer.

1. It is considered useful to consult the data through:

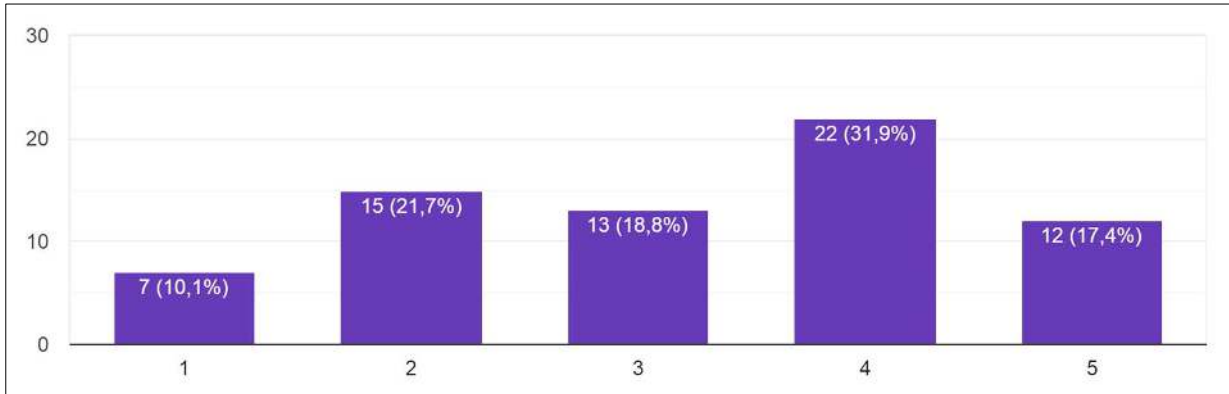
a) platform ADO

70/70 Answers



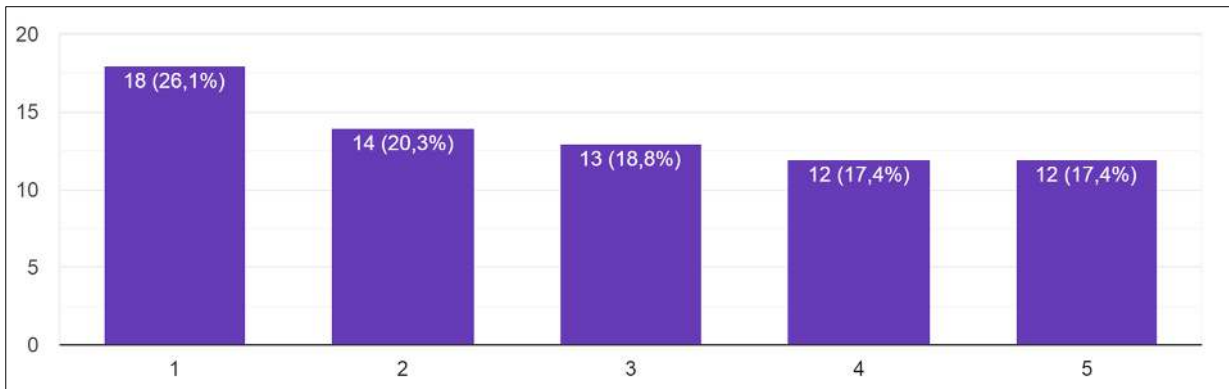
b) newsletter

69/70 Answers



c) message on mobile phone

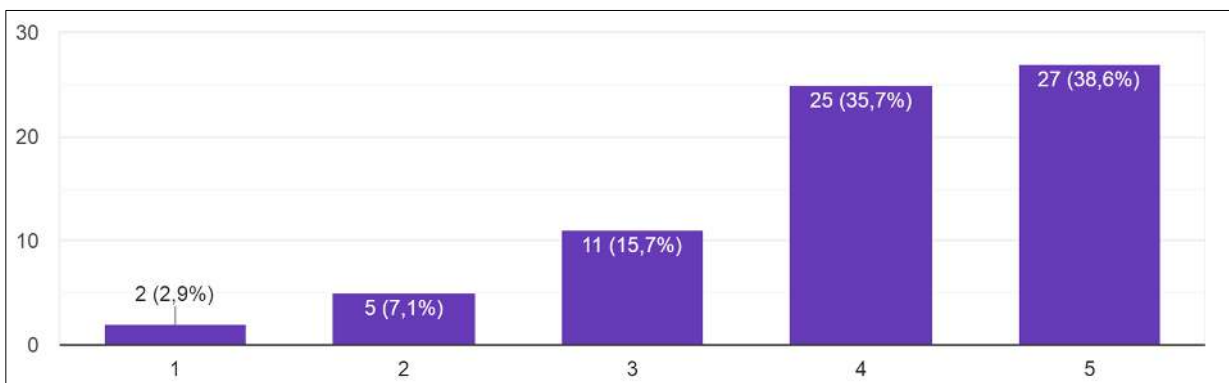
69/70 Answers



2. Do you find it useful to access:

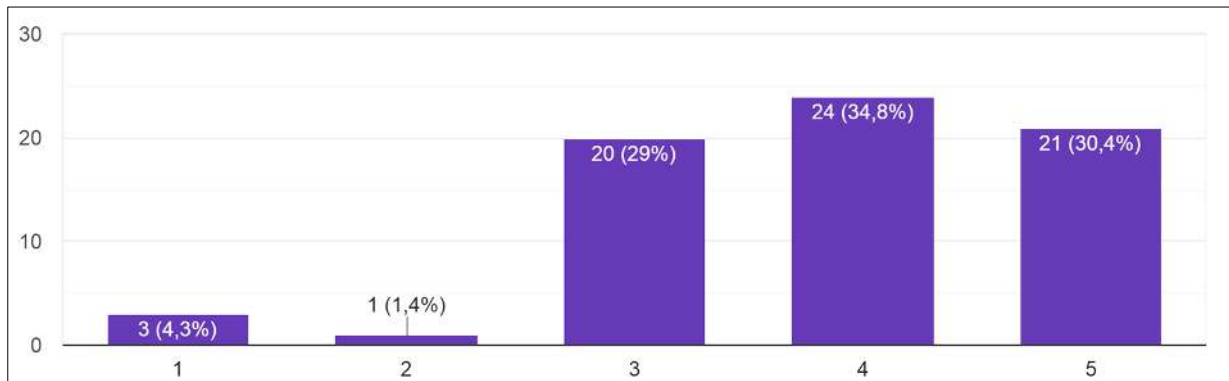
a) the ADO platform directly

70/70 Answers



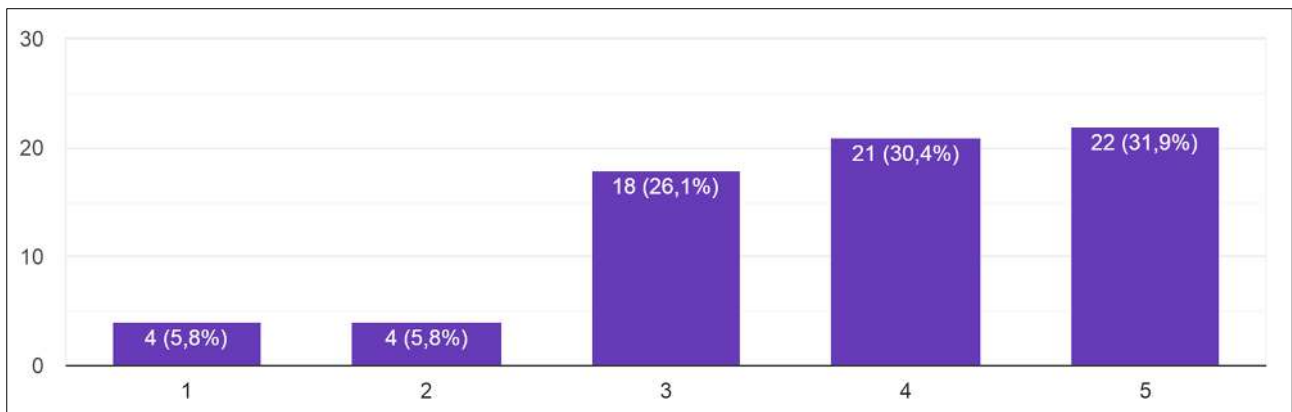
b) specific website with summary data

69/70 Answers



3. Do you consider it useful to be able to report and / or upload data directly to the ADO platform?

69/70 Answers

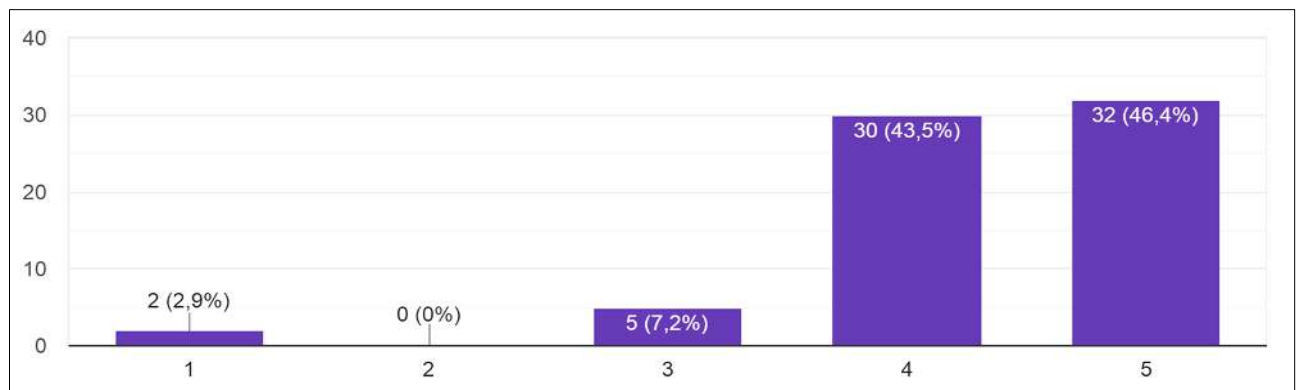


1.4 Use of the platform

Almost all stakeholders (90%) consider a drought forecasting system to be useful to very useful.

1. How useful do you think a drought forecasting system is?

69/70 Answers



2. How do you think that a forecasting system like the one in ADO can be made effective and therefore usable also on a local scale?




The following are some of the Answers received that can be food for thought within the project:










- appropriate timestep for forecasting, regular updates, statistical analyses comparing current to historical conditions;
- clear information provided on the time-scale covered by the forecast, and the uncertainties/limitations of the data provided depending on those time-scales. Also, drought definitions/specifying the target sectors for your forecasts (e.g. water resources, ecology, agriculture) will be important. Different metrics/definitions may be required for each;
