

Gender Equality Report
Reporting Period 3: 1-May-2018 – 30 April-2019

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4	Universität Bern (UNIBE)	Switzerland
5	University of Évora (UE)	Portugal
6	Technical University of Madrid (UPM)	Spain
7	Institute for European Environmental Policy (IEEP)	UK and Belgium
8	Foundation for Sustainable Development of the Mediterranean (MEDES)	Italy
9	ISRIC World Soil Information (ISRIC)	Netherlands
10	Stichting Dienst Landbouwkundig Onderzoek (DLO)	Netherlands
11	Institute of Agrophysics of the Polish Academy of Sciences (IA)	Poland
12	Estonian University of Life Sciences, Institute of Agricultural and Environmental Sciences (IAES)	Estonia
13	University of Ljubljana (UL)	Slovenia
14	National Research and Development Institute for Soil Science, Agrochemistry and Environmental Protection (ICPA)	Romania
15	Agrarian School of Coimbra (ESAC)	Portugal
16	University of Miguel Hernández (UMH)	Spain
17	Agricultural University Athens (AUA)	Greece
18	Institute of Agricultural Resources and Regional Planning of Chinese Academy of Agricultural Sciences (IARRP)	China
19	Institute of Soil and Water Conservation of Chinese Academy of Sciences (ISWC)	China
20	Soil and Fertilizer Institute of the Sichuan Academy of Agricultural Sciences (SFI)	China
21	CorePage (CorePage)	Netherlands
22	BothEnds (BothEnds)	Netherlands
23	University of Pannonia (UP)	Hungary
24	Institute of Soil Science of the Chinese Academy of Sciences (ISS)	China
25	Gaec de la Branchette (GB)	France

Summary

“I learned new practices, and got warnings on threats I was not aware of. “

(woman, farmer, age 31)

The third reporting period in iSQAPER is used to organize feedback on the mobile application for Soil Quality (SQAPP) after the launch of the 1st version. To test the SQAPP a broad spectrum of the iSQAPER study site stakeholders were asked to use it and fill an elaborate, gender disaggregated, questionnaire. The nearly 100 questions were answered by around 90 stakeholders of whom 32 (36 %) women. The questionnaire has answer categories, differing from ordinal scales (very relevant to irrelevant) to open answers, and therefore results in a lot of information. Apart from comparisons in numbers and percentages, some probability tests were taken on the ordinal and nominal answers to see if there are gender significances in the responds. There were a few responds passing the gender significance tests, (about soil biodiversity and soil acidification), but they do not look like an issue, since they are not explicitly mentioned further by the (women) respondents in the remarks. The conclusions on gender differences in the subjects will therefore remain in the sphere of gender related “nuances” in the responds, (women even little more positive than men about the use of the SQAPP), worthwhile to take into account, but not fit for hard gender conclusions concerning the content of the iSQAPER project. The method however could be valuable in further related research, to see if the “nuances” should be translated to “gendered interests or needs”.

“The interaction in the application is easy and simple. The app is an added value for partnering with private companies, Associations and Technicians.”

(man, farmer, age 40)

iSQAPER 3rd gender equality and diversity report

3rd reporting period: 1-5-2018 – 30-4-2019

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1. Introduction

This gender equality and diversity report gives an update on the gender equality iSQAPER staff in the 3rd reporting period. Also it gives the gender disaggregated data from selected SQAPP test stakeholders. It is also an attempt to address gender issues, where looking for gender related differences in opinions about the SQAPP tests.

The picture I ended my presentation with in Estonia, showed that in the first stakeholder inventory, next to the overlap in responds, there was a slight gender difference in the information that stakeholders are asking for and also on soil improvement practices. Women mentioned more often education and environmental protection, where men asked more about fertilization, in percentage. It shows that the combination of information from men and women users broadens the spectrum of solutions. The message is to involve women stakeholders where you can, since they are a minority in the involvement of iSQAPER stakeholders (17% women) so far, which is possible to explain within the context of about 25-35 % women in agriculture, and agricultural ownership in the broader sense (differs per country). Anyway the project is not intending to make this difference bigger, so we need some positive discrimination towards women stakeholders to make them more involved. And, regardless of the differences in numbers, to be taken into account when developing advice for agriculture. It is not about majority, but about how to get understanding for improvement taking into account the type of interest and knowledge the farmer or adviser has, the diversity in essence.

Where the review report remarked, that gender issues are basically not being addressed in the second reporting period, the explanation is, that gender issues are being addressed in the total approach of staff and stakeholders. By monitoring the project staff, where the number of men and women who are being contracted for the project, are counted, and their position in the research teams are being compared and explained. And, by analysing the results of the stakeholder questionnaires, if there are gender differences in the results, and if the results are being used in the recommendations for soil improvement.

This report is mainly about the results from the iSQAPER staff in the 3rd project period and from the gender disaggregated stakeholder feedback to the 1st SQAPP version on advice for soil improving agricultural management practices (AMP's).

Here I want to thank Abdallah and Tatenda for the elaborate gender disaggregated questionnaire and the results in the data Excel file. And of course many thanks to the iSQAPER study sites (Slovenia, Romania, Spain, Portugal, Estonia, Greece, France and Poland) that helped to gather the stakeholders to test the SQAPP and respond to the questions. There were a lot of questions to be answered, which must have asked a lot of patience from the stakeholders as well as the study site leaders. Also I want to thank the (students from) WUR and the iSQAPER study site leaders from in Albaida region. And last but not least Rob for supporting me with the statistical tests on significance of the gender data.

2. Approach

Gender equality within the project context, can be distinguished in the level of organisation and the level of content. The organisation is operationalized in the numbers of men and women in the project staff, and the diversity in their project roles, here we count the different academic roles and “other” roles (Chapter 3). And the content of the research is being looked at from a qualitative and a quantitative perspective; qualitative through open questions and comparing the subjects of the answers. In quantitative way we compared the answers from men and women statistically and looked for significance in gender relation of the answers.

To make a useful application for land management options and keeping the soil in a good condition and quality, the study site stakeholders were involved several times.

In the first reporting period an inventory among stakeholders expectations from the SQAPP was being done, these gender disaggregated data were analyzed and reported in the second reporting period. Although the women respondents were only 17 % of the total, we saw some qualitative difference in interest from the women and men being interviewed.

In the 3rd project period WP5 gathered gender disaggregated stakeholder feedback data from the 1st SQAPP version. These data were analysed as totals, in D5.1,(CDE, 2019) but in this report we show the analysis when the data are being gender disaggregated. In this data gathering, from a sample of SQAPP testers, the total numbers of testers was lower, than the total number of stakeholders, but the percentage of involved women was higher, 36%. Since there were 55 men and 32 women SQAPP test respondents, we did several quantitative tests on gender significance. Although we got some significance, the explanation for these answers is still a guess. For about 50 questions (100), the responds of the men and women, were compared through percentages. And also the open answers from men and women were being compared and are being used in the conclusions and project advice (Chapter 4).

