



MedArtSal

Sustainable Management Model for Mediterranean Artisanal Salinas

Deliverable Activity A.3.2.1

Salinas Sustainability Index

Analysis and Proposal for an effective SSI

Activity period: 05/11/2020 – 04/06/2023
Partner in charge: UCA
Partners involved: all
Status: final
Distribution: public

Contents

1	Background.....	2
1.1	Introduction.....	2
1.2	Purpose of the report.....	2
2	SSI process construction.....	5
3	Selection of variables.....	7
3.1	Scale for the variables.....	13
3.2	Weighting of variables.....	16
4	Index construction.....	21
4.1	Construction of sub-indices.....	21
5	Preliminary results and assessment of the MedArtSal Salinas.....	22
5.1	Salinas Self-evaluation- SSI TOOLKIT.....	24
6	NEXT STEPS.....	26
	References.....	27



1 Background

1.1 Introduction

One of the main objectives of the MEDARTSAL project is the creation of a sustainability model for Coastal Artisanal Salinas in Mediterranean countries. Once developed, it will provide indices to compare the different Salinas in terms of salt production & economic management, environmental management & conservation and development of innovative & diversified activities. The joint use of these indices will allow the sustainability of artisanal Salinas in the Mediterranean to be assessed, highlighting their strengths and identifying their weaknesses. The results could be used to determine appropriate improvements in the activities of the Salinas.

The term "sustainable development" is first coined in an official document in the text of the agreement signed by thirty-three African countries in 1969, under the auspices of the International Union for Conservation of Nature (IUCN).

There are numerous definitions of the concept of sustainability, but they all converge towards the same idea, which can be summarized as «Sustainability is the development that meets the needs of the present without compromising the capacity of future generations, guaranteeing the balance between economic growth, protecting the environment and social well-being».

In the context of the MedArtSal project, a sustainable Salina would be one that uses natural resources to obtain economic income, but in a socially and environmentally respectful way, ensuring the future use of resources.

1.2 Purpose of the report

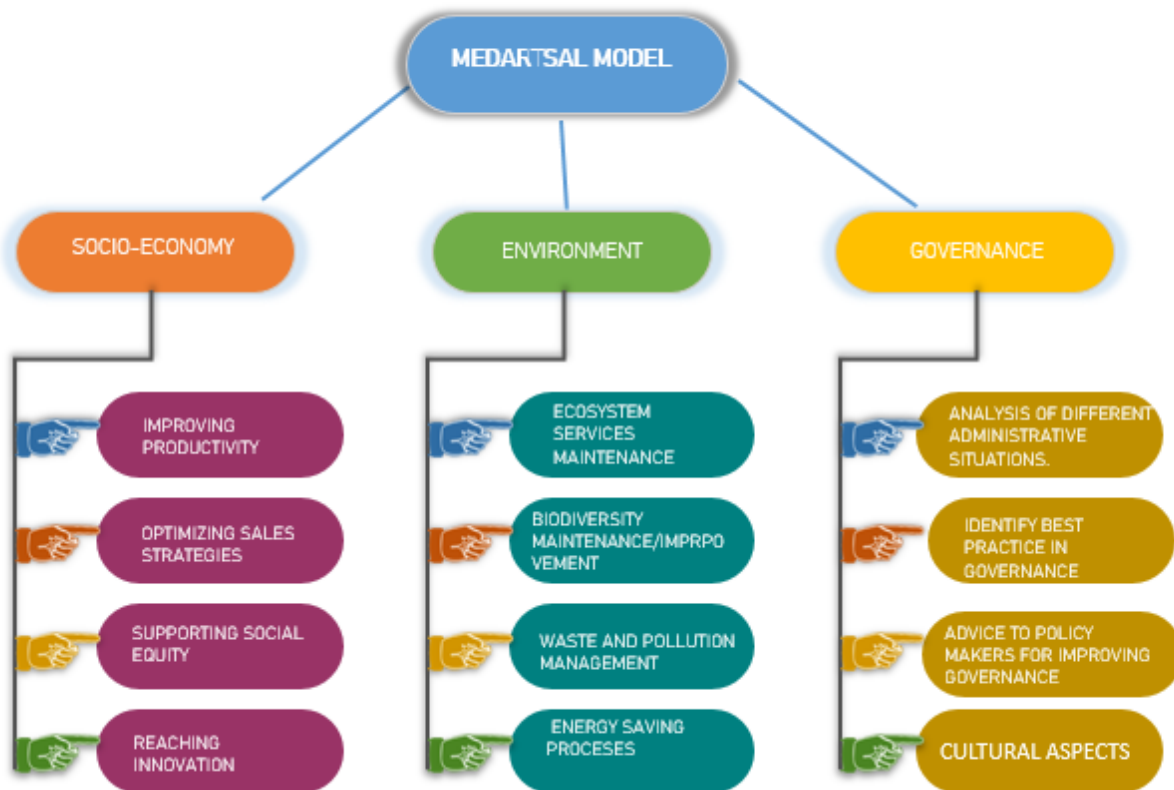
One of the main objectives of the MedArtSal project is to create a MODEL FOR SUSTAINABLE DEVELOPMENT OF THE ARTISANAL SALINAS which is aimed at fostering local economic development of Salinas through sustainable salt production and development of new products and services, preserving their environmental and cultural values. The model will help to identify gaps in the sustainability of artisanal Salinas throughout the Mediterranean area and offer individual solutions that can be easily applied, taking into account future scenarios.