- at a local scale some stakeholders have doubts about the usefulness of agricultural drought indicators (e.g. SSWI) because the sensitivity of soils and vegetation (or forage crops) to water limitation is highly variable at a fine scale. For agricultural issues, drought forecasting based on soil moisture indicators could have a limited scope if the spatial resolution is too coarse and/or if local soil and vegetation characteristics strongly modulate the effective responses of agrosystems. Drought forecasting based on hydrological indicators could be effective locally for other water uses (drinkable water, sink water for tourism and domestic herds), but this is very dependent on local context;
- establish a link between soil moisture, precipitation and ET for individual locations;
- to use it on longterm water requirements calculations for local or regional plannings of water ressources;
- forecasts should be regionalised as much as possible;
- it is necessary to organize events or seminars to teach stakeholders how to use the platform. Also to students and young professionals;
- the drought forecasting system should adapt to different uses (drinking, agricultural, energy), as a drought event does not necessarily have the same impact on a local scale and therefore the same alerts in the various uses. Therefore it would be advisable to provide diversified analyzes for the various uses;
- incorporating in the forecasting system also the critical features characterizing the local scale, such as the impact on tourism, local ecology and habitats of animal species living in the area in question;
- the forecasting system must be based on data, modeling, statistics and indicators / indices with adequate spatial and temporal resolution and adequately updated and documented. The usability of the information must be taken care of so that each stakeholder can immediately access the information they need. The forecasting system should be linked to a system of thresholds starting from which it should be possible to carry out actions planned in advance, and already defined in the drought emergency plans, including those on a local scale;
- forecasts must have a monthly / seasonal time horizon to allow better management by operators who must implement corrective actions in the event of drought events;










- with local (specific) parameters/indicators in the map form to better inform all kind of stakeholders (i.e. farmers, fire dep, researchers);
- accurate irrigation planning and smart use of water resources.

1.5 Summary Table

Below is a summary table with the approval rating for each question:

- High Interest (grade 4 and 5) 
- Indifferent (neither high nor low) 
- Low Interest (grade 1 and 2) 

Data contained in the ADO platform		
N°	Question	Interest
1	Is a forecast of any short / long-term lack of water resources useful?	
2.a)	Do you find it useful to make the bulletins available daily?	
2.b)	Do you find it useful to make the bulletins available weekly?	
3	Do you find it useful to set up a short-term warning system (e.g. 3 days)?	
4.a)	It is considered useful to consult data relating to rainfall?	
4.b)	It is considered useful to consult data relating to temperature?	
4.c)	It is considered useful to consult data relating to soil moisture?	
5	Is the availability of statistical analyzes (e.g. time series, trends, indicators used for the analysis of extreme events, etc.) useful?	
6.a)	Is considered useful a summary of the data on different time and space scales in the form of graphics?	