Another separate SQAPP test qualitative methodology was used in Spain(WUR, 2018), with 11 respondents and also gathered gender disaggregated information. The comments of the three women farmers in the WP5 questionnaire and from the woman farmer in this separate Spanish research were used for qualitative information in chapter 5.

Several of the comments are being applied in the (second)B-version of the SQAPP.

In the final project period, several demonstration moments in the different study sites will follow. There will be an evaluation of these days by the study site leaders and they will so ask feedback from the stakeholders that are involved in these demonstrations. These evaluations are also prepared for gender disaggregated data, so we hope to gather more data to analyse and be supportive for improvement of the SQAPP, from a gender disaggregated point of view.

In answer to the review report:

Review remark:

In the second review report was referred to gender issues (“basically not addressed”) and of “orientation towards user needs”.

Answer: Addressing gender issues:

-gender issues are about gender (in)equality in science and agriculture in iSQAPER, and about gender diversity to be determined from the content of the research.

The (in)equality is being monitored during the project among staff and stakeholders, used for awareness raising and advice for some positive discrimination where necessary to reach the least biased equality levels (50% for staff and 35% for stakeholders in agriculture). The gender diversity is about the different gender perspectives towards the Agricultural Management Practices and the evaluation of the Soil Quality Application (SQAPP). The SQAPP tester questionnaire of WP 5 was gender disaggregated, so the answers were used for statistical analysis and tests for gender differences or issues.

Review remark

Also the reviewer asks whether *the beneficiaries aimed at “a gender balance at all levels of personnel assigned to the action?”* And *“In the stakeholders groups, the number of female stakeholders is well below what could be expected (e.g. the 2017Eurostat report indicates that female farmers in Europe are 35% of the total). In this respect, a proactive approach was already advocated in the first periodical report. Project staff is very aware of this issue”*

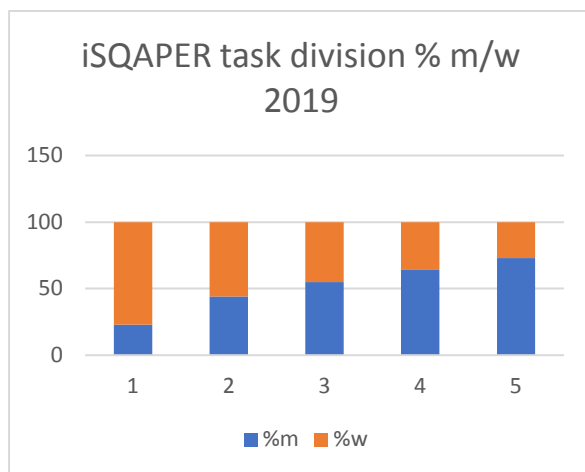
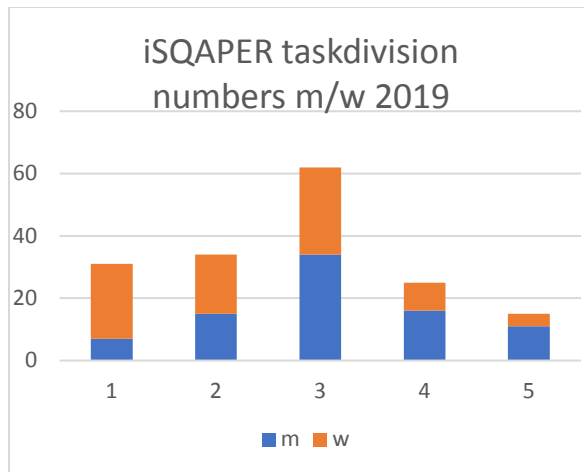
Answer: Gender balance:

In the gender equality report, the gender balance is being explained and in the 3rd project period, the balance improved from 44% to 49% women in the staff, where in the academic staff, women count for 43% and in the “other” category (laboratory staff, field technician, finance, manager), women count for 72% (26 women and 10 men in numbers).

Among the stakeholders involved in the SQAPP test questionnaire, there were 32 women and 55 men (and 2 who chose not to mention their gender). Although this is a sample of the total number of stakeholders we have, the percentage of involved women has improved from 17% to 36% of the total. So more than one third of the stakeholder SQAPP testing persons are women, from whom the answers were a part of the evaluation of the SQAPP, also the answers were checked in a gender disaggregated way (Chapter 4), to see whether there were gender related differences in the replies that should be taken into account in the reporting and the development of the SQAPP.

3. Results staff iSQAPER 2018/19

To monitor the numbers of **the staff** involved in iSQAPER, I received the input from all the study sites. In total numbers, the staff is perfectly balanced. Compared to the second reporting period, new people were contracted, some staff finished their input, in total 3 people less. Staff (was 167, now 164).



1= other staff

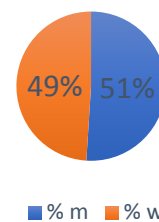
2= early researcher, < 4 years and/or PHD student

3= experienced researcher, 4 years and/or PhD holder

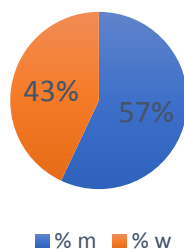
4= scientific team leader or WP leader

5= scientific manager/coordinator

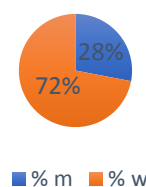
total 164
83(-5)m, 81(+2)w



academic staff
73(-8m), 55(-9w)



other Staff
10(+3)m, 26(+11)w



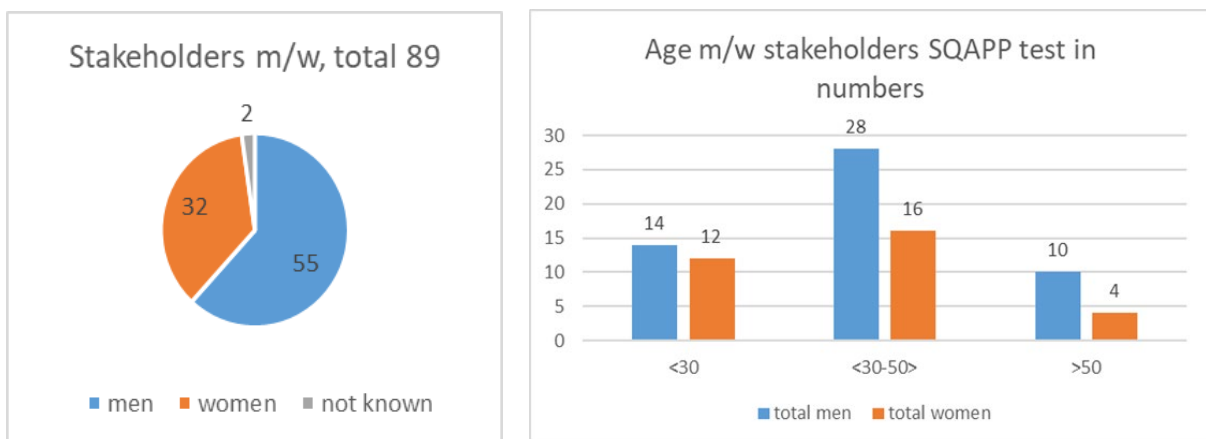
When looking at the type of positions of the staff, making a difference in academic staff (78%) and other staff (22%), more men than women are involved in the “academic staff”, but with 42% women reasonably balanced. And in the “other staff”, there are more women. This period on average, more men and women were contracted in the “other staff” and, the academic staff decreased in the project from 145 to 128, men (-8) and women (-9). (Annex 1).