The creation of a model aimed at simplifying the explanation of environmental heterogeneity and the relationships among its variables is always a challenge. Although the model developed will never explain 100% of the system variability, such models are widely used in research to help us understand the most probable



scenarios or make reliable predictions of future changes. (Halpern *et al.*, 2012; Mori and Christodoulou, 2012). In this case, the model will be a multispectral complex model as it has to take into account economic, social, cultural, management and governance variables. Due to this complexity, a mixed model integrating quantitative as well as qualitative aspects will be developed.

MEDARTSAL: MULTIESPECTRAL COMPLEX MODEL



All this complexity will be analysed using QUANTITATIVE tools such as the [SALINAS SUSTAINABILITY INDEX](#) and QUALITATIVE tools through benchmarking analysis.



This report refers to the quantitative part of the model, with particular reference to the methodology used for the definition of the Salinas Sustainable Index (SSI). Please refer to the report “Building MedArtSal Model” for a complete overview of the objectives and elements of the model.



2 SSI process construction

The methodology used for the definition of the SSI, agreed among the partners in this research, was determined after a bibliographic analysis and review and was based on the following studies: the sensitivity index of seabirds to oil spills (Birdlife International, 2019, www.seo.org) and the determination of priority conservation indices (Arponen, 2012; Souza Silva *et al.*, 2014).

Salina Sustainability Index (SSI) includes quantitative aspects (variables) that can be easily measured by the Salina owners or by other users. The value of each variable can be given considering the current situation/status or by considering future scenarios, according to planned or provisional activities aimed at improving the sustainability of the Salinas. The SSI does not include certain aspects of the model since the SSI was created mainly as a tool for the Salina owners to assess their own sustainability and identify which aspect(s) can be improved. The final model, however, will include an analysis of the best solutions for governance and other aspects (see report on Building MedArtSal Model).

SALINAS SUSTAINABILITY INDEX (SSI) = EASILY MEASURABLE VARIABLES THAT THE SALINA OWNER CAN SCORE AND CAN CHANGE TO ASSESS/FORESEE IMPROVEMENTS TO SALINA SUSTAINABILITY.

MEDARTSAL FINAL MODEL= SSI + OTHER QUALITATIVE ASPECTS SUCH AS GOVERNANCE, MARKETING, BENCHMARKING ANALYSES...

The SSI has been developed such that it can be used as an overall SSI (taking into account all variables) but can also be employed in separate sub-indexes, which can provide information on specific aspects of the Salinas:

- **GLOBAL SSI**: including the entire set of selected variables related to socio-economic, environmental or diversification aspects.
- **Socio-economic sub-index**: considering all relevant selected variables which provide information on economy and society.
- **Environmental sub-index**: considering all relevant selected variables which provide information on biodiversity conservation and environmental protection.
- **Diversification/Innovation** (understanding diversification as an aspect of innovation in the Salinas) sub-index: considering all relevant selected variables which provide information on the new products, techniques, methodologies and any type of diversification or innovation activities.



The SSI was developed in several steps (as shown in the following figure) with the participation of all project partners.