6.b)	Is considered useful a summary of the data on different time and space scales in the form of tables?	
6.c)	Is considered useful a summary of the data on different time and space scales in the form of georeferenced maps?	
Access to the platform User interface		
<i>N°</i>	<i>Question</i>	<i>Interest</i>
1.a)	It is considered useful to consult the data through platform ADO?	
1.b)	It is considered useful to consult the data through newsletter?	
1.c)	It is considered useful to consult the data through message on mobile phone?	
2.a)	Do you find it useful to access the ADO platform directly? a) the ADO platform directly	
2.b)	Do you find it useful to access specific website with summary data? a) the ADO platform directly	
3	Do you consider it useful to be able to report and / or upload data directly to the ADO platform?	
Use of the platform		
<i>N°</i>	<i>Question</i>	<i>Interest</i>
1	How useful do you think a drought forecasting system is?	

3. National Workshop and Case Studies

Finally, both the Reports of the National Workshops, held in the various partner countries of the project, and the descriptions of the Case Studies were analyzed to assess whether other needs and / or indications from the stakeholders emerged from these documents.

The following are the aspects considered most relevant and which deserve to be taken into consideration for the development of the platform but also for the ADO project in general:

- Among the parameters / indicators that best describe the impact of drought, the following were reported:
 - Flow and hydrometric level of lakes and rivers;
 - Hydrometric level of groundwater and level of availability of springs.
- The interest in the groundwater resource is also evidenced by the study / investigation activities that are envisaged in some case studies such as Study to investigate the impact of drought on the groundwater quantity and quality, Study to investigate the (ground) water demand for future agricultural irrigation etc;
- Overall availability of water resources (annual volumes);
- There is also an interest in 3/6 month forecasts for a seasonal programming of reservoirs accumulations (seasonal winter contribution of snow, etc.);
- The level of detail (spatial and temporal resolutions) of the ADO platform is not known and therefore it is not possible to evaluate its potential use with respect to local issues. Furthermore, the connection and / or possible integration between the data sets used by the ADO platform and the local databases is not yet clear;
- Each of the actors / stakeholders has the competence and availability of partial data with respect to the complex of existing data; there is no single platform in which there is sharing of the data available for optimal management of the basin;
- There is an excessive and non-homogenous supply of forecasting systems that do not communicate outside the ranks of experts. A more usable and understandable drought forecasting system would be needed for non-experts in order to be able to lower data on the districts and be useful for Governance;
- Information and monitoring is seen as an important component of establishing a drought management and setting priority rights to water use in drought events in the future;
- Information platforms should also link with management rules and guidelines besides providing drought status information. In particolare viene segnalata la necessità di trasformare i dati in informazioni utili per un uso collettivo condiviso che crei la capacità decisionale e di reazione che è alla base della Resilienza stessa. Servirebbe sviluppare un piano di azione concertato a livello di bacino in modo tale che, quando si presenta una situazione di crisi idrica, ciascun attore abbia già chiaro che azione dovrà mettere in atto senza dover istituire “tavoli di discussione” che rallentano la capacità di reazione;
- Stakeholders are not willing to further brainstorm but need to see and test an information system now to effectively drive progress in drought management. Further stakeholder workshops therefore should only take place once at least a prototype of ADO and/or national monitoring platform(s) are in place and have been tested. Then, their actual use and benefit can be assessed for joint improvement and optimization.

4. Conclusions

A questionnaire was made available to the various stakeholders (public administrations, trade associations, water users, universities and research institutes, etc.), via the Google Forms platform, aimed at collecting the requirements of the users of the ADO platform in terms of data, content, access and user interface.

We then proceeded by making an evaluation of the Answers both by country and by type of stakeholders, in order to understand whether there were particular requests/needs from the various partner countries or within the various types of stakeholders. The analysis carried out did not reveal any substantial differences between the Answers sent by the partner countries and a certain homogeneity was also found in the Answers within the various categories of stakeholders.

Almost all stakeholders (90%) consider a drought forecasting system to be useful to very useful. In particular, the need was pointed out for the forecasting system to be based on data, modeling, statistics and indicators / indices with adequate spatial and temporal resolution and that such data be adequately updated and documented. The usability of the information must be taken care of so that each stakeholder can immediately access the information they need. The forecasting system should be linked to a system of thresholds starting from which it should be possible to carry out actions planned in advance, and already defined in the drought emergency plans, including those on a local scale.

Finally, both the Reports of the National Workshops, held in the various partner countries of the project, and the descriptions of the Case Studies were analyzed to assess whether other needs and / or indications from the stakeholders emerged from these documents. The aspects considered most relevant and which deserve to be taken into consideration for the development of the platform but also for the ADO project in general were then reported.