4. Results SQAPP user feedback test stakeholders M/W

By receiving the results from the CDE stakeholder **SQAPP user feedback** test, which was gender disaggregated, it was made possible to see the gender equality and gender differences on the different aspects. I'll show you first the numbers, their age categories (4.1), the gender diversity per involved country, their roles (4.2), then, the gendered nuances in the expectations of the SQAPP (4.3), the satisfaction of the (m/w) stakeholders on the soil properties chapter (4.4), the gender significance concerning a few soil threats (4.5), the results on the "practices provided", and whether the stakeholders' expectations are being fulfilled or not (4.6). The SQAPP was not transferred in a Chinese version at the time of the testing, so the feedback is from the European iSQAPER study sites.

4.1 Numbers and age stakeholders

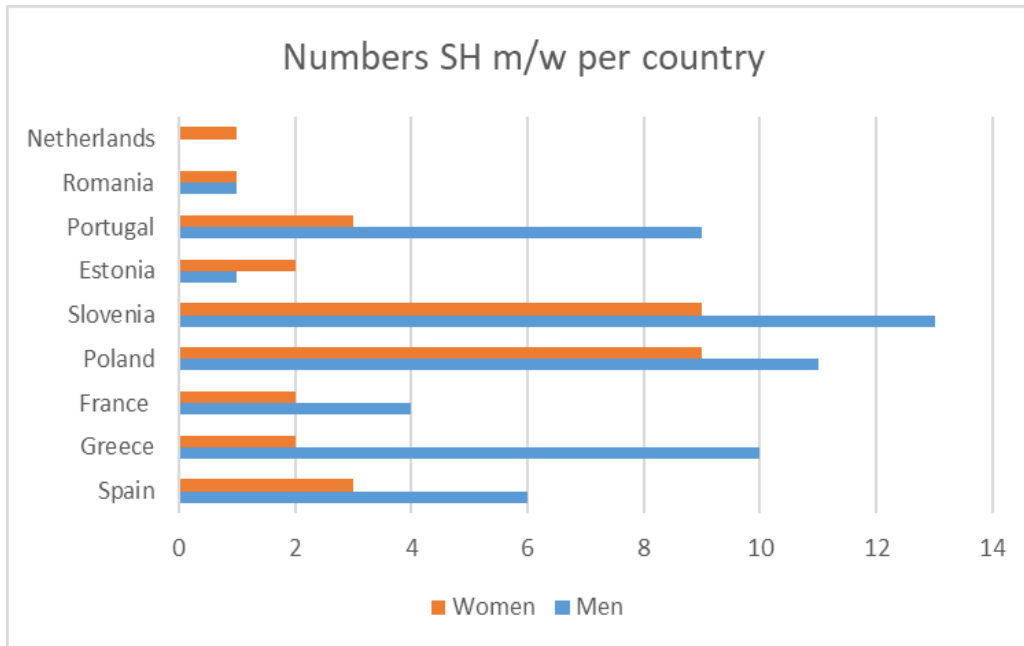
The SQAPP is developed for a test version and distributed in the plenary meeting of iSQAPER in Estonia in 2018. WP 5 leader CDE prepared a gender disaggregated questionnaire for SQAPP testing persons among the iSQAPER stakeholders at the study sites. This resulted in 89 respondents, 55 men, 32 women and 2 who preferred not to say their gender. Although this is a sample of the total number of stakeholders in iSQAPER, the percentage of involved women was 36 percent of the total. So one third of the stakeholder SQAPP testing persons are women. In the first stakeholder inventory 17 % were women, so this is improved. Most stakeholder test persons are between 30 and 50 years old.



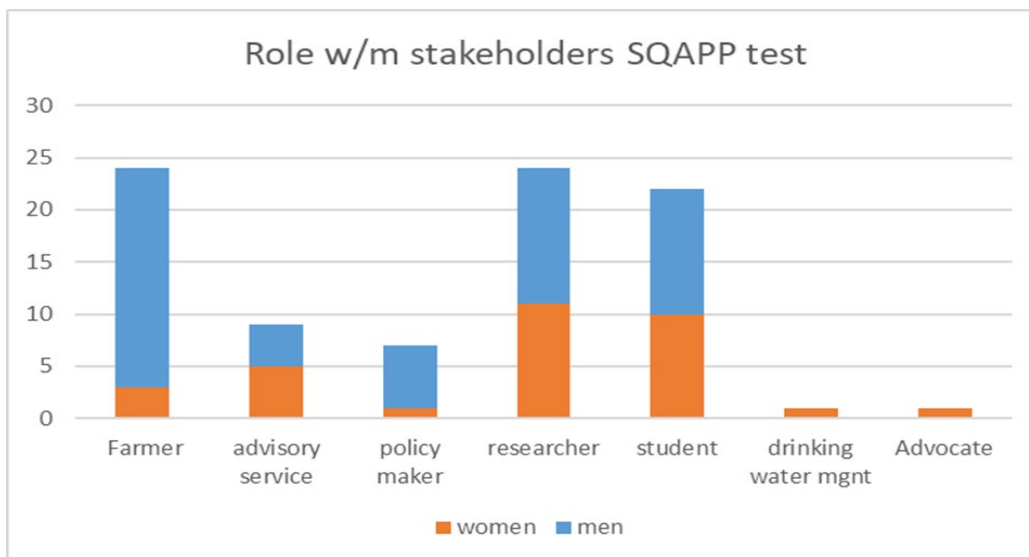
The women are reflected in orange, the men in blue.

4.2 Countries and roles of the SQAPP testing stakeholders

For the SQAPP test people from study sites, the women and men from 9 different involved countries responded. This is linked with the pedo climatic zone and the type of agricultural management and soil improvement practices. Every study site was asked to involve women.



This gives an overview of the roles from the men and women stakeholders that gave feedback on the SQAPP performance in numbers and gender disaggregated.