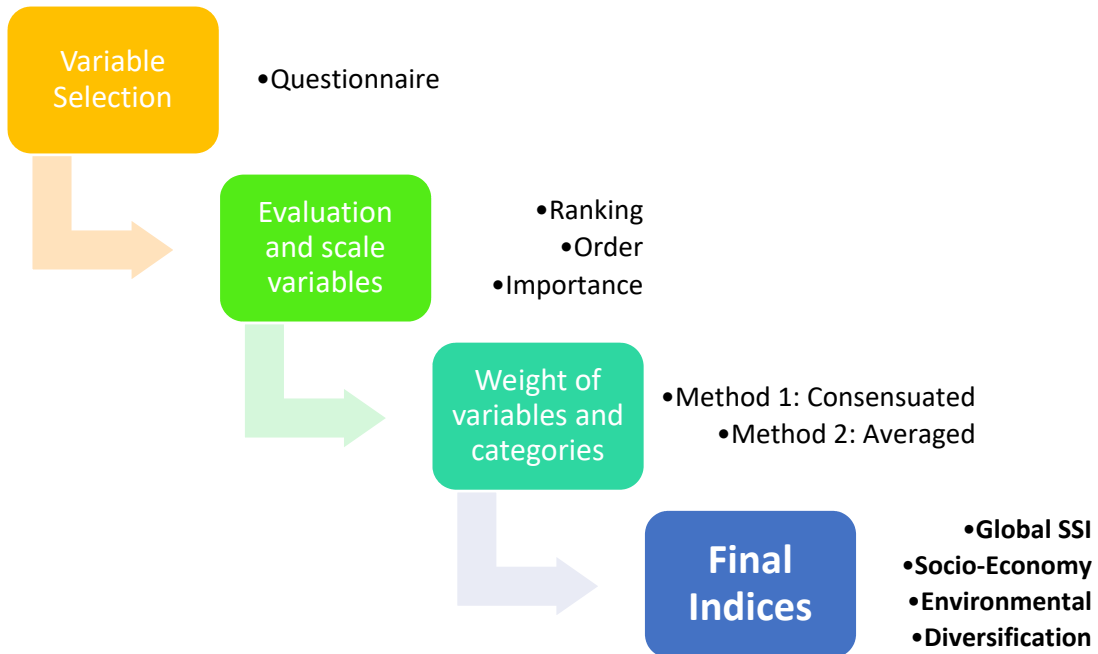


Figure 1. Scheme for creating the Salinas Sustainability Index (SSI)



$$Salina\ Sustainability\ Index\ (SSI) = \sum_1^n Var_n * Weight_n$$

Figure 2. Salinas Sustainability Index (SSI) - snapshot



3 Selection of variables

The basic information and the variables to be used for the creation of these indices were obtained through a survey (agreed with all the project partners), which was sent to the salt producers of the Mediterranean countries. The English version of the survey can be found in <https://d138.uca.es/encuesta-medartsal-english/>.

It should be noted that there are only a relatively small number of artisanal Salinas in the Mediterranean area. The total number of artisanal Salinas identified with certainty was 37. Out of all the surveys sent out, only 21 responses were received, which is 56.7% of the total (10 more Salinas also responded but these were extensive Salinas or mines). Nevertheless, the information collected can be considered sufficient to build a robust first draft of the Salina Sustainability Index. Moreover, the data could be integrated with future information from other potential responses to the survey and from pilot activities under development in the two pilot cases of La Esperanza and Saida Salinas, as well as foreseen sub-grants and related activities.

After evaluating each of the 22 questions in the survey with the aid of different experts in environmental economics, marketing, conservation and Salinas management, we selected those that provided simple information that was comparable among different saltworks.

In general, the simplest variables were used, giving the option of more direct comparison between the different Salinas. The proposed variables for inclusion in the different indices are detailed in Table 1.

Table 1. Variables considered for the construction of the artisanal Salinas sustainability index

#	Variable	Answer unit
01	Productive area (hectare)	Area
02	Commercial areas in the Salina	Packaging facilities
		Shop area
		Other
03	Annual total main productivity	Quantity
04	Salina Effectiveness	Prod/ha
05	Fleur de sel production	Quantity
06	Salina profitability 2019	% profit
07	Customer type	Local shop in Salina
		Local
		National
		International (Mediterranean countries)
08	Commercial supply chain	International (worldwide)
		Retail
		HoReCa
		Wholesale
		On Line
09	Sales strategy	International broker
		Other
10	Employment gender ratio	Individual
		Associated
11	Risk prevention at work	% ratio
12	Employees per total main productivity	Yes or Not
13	Tourism activity	Employees/Quantity
		Ecotourism
		Cultural
		Gastro
		Educative
14	European Salina Network	Other
		Yes or No
15	Number of secondary products	Nº of products
16	Innovation activities	Yes or No
17	Special areas within the Salina	Storage
		Evaporation
		Crystallization
		Other salt treatment

Table 1 (Cont.). Variables considered for the construction of the artisanal Salinas sustainability index

#	Variable	Answer unit
18	Is the Salina inside a Natural Protected Area? What type of Natural Protected Area?	Local Regional National International
19	Biodiversity monitoring	Birds Flora Fish Other
20	Salina environmental educational program	Yes or No
21	Waste, pollution, noise control measures and energy plan	Yes or No
22	Conservation plan: Number of actions to improve biodiversity with some costs	Nº of actions

Descriptions of the selected variables are given below to facilitate understanding:

- 01. Productive area (hectare):** We selected this variable considering size to be a measure of economic sustainability, the productive area of the Salina being essential to carry out the economic activity.
- 02. Commercial areas in the Salina:** The number of different commercial areas, such as packaging, washing, storage areas, etc. can affect the costs to the salt producer once the salt has been harvested, which is why the existence of commercial areas is considered an economic benefit. If the Salina has different areas or facilities to complete the productive chain, the secondary costs are reduced and therefore profitability increased.
- 03. Total annual main productivity:** Determining the amount of salt produced annually will be key to evaluating the sustainability of the Salina, a large total production of salt being valued positively.
- 04. Effectiveness of the Salina:** The effectiveness of the Salina is calculated as the number of tons of salt produced per hectare of productive area. This variable provides an indication of the efficiency of the Salina, allowing the owner to determine whether productivity can be improved or not.
- 05. Fleur de sel production:** Fleur de sel has become one of the 'star products' of gourmet salts, generating profits for producers of this type of salt. For this reason, we have included the production of this type of salt as a positive element in the salt industry. Fleur de sel is the main product of the gourmet salt market worldwide (sales accounting for 30% of the total market and this percentage is increasing year on year). The production of fleur de sel in the artisanal Salina would increase the profitability of the Salinas.



06. **Salina profitability 2019:** The profitability of the Salina is undoubtedly the key factor underlying economic sustainability. The inclusion of this variable is fundamental to the creation of the sustainability index, greater profitability being evaluated positively.
07. **Customer type:** Expanding the number or type of customers can lead to increased revenue. For this reason, sales of salt in international markets are valued more positively, followed by national and finally local markets.
08. **Commercial supply chain:** It will be essential to find different avenues for reaching these customers in order to increase sales. In this regard, the existence of several different commercial channels is valued positively. The availability of different commercial channels is an asset if one or other of them fails. Hence, a greater number of commercial channels implies higher profitability and sustainability.
09. **Sales strategy:** Experience tells us that there is strength in numbers. Examples from other primary sectors, such as the association of small farmers, winegrowers, and even salt producers in cooperatives, suggest that there are substantial benefits to be gained by such alliances in terms of product sales. Thus, a positive score is given to those Salinas that sell their product via such alliances.
10. **Employment gender ratio:** Gender parity among workers in the Salina is valued positively in terms of social sustainability of the Salina activity. A "model" Salina must take into account gender equality.
11. **Risk prevention at work:** Safety at work is a fundamental aspect of the working environment. The existence of a risk prevention plan is valued positively.
12. **Employee productivity:** The effectiveness and efficiency of the workers can tip the balance towards positive company performance or towards economic losses if not optimized. In the case of the Salina we consider a lower number of employees per tons produced to be positive.
13. **Tourism activity:** Secondary activities within the Salina can provide substantial extra turnover in some cases. Among such activities, tourism, especially ecotourism, gastronomic or cultural tourism, can be an important source of income for the salt producer. In this regard, a more prominent presence of tourism related activities within the Salina is positively valued.
14. **Salina Network.** The fact that a Salina forms part of an extensive collaborative network can favour its growth, relationships and therefore profitability. Forming part of such a network is valued positively.
15. **Number of secondary products:** Diversifying the offer of secondary products provided by the Salina will expand the business potentiality for markets and consumers, and therefore will increase profitability. For this reason, the offer of a larger number of secondary products within the Salina is valued positively.
16. **Innovation activities:** Similarly, the offer of new, different, attractive products, methodologies and process can lead to greater visibility and new markets to be exploited in the salt industry. A positive score is given to those Salinas that implement innovative products/activities.