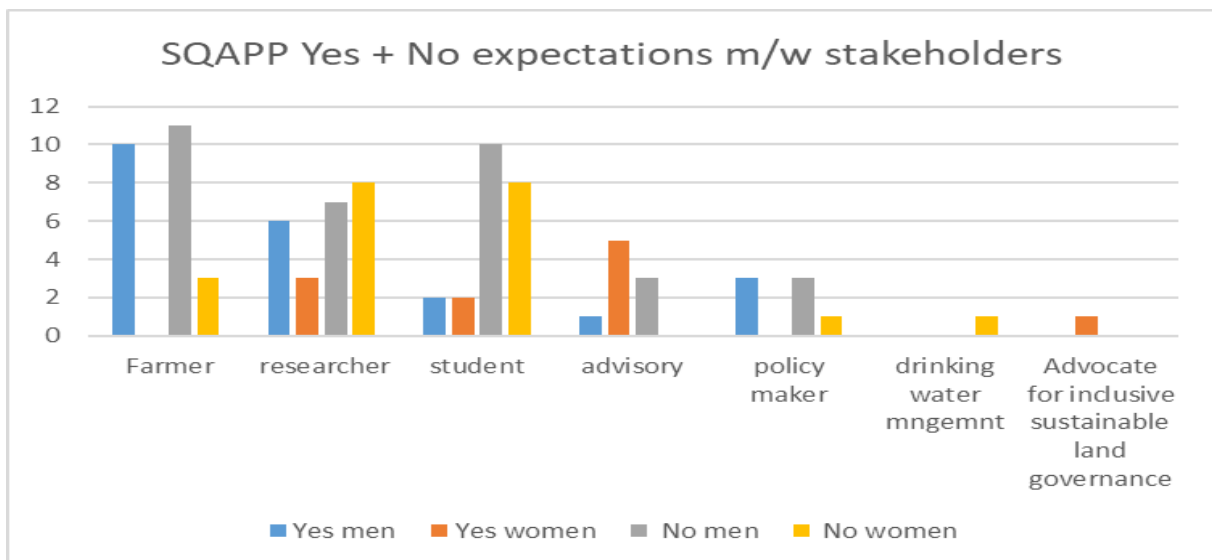
The researchers, student- and advisory service test persons are well balanced among men and women. From the 25 farmer stakeholders, 21 are men, 3 are woman and one didn't mention his or her gender. There was 1 woman from a drinking water company and one calling herself: "Advocate for inclusive sustainable land governance".

We will now look at the content of their comments.

4.3 Expectations from the SQAPP

This subchapter gives the expectations from the SQAPP from the different user groups;

- The expectations from the farmers to the possibilities of the SQAPP differ from “assessment and knowledge improvement about the soil” to: “appropriate recommendations and soil type needs for improved production”;
- The expectations from the researchers differ from: “improvement of soil management” to: “curiousness for the data and to facilitate research”;
- More women researchers have no specific expectations from the SQAPP (8 compared to 3 who do have specific expectations),
- Students (women and men) have no specific expectations from the SQAPP, women: 8 (no), 2 (yes) and men: 10 (no), 2 (yes);
- All 5 women from the advisory services do have specific expectations from the SQAPP, that differ from soil parameters and soil properties to user friendly info that can help their farmers to identify major soil threats and recommendations for solutions and good management.



Here you see the result of **the expectations** from the SQAPP by user group and gender disaggregated in numbers. Almost half of the responding farmers (10 from 25), but not the 3 farmer women, said they have expectations from the SQUAPP.

4.4 Satisfaction on the soil properties chapter

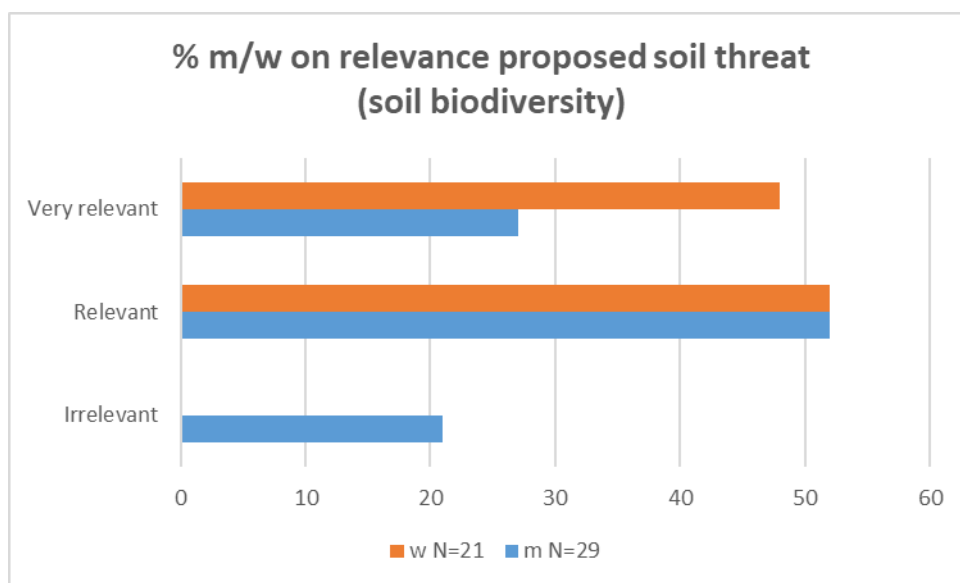
Among the testing stakeholders, most find the **Soil properties** chapter ‘good to satisfactory’. There were very few who said it was unsatisfactory, 3 men and 3 women. Comments and suggestions on the soil properties chapter came from 11 women and 10 men from different functions. Specific was the ‘difficulty of the information for use by farmers’ (mentioned by 2 women advisors who find the soil properties chapter unsatisfactory, and mentioned by several male farmers, two who find the chapter unsatisfactory also) and although they find the chapter satisfactory, several are questioning the data; two women want to know where they come from, the source of the data (woman advisor, she also mentions ‘The units of soil nutrients are different then we use in Slovenia’.) and they ask from which databases the data are extracted. Also a man, a farmer, asks how the data are being updated and who assesses the reliability of the data.



The percentages were taken when to be able to compare the content of the answers. In numbers this implies in respond to the satisfaction on the question: “How user friendly is the Soil properties chapter”: 29 men and 18 women for a “good” and 23 men and 11 women for “satisfactory”.

4.5 Gender significance

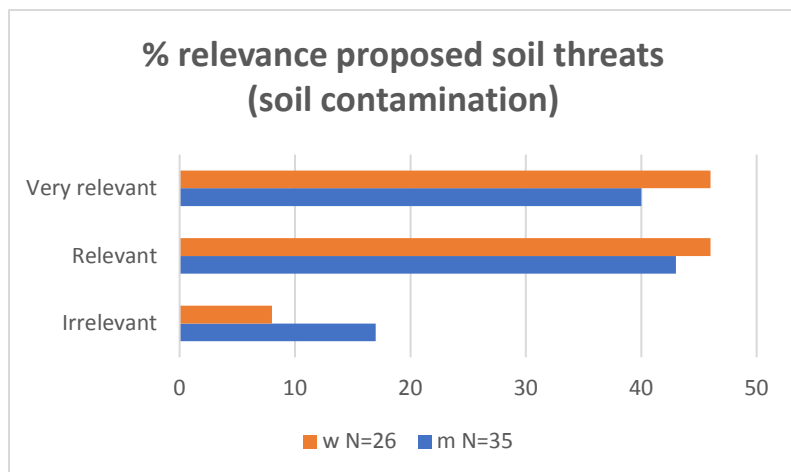
A gender equality **significance** test was done for all of the responses, 2/3 of them, that were appropriate for a Mann-Whitney-test, used for ordinal variables. And 1/3 t-test (with numerical values and yes/no answers). The questions were tested on significance of difference between the (average of all responds from) women and men, of them, 2 showed significance, this is the question: “How relevant are the **proposed soil threats** within the local context? [Soil biodiversity]”. Also “How relevant are the **proposed soil threats** within the local context? [Soil acidification]”. (Annex 2a). The women are more positive about the relevance of the proposed soil threats on biodiversity and soil acidification in the local context. Women respond between “very relevant and relevant” and men respond between “relevant and irrelevant”. Most of the other questions have differences in responds, but these are not proven gender significant. I have no explanation, it is not clear from the remarks whether biodiversity or acidification has gender specific attention.



A few more gender significances appear when the responds of advisors and researchers were tested as a user group separately: Significance among researchers can be found concerning in the question: How relevant are the **proposed soil threats** within the local context? [Soil organic matter decline] and [soil nutrient depletion], women researchers find it very relevant to relevant and the men researchers find it relevant to irrelevant.

Also gender related significance appeared when comparing responds of the combination of researchers together with advisors, it shows significance in the responds to the question: “How relevant are the proposed biological soil properties? [Estimated soil microbial abundance].” Again here the women find it very relevant to relevant and the men find it relevant to irrelevant. And this significance does not appear with the same proposed biological soil properties [macrofauna groups], nor with the proposed physical and chemical soil properties. (Annex 2b)

Three of the gender significances that appear, are related to the question about the relevance of the proposed soil threat within the local context. In several aspects there is something that women find it more relevant than men among these respondents. Still none of the other mentioned aspects to the question of relevance of the proposed soil threats (water and wind erosion, compaction, salinization nor contamination), show any gender significance in the responds.



Example of the responds to relevance of the proposed soil treats [contamination], shows differences among gender relevance in the responds, but no significance from the test.

Therefore one could say that the significance draws attention, but is not ready for a conclusion. It remains in the sphere of nuances that are hard to point out.

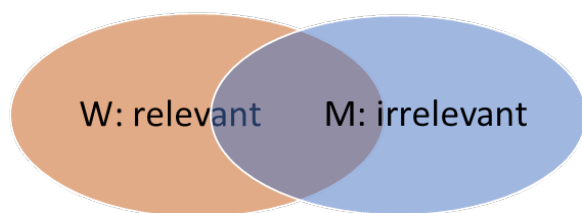


Figure 1 proposed soil threat: soil biodiversity/acidification;

Concluding:

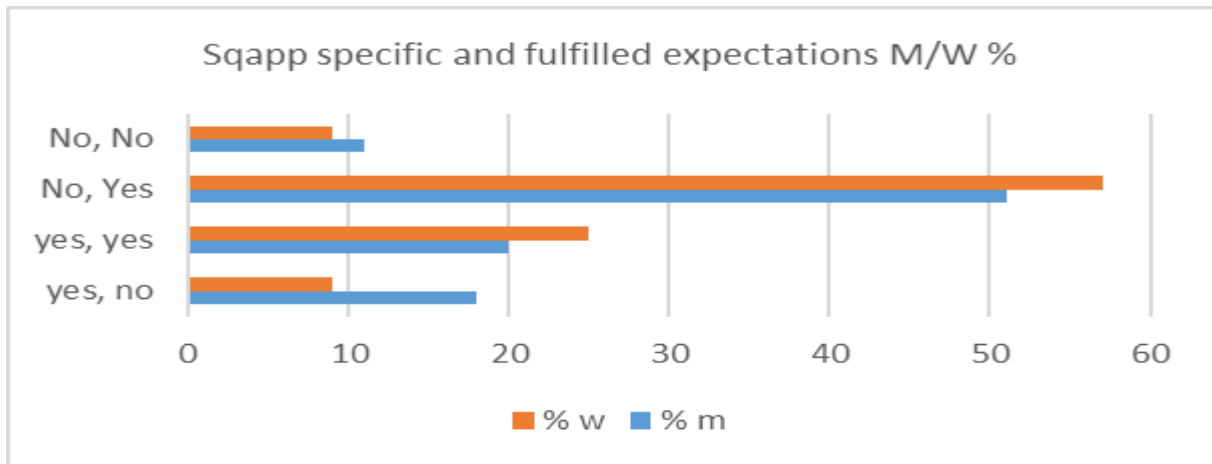
- Two questions with gender significant response from all SQAPP testers of proposed soil threats within the local context on bio diversity and acidification
- Many differences are being determined, but not significant for gender
- Another gender significant answer researchers on SOM decline and nutrient depletion
- One significance from researchers and advisors on relevance from the SQAPP of the proposed soil biological properties, the “Estimated soil microbial abundance”