17. **Special areas within the Salina:** Those Salinas that have a pit area with crystallizers, an area of evaporators and heaters, a water circulation stream together with areas of accumulation of water and spillways will provide a variety of different habitats of great value for birds. In this regard, the presence of more special areas within the Salina is valued positively..
18. **Is the Salina within a Natural Protected Area?** What type? If the Salina is within a protected natural space, it will possess the ecological values which make that area worthy of this protected status. For this reason, the location of the Salina within a protected natural area is valued positively. Moreover, since there are different categories within protected natural areas, those spaces with an international conservation category are valued more positively, followed by national, regional and finally local protected natural areas.
19. **Biodiversity monitoring:** The monitoring of fauna, flora or other organisms within the Salina will provide valuable environmental information for the area in which the saline is located. Thus, carrying out different types of monitoring in the Salina is valued positively. This variable also reveals the degree of environmental commitment of the owner.
20. **Salina environmental educational program:** This variable values the existence of environmental educational activities and is therefore, considered within the environmental category since we consider that it would help promote awareness of environmental conservation. In this regard, the existence of some type of environmental/socio-environmental education associated with the Salina is valued positively. This variable also reveals the degree of environmental commitment of the owner.
21. **Waste, pollution, noise control measures and energy plan:** These plans should be part of the roadmap of any company concerned with the environment, so the existence of such plans (or at least some of them) is considered positively.
22. **Conservation plan:** Finally, investment by the Salina owner in actions that benefit biodiversity or the conservation of the environment is considered positively. Furthermore, this variable also provides an indication of the commitment of the owner to nature preservation.

The overall Salina sustainability index (SSI) will consist of all the variables shown in Table 1, whereas each of the proposed sub-indices (Socio-economic, environmental and diversification) will only include those variables corresponding to each category (Table 2) in accordance with the nature of the variable.

Table 2. Variables considered for the construction of the different sub-indexes of artisanal Salinas sustainability: Socio-economic, Environmental and Diversification

Variables Global SSI	Variables Socio-economic index	Variables Environmental Index	Variables Diversification index
Productive area (hectares)	Included		
Commercial areas in the Salina	Included		
Annual total main productivity	Included		
Salina Effectiveness	Included		
Fleur de sel production	Included		
Salina profitability 2019	Included		
Customer type	Included		Included
Commercial supply chain	Included		Included
Sales strategy	Included		
Gender ratio employment	Included		
Risk prevention at work	Included		
Employees per total main productivity	Included		
Tourism activity	Included		Included
European Salina Network	Included		
Number of secondary products	Included		Included
Innovation activities	Included		Included
Special areas within the Salina		Included	
Is the Salina inside a Natural Protected Area? What type?		Included	
Biodiversity monitoring		Included	
Salina environmental educational program		Included	Included
Waste, pollution, noise control measures and energy plan		Included	
Conservation plan: Number of actions with some costs		Included	



3.1 Scale for the variables

The scale for rating the selected variables should be designed such that all the Salinas are evaluated in a similar way. Hence, in this first draft, the survey responses completed by the participating Salinas were used. These survey responses were used specifically to set the upper and lower limits of each variable. Based on the different ranges and categories of the responses and according to expert criteria, the scale for each variable was defined from 0 (no value) to 3 (maximum value). To avoid over or underestimations, those Salinas that present extreme values or 'outliers' were considered within the minimum or maximum values of the 0-3 scale that encompasses the common range of responses obtained. The scale and evaluation used for each variable is shown in Table 3.

As an example, to evaluate the variable 'Profitability of the Salina in 2019', 0 points were awarded if profitability was not attained in the last year, 1 point if a profitability between 1-10% was obtained, 2 points if profitability was between 11-30%, 3 points if the profitability was higher than 30%.

To evaluate the different commercial areas present in the Salina, 0 points are awarded if there are no commercial areas, 1 point if there is one commercial area, 2 points if it has 2 commercial areas and 3 points if it has 3 or more commercial areas.

In the case of variables with binary responses ('yes or no'), the responses were evaluated by awarding 0 points when the answer was negative and 3 points for affirmative answers.



Table 3. Evaluation of the selected variables

Variable	Rank	Answer unit
Productive area (hectares)	0	no productive area
	1	up to 1 ha productive area
	2	up to 2 ha productive area
	3	more than 2 ha productive area
Commercial areas in the Salina	0	no commercial areas
	1	1 commercial area
	2	2 commercial areas
	3	more than 2 commercial areas
Annual total main productivity	0	no production yet
	1	1-100 tn salt production
	2	101-299 tn salt production
	3	more than 300 tn salt production
Salina Effectiveness	0	0 tn per ha
	1	1-100 tn per ha
	2	101-300 tn per ha
	3	more than 300 tn per ha
Fleur de sel production	0	no fleur de sel production
	1	1-2 tn fleur de sel production
	2	3-5 tn fleur de sel production
	3	more than 6 tn fleur de sel production
Salina profitability 2019	0	no profit yet
	1	1-10% profit
	2	11-30% profit
	3	more than 30% profit
Customer type	0	not sold
	1	local (shop+local town)
	2	national
	3	international
Commercial supply chain	0	not sold
	1	1 commercial channel
	2	2 commercial channels
	3	more than 2 commercial channels
Sales strategy	0	individual
	3	associated
Gender ratio employment	1	only one gender working
	2	Mostly men or women, but both gender working
	3	50% each gender working

Table 3 (Cont.). Evaluation of the selected variables

Variable	Rank	Answer unit
Risk prevention at work	0	No risk prevention plan
	3	Risk prevention plan
Employees per total main productivity ¹	0	>50%
	1	15%-50%
	2	5%-15%
	3	<5%
Tourism activity	0	no tourism activities
	1	1 tourism activity
	2	2 tourism activities
	3	more than 2 tourism activities
European Salina Network	0	does not belong to any network
	3	part of a network
Number of secondary products	0	no secondary products
	1	1 secondary product
	2	2 secondary products
	3	more than 2 secondary products
Innovation activities	0	no innovation activities
	3	some innovation activities
Special areas within the Salina	0	no special areas
	1	1 special area
	2	2 special areas
	3	more than 2 special areas
Is the Salina inside a Natural Protected Area? What type?	0	no protected area
	1	local and regional protected park
	2	national protected park
	3	international protected park
Biodiversity monitoring	0	no biomonitoring
	1	1 group species monitoring
	2	2 groups species monitoring
	3	more than 2 groups species monitoring
Salina environmental educational program	0	no free educational program
	3	free educational program
Waste, pollution, noise control measures and energy plan	0	does not have any plan
	3	implemented plan
Conservation plan: Number of actions for improving biodiversity with some costs	0	no conservation actions
	1	1 conservation action
	2	2 conservation actions
	3	more than 2 conservation actions

¹ To calculate this value, the salt owner must divide the number of employees who work in the Salina by the number of tonnes of production and multiply it by 100.



3.2 Weighting of variables

Once the variables have been selected and scaled, the weighting of each one will determine their influence within the index. Taking into account the total number of variables considered in the global SSI and the category to which each of them could be assigned within each sub-index (socio-economic, environmental or diversification), it was established that the sustainability index could reflect the reality of the world of salt in accordance with the following proportions:

SSI (100%): SOCIECONOMIC (50%) + ENVIRONMENT (30%) + DIVERSIFICATION (20%)

This general weight was established taking into account different perceptions among experts of the different partners from environmental, economic and academic organizations as well as the owner of a Salina.

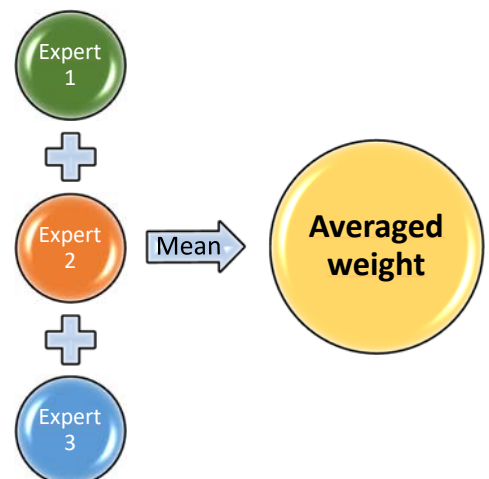
Two different methodologies were applied to define the weight of each variable considered for the global SSI as well as for each of the sub-indices..