4.6 Fulfilled expectations:

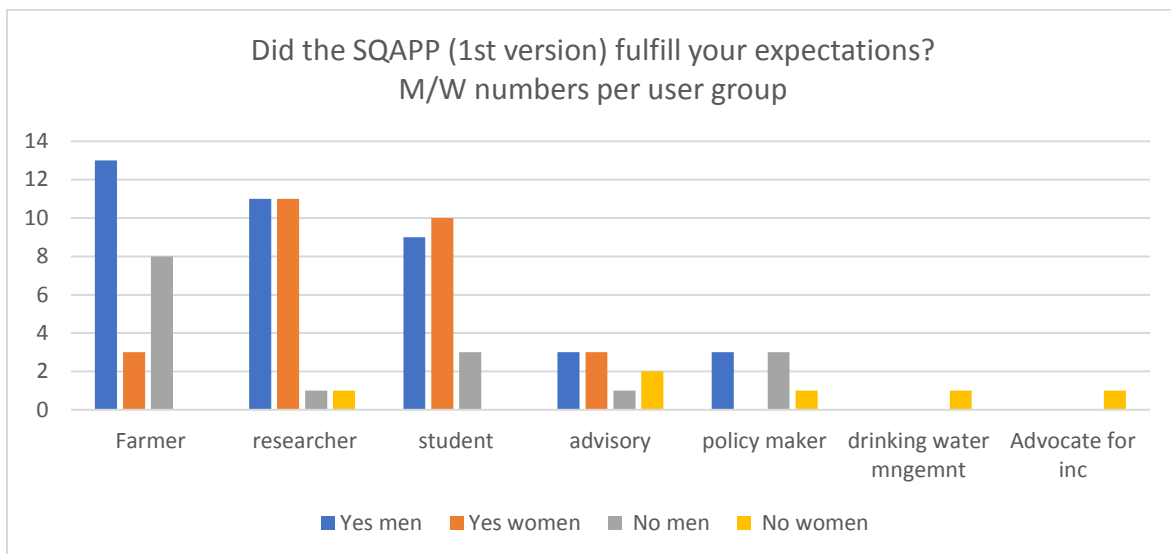
About the “**practices provided**”, the clarity (of the SQAPP text) is about 100% positive, women as well as men, also, about the “level of detail” both are mainly positive, women are a little more positive in percentage then men (respectively 84% and 75%).

About the fulfilment of the expectations, a majority of men and women say that the SQAPP fulfilled their expectations. In percentage women (82%) are a little more positive than men(71%) (table below).

Although more women had no specific expectations from the SQAPP than the ones who did before the test and after testing the SQAPP, more women (82%) and men (74%) did say that the SQAPP fulfilled their expectations, than the ones who say it didn't.



The 3 women that did have expectations from the SQAPP, but these were not fulfilled for them, (the “Yes, No” category) were two from advisory services, saying “the information is too theoretic, ask to give more practical advices which are actually usable for farmers and advisers”. This is in coherence with most of the farmers comments, they ask for more practical information, farm specific data, translation to the local language and more personification of the app. The other woman said: When starting at a plot it is OBLIGATORY to fill out the annual precipitation. And this data is not always at hand, therefore it is guesstimated or even just randomly filled-out. It would be good if SQAPP would use geo-located precipitation databases. She also says to “Indicate the sources/ databases for the Soil Properties and the Soil Threats”.



In summary the comments are:

- SQAPP info difficult for farmer use (from women advisors and men farmers)
- Questions on data reliability (from all men/women user groups)
- 82% women and 74% men respondents say that the SQAPP fulfilled their expectations

5. Qualitative SQAPP data farmers

The responds from the women farmers to the functioning of the SQAPP are being highlighted here, with some additional remarks from the farmer men (5.1), to this some additional qualitative data are added, which are the results from a separate SQAPP test research in Spain (5.2).

5.1 From the SQAPP feedback questionnaire

The three farmer women who responded to the questionnaire come from Slovenia, Spain and Portugal, they are all 3 between 30-50 years old. And the quoted farmer men are also between 30-50 years old.

All three women farmers said that about the proposed soil physical, chemical and biological properties, that they were relevant to very relevant to them. The Spanish farmer woman says she doesn't understand the meaning of the probability density functions, the other two say they do. The full range of values however make sense in the local context to all three of them. About the proposed soil threats, the wind erosion was irrelevant for the Spanish and the Polish, for the Slovenian in this context only the soil organic matter decline and the soil nutrient depletion are relevant.

The provided threshold values in the local context were all very meaningful for the Spanish farmer, but were not meaningful for the Slovenian, because she said, there is no soil water erosion in our land. The rest remained more or less unanswered. ("don't know", "no provided data"). All three mentioned the Soil properties chapter "good" and the potential for "Soil properties potential": "about right". All three are satisfied with the "proposed soil parameters needing attention" in terms of plausibility. In terms of ranking there is exception from the Slovenian farmer, explaining that: "We have the biggest problems with soil drought. water storage is only on 3rd place. In our opinion it should be on 1st."

All three women farmers say that the soil threat chapter is user friendly (good) and all are overall positive about the practices provided. For additional information all would like to know more experiences with the SQAPP. The suggested agricultural management practices are partly already implemented (by the Slovenian farmer 2 and the Polish farmer 6), the number of practices that are appropriate for the plot (are 3 for the Spanish, 3 for the Slovenian and 4 for the Polish farmer) and the practices they want to try (are 3 for the Spanish). All three farmers are satisfied with the recommendations in terms of suitability. In terms of innovation the Spanish farmer is satisfied, Biochar is a new practice for her that could be implemented; the Slovenian is partly satisfied, and the Polish farmer is not, saying that the recommendations are not new to her. Two of them would like to have an overview of the practices on a webpage, one prefers a video with the practices explained.

All three say the SQAPP fulfils their expectations. Whether the SQAPP would be a potential use for them as farmers, is supported by the Spanish ("for the soil chemical properties and the recommendations") and by the Slovenian ("for easier work, I do not have agricultural school, so a lot of the parameter are new to me, I didn't know they exist."), but not for the Polish farmer, she says the application is more suitable for technicians than for farmers with a lower education. Suggestions to make the SQAPP more useful for them: "Translate to Spanish" "Make possible to use as input to our own soil analysis, the app should also work on farm level" The information they normally gathered on the AMP's, comes from the website, experiences, agricultural advisors, suppliers of materials. Information on soil quality comes from expert opinions and laboratory assessments.

For the Polish farmer the SQAPP is not innovative, she says that "other apps in the market provide similar information." The Spanish farmer does find the SQAPP innovative and she learned from the recommendations. The Slovenian farmer also finds the SQAPP innovative, it is the first time she tests something like this app, she learned new practices and warnings on threats that she was not aware of.

-(farmer, man, Greece): *The app should include the management used in the study area;*

-(farmer, man, Portugal): *For large farmers the app does not provide much information. The units in cmol/kg are difficult to understand, it should provide more information about soil and plant quality and the yield. It should provide an over view (graphic) over the years about the soil quality improvement.*

-(farmer man, Portugal): *The interaction in the application is easy and simple. The app is an added value for partnering with private companies, Associations and Technicians.*

5.2 From the Albaida region research

Another source for looking at the gender diversity was a research on the SQAPP in Albaida region in Spain, adding some Spanish experiences with the SQAPP. A very informative data gathering from a combination of field tests, SQAPP results and interview with the farmers and advisors, 11 persons (9 men, 2 women). Through the interviews we know what practical ideas and obstacles every respondent has. Most of them say that the SQAPP is more useful for technicians, advisors, and one mentioned it to be more useful for an investor in land, but they like it anyhow.

Example (Woman, farm owner, interview after the SQAPP test and AMP recommendations)

Concerning the chemical soil properties given by the app, she agrees on the given values for her plot, and stresses that: The active lime content is a very important indicator for her that is not given, as it determines the degree of sequestration of nutrients by the soil. She explains: *"Due to the active limestone, many nutrients (P, N) may not be available for the plant, therefore, it is important to add the compost, as it brings nutrition and it improves the availability."*

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Her comments to the given practices:

- Compost application: *"Already in practice."*
- Minimum tillage: *"Already in practice. In fact, no tillage or ploughing of the land is applied besides the burying of the green cover"*.
- Avoidance of traffic and controlled traffic: *"Already in practice, machinery traffic on the wine vintage and input applications are considered unavoidable."*
- Chipped branches: *"Already in practice."*
- Straw mulch: Deeply interested on the measure, she asks the implications and the benefits of it and how it can be applied.
- Ridge-furrow systems: Considers it unfeasible in vineyards.
- Flood irrigation: Water is not available in the area.

Her opinion:

She advises that: *"Different cultivars should be an input of the app, since the recommendations given may not be useful for all."* And: *"The management system could also be an input, if one is practicing rainfed agriculture, transformation to irrigation may not be feasible where water is not available."* And says: *"The SQAPP offers a great source of information that could be used as a supplementary source besides soil analysis."*

-- (Farmer man, owner) *Restrictive fertilisation inputs are applied, pomegranate performs better when the plant suffers some nutrient and water stress at flowering stages. Inorganic fertilisers and manure are the preferred inputs. My farm is highly automated and I often rely on the use of apps to manage the irrigation schedule. Most likely, the use of apps to manage soils is to become more relevant. New farmers need more and more information provided of this kind to make decisions on best management practices*

-- (Farmer man, owner) *He advocates for the use of livestock as weed and vegetation control instead of herbicides. He would use information provided from the app carefully, contrasting with the local knowledge he gathers from its fields He stresses the importance of bridging the gap between science and society, however doubts that an app could be the optimal medium for it. Instead he proposes the figure of individuals acting as extension services*

-(Farmer man, worker) *Two or three sprays of glyphosate in the soil to control weeds. Unlikely to use the app, as the technicalities of soils are hardly interpretable. He says his farming practices are not dependant on soil information*

-(Farmer man, land manager) *Fertirrigation applied through the common irrigation system. Soil sprayed with glyphosate two or three times a year. Trees sprayed yearly with pre emergency fungicides and pesticides; Tillage of the soil once every two years ("puncturing the soil").*

Advice: Minimum and no tillage; Respond: *"Tillage is only done once every two years."*

Advice: Avoidance of traffic and controlled traffic; Respond: *"Traffic is necessary to carry out pulverization works, harvesting, fertilising and pruning (crushing the prunings). Unlikely to reduce it more, (compaction is desirable for better machinery traffic). - Availability of soil information is important, however, his management is limited to the main tasks given by the technician. The technician, argues, would benefit more from this information, as he does the fertilisation plans."*

-(farmer, man, manager) *He is very interested to know "how is the farm performing in terms of biological soil indicators."*

- (farmer, man, land worker) *"soil is becoming a more important subject on farming, so far the only parameter to look at was the plant health status "*

(Woman, advisor) *"Technicians, however, do understand and translate soil data to farmers. In that sense, the app could be of much more use for them."*

Conclusions:

- The women farmers that tested the SQAPP for the evaluation are generally positive about the SQAPP and are open to learn from the information it gives.
- The men farmers are positive and negative about the SQAPP, positive are about the additional use to existing data information, several farmers state however, that the application is more suitable for advisors and technicians who are able to interpret the data and act upon it.
- In summary, the application is diversely considered as: "a great source of information" which "may be useful to make right decisions".

6. Conclusions gender equality and diversity

1. Gender disaggregated data useful for insight in -and approach to- equality and diversity
2. Ordinal responds show a few gender significant responds; women see more relevance
3. SQAPP test users m/w are positive, women in % a little more on fulfilled expectations;
4. The SQAPP is considered “easy to use, appropriate for educated farmers, advisors, technicians
5. Farmers are curious about the proposed AMP’s, see the SQAPP as a supplementary source

Ad 1. In the 3rd reporting period the iSQAPER staff had 174 people, 84 men and 81 women. Considering equality in numbers, well balanced. 78% of this staff is academic and 43 % of the academic staff is a woman, 55 in number, reasonably balanced. Of the 22% “Other staff” 74% is woman, 26 in number.

Among the SQAPP test stakeholders there were 55 men (62%) and 32 women (36%) and 2 who preferred not to say their gender. The diversity is researched in the stakeholder responds to the SQAPP tests.

Ad 2. From the stakeholder SQAPP test questionnaire in the third project period, the test for gender related responds, results in a significance on the opinion about “How relevant are the **proposed soil threats** within the local context for “Soil biodiversity” and for “soil acidification”, among all responds.

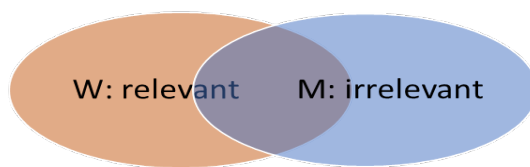


Figure 2: proposed soil threat: soil biodiversity/acidification;

When differentiating the answers from the researchers and the advisors only, a significance shows on the: “How relevant are the proposed **biological soil properties**, concerning the: *Estimated soil microbial abundance.*” And for the researchers only, a significance showed upon the question: “How relevant are the **proposed soil threats** within the local context? On Soil organic matter decline and on Soil nutrient depletion,” women researchers find it in the mentioned questions “very relevant” to “relevant” and the men find it “relevant” to “irrelevant”

Except from these significances from the outcomes, there is no other clue why women would find this soil biodiversity and soil acidification more relevant as a proposed soil threat than men. The involved women do not mention the subjects specifically in the remarks, and, although these probability tests on significance are there to exclude coincidence, that is also still a possibility. On the other hand, these are some differences that might be due to gender related interests and helpful to widen our scope to the needs of the stakeholders and the solutions that we are looking for. The significant subjects may be interesting for further investigation towards gender related interests.

Ad 3. A majority of men and women say that the SQAPP fulfilled their expectations. In percentage women (82%) are a little more positive than men(71%). They expected information on soil quality from the SQAPP. This was covered satisfactory according to both m/w from different user groups.

Ad 4/5. These conclusions refer to the gender disaggregated qualitative farmer quotes in chapter 5.

7. Recommendations and follow up

1. Organize information sessions for farmers to adapt sustainable practices
2. Continue finetuning the app making use by gender disaggregated information
3. The SQAPP might be more appropriate for use by advisors and researchers, if the farmer is not educated. But, if the farmer understands the app, she or he could use the app to compare the advice and draw his or her own conclusion about the soil management approach. Therefore demonstration and information sessions for both men and women farmers are advised.

More recommendations from women:

- Explain data reliability, collection, AMP's and their costs (policy maker)
- Farming practices are deeply rooted in farmers beliefs. A modification of the practices would imply a -much harder to achieve- change of behaviour and mindset. (advisor)
- If the source of data would be highly reliable, then she would propose map connection with GERKs, so we could find plots for farmers quickly and advise them faster with the use of this app. This could then maybe count also for controlling purposes. (advisor)
- The advice: "Conversion from arable land to forest", is often impossible to follow-up for land users. It could be phrased differently, e.g. "Plant more trees that [specific characteristics] that help soil health in this plot." (advisor SLM)

More recommendations from men:

- Use country specific units/thresholds for red/yellow/green (policy maker)
- Include costs vs. improved production (farmer)
- It would be useful that the user could add that he is doing some of the treatments and for how long time and then see how results could change with this (Policy maker)
- Farmer is *"Very interested to know how is the farm performing in terms of biological soil indicators"*
- And one farmer said: *"I have convinced far more people in the bar about a sustainable practice than any organised formative session"*.

Follow up

- For the final reporting period the study sites are being asked for more gender disaggregated data to be gathered at the demonstration meetings, this will be qualitative data to be analysed for the gender diversity in needs for improvement.
- For China we will look at the SQAPP expectations from the 1st data gathering and, when the SQAPP launch with the Chinese data would be on time for testing, we will ask the disaggregated data as well to be analysed.
- The gender information gathered will be used for policy related recommendations

References

- (CDE 2019) D5.1 Stakeholder feedback to soil quality assessment app WP4 – UNIBE, CDE Abdallah Alaoui & Tatenda Lemann, iSQAPER EU project, 2018/2019
- (WUR 2018) Evaluation of the Soil Quality App of the Greater Albaida Region, Spain; P. van den Berg e.a. TEMPR, WUR-UMH 2018, iSQAPER EU project

Annex 1: institute staff numbers and tasks

3rd project period (May 2018- May 2019) compared to 2nd project period (Oct 2011-May 2018)

ISQAPER	2019	W acade- mic staff	M academi c staff	W othr staff	M othr staff	W total	to 18' + / -	M tot	to'18' + / -	Total M+W	total +/-
1. WU	NI	4	5			4	1	5		9	1
2. JRC	It/H								-1		-1
3. FIBL	Swi	3	1		1	3		2	-1	5	-1
4. UNIBE	Swi	1	2			1		2		3	
5. UE	Por	1	3			1		3	2	4	2
6. UPM	Sp	2	5	3		5		5		10	
7. IEEP	UK, B	5	4			5		4		9	
8. MEDES	It	4	1			4	-1	1		5	-1
9. ISRIC	NI	1	4			1		4	-1	5	-1
	NI										
10. DLO	DLO	2	3			2		3	-2	5	-2
11. IA	Pol	1	2			1	-1	2	-2	3	-3
12. IAES	Esto	2	4	2		4	-1	4		8	-1
13. UL	Slov	3	5	2	1	5	3	6	2	11	5
14. ICPA	Ro	8		10		18	7	0	-1	18	6
15. ESAC	Por	2	1			2		1		3	
16. UMH	Sp	2	2			2	-1	2		4	-1
17. AUA	Gr	1	3		1	1	-1	4	1	5	
18. IARRP	Ch	6	10	1		7	-4	10	-2	17	-6
19. ISWC	Ch '18	1	6			1		6		7	
20. SFI SAAS	Ch	2	5			2	-1	5	-1	7	-2
21. Corepage	NI	1				1				1	
22. BothEnds	NI			3	2	3	1	2		5	1
23. UP	Hu	3	4	4	4	7	3	8	4	15	7
24. ISS	Ch		3				-3	3	-3	3	-6
25. GB	Fr			1	1	1		1		2	
		55	73	26	10	81	2	83	-5	164	-3
to 2018		-9	-8	11	3	79	2	88		167	

Annex 2a: Significance tests gender in stakeholder responds

Mann-Whitney U Test All user groups

Test Statistics^a

	How relevant are the proposed soil threats within the local context? [Soil salinization]	How relevant are the proposed soil threats within the local context? [Soil organic matter decline]	How relevant are the proposed soil threats within the local context? [Soil nutrient depletion*]	How relevant are the proposed soil threats within the local context? [Soil acidification]	How relevant are the proposed soil threats within the local context? [Soil contamination*]
Mann-Whitney U	477.500	533.500	509.500	505.000	407.000
Wilcoxon W	912.500	1479.500	887.500	940.000	758.000
Z	-1.162	-.994	-.636	-2.151	-.949
Asymp. Sig. (2-tailed)	.245	.320	.525	.031	.343

Test Statistics^a

	How relevant are the proposed soil threats within the local context? [Soil biodiversity]	Are the threshold values meaningful in the local context? [Soil erosion by water]	Are the threshold values meaningful in the local context? [Soil erosion by wind]	Are the threshold values meaningful in the local context? [Soil compaction]	Are the threshold values meaningful in the local context? [Soil salinization]
Mann-Whitney U	210.500	457.500	257.000	332.000	502.500
Wilcoxon W	441.500	733.500	692.000	542.000	827.500
Z	-2.051	-.038	-.097	-.723	-.313
Asymp. Sig. (2-tailed)	.040	.970	.923	.470	.754

Annex 2b: Significance tests gender responds researchers, advisors

Mann-Whitney U Test Researchers

Test Statistics^a

	How relevant are the proposed soil threats within the local context? [Soil salinization]	How relevant are the proposed soil threats within the local context? [Soil organic matter decline]	How relevant are the proposed soil threats within the local context? [Soil nutrient depletion*]	How relevant are the proposed soil threats within the local context? [Soil acidification]
Mann-Whitney U	38.000	28.000	26.500	42.500
Wilcoxon W	104.000	94.000	92.500	108.500
Z	-1.581	-2.764	-2.339	-1.311
Asymp. Sig. (2-tailed)	.114	.006	.019	.190
Exact Sig. [2*(1-tailed Sig.)]	.151 ^b	.019 ^b	.043 ^b	.243 ^b

Mann-Whitney U Test Advisors and Researchers

Test Statistics^a

	How relevant are the proposed biological soil properties? [Estimated soil microbial abundance]	How relevant are the proposed biological soil properties? [Macrofauna groups]	Did you understand the meaning of the probability density functions?	Did the full range of values make sense to you within the local context?
Mann-Whitney U	27.000	34.500	92.000	104.000
Wilcoxon W	147.000	154.500	228.000	240.000
Z	-2.305	-1.768	-1.458	-1.013
Asymp. Sig. (2-tailed)	.021	.077	.145	.311
Exact Sig. [2*(1-tailed Sig.)]	.034 ^b	.101 ^b	.184 ^b	.381 ^b