- The **first methodology** consisted of applying a single weight agreed by the group of experts to each variable in each of the four proposed indices.



Consensual weights

- The **second methodology** consisted of each expert involved judging the specific weight of each variable for each of the proposed indices, then calculating the average weight for each variable.





To facilitate the presentation of the results and to make them more understandable, the weighting of the variables has been adjusted to a 100-point scale. This weighting is detailed in Table 4.



Table 4. Weighting of the selected variables classified in the Socio-economic, environmental and diversification categories

Variables	Method1				Method2			
	Global SSI	Socio-economic Index	Environmental Index	Diversification Index	Global SSI	Socio-economic Index	Environmental Index	Diversification Index
Salina Effectiveness	7.50	7.50			9.57	13.00		
2019 salina profitability	7.50	7.50			7.86	11.86		
Annual total main productivity	7.50	7.50			8.00	10.86		
Number of secondary products	6.00			6.00	7.14	8.71		23.86
Number of actions for biodiversity (implies some cost)	5.40		5.40					
Biodiversity monitoring	5.10		5.10		4.57		15.29	
Special areas within the Salina	5.10		5.10		5.71		19.00	
Economic Tourism activity (Profit)	4.50	4.50			4.43	6.71		
Fleur de sel production	4.50	4.50			6.14	8.14		
Innovation activities	4.40			4.40	5.43	7.71		17.86
Commercial supply chain	4.00	4.00			4.43	5.43		13.21
Innovative Tourism activity (number)	4.00			4.00				17.86
Productive area (hectare)	4.00	4.00			4.00	5.43		
Customer type	4.00	4.00			4.14	5.00		12.21
Waste, pollution, noise control measures & energy plan	3.60		3.60		4.71		20.71	
What type of Natural Protected Area?	3.60		3.60		3.43		12.00	



Project funded by the
EUROPEAN UNION



REGIONE AUTONOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA

Salina Sustainability Index (SSI)

January 4th 2021-FINAL





Table 4 (Cont.). Weighting of the selected variables classified in the SOCIOECONOMIC, ENVIRONMENTAL AND DIVERSIFICATION categories

Variables	Method1				Method2			
	Global SSI	Socio-economic Index	Environmental Index	Diversification Index	Global SSI	Socio-economic Index	Environmental Index	Diversification Index
Conservation action plan	3.60		3.60		6.57		25.00	
Salina environmental educational program	3.60		3.60		1.86		8.00	8.57
Commercial areas in the Salina	2.50	2.50			3.29	4.86		
Sales strategy	2.00	2.00			3.43	5.29		
Innovation Customer type	2.00			2.00				
Innovation Commercial supply chain	2.00			2.00				
Are you included in any European Salina Networking	1.60			1.60	1.14	2.29		6.43
Number of employees per total main productivity	1.00	1.00			1.57	2.00		
Gender ratio employment	0.50	0.50			1.29	1.29		
Risk prevention at work	0.50	0.50			1.29	1.43		



4 Index construction

Once the valuations of each variable have been agreed upon and their weight established, the sustainability index for the Mediterranean Salinas can be constructed by adding each variable according to its weighting factor through the following formula:

$$\text{Salina Sustainability Index (SSI)} = \sum_{1}^{n} \text{Var}_n * \text{Weight}_n$$

Using this formula, the sustainability index for each Salina can be calculated in a standardized way and compared with that for other Mediterranean Salinas which provided information through the surveys. To better understand the index, the different scores for the Salinas can be extrapolated to a scale of 0 to 10, where 0 indicates low sustainability and 10 indicates high sustainability.

4.1 Construction of sub-indices

As stated above, according to the nature of the selected SSI variables they are classified as socioeconomic, environmental or diversification. This allows us to construct independent sub-indices, each corresponding to a specific character or sector/theme, i.e. Socio-economic index, Environmental Index, Diversification index. Thus, the calculation of these sub-indices will provide an indication of the weakest sector/theme of the Salina compared to the others, allowing this weakness to be taken into account in the design of future strategies to improve the sustainability of the Salina.

$$\text{Socio – Economic index (SEI)} = \sum_{1}^{n} \text{VarSE}_n$$

$$\text{Environmental index (EI)} = \sum_{1}^{n} \text{VarE}_n$$

$$\text{Diversification Index (DI)} = \sum_{1}^{n} \text{VarD}_n$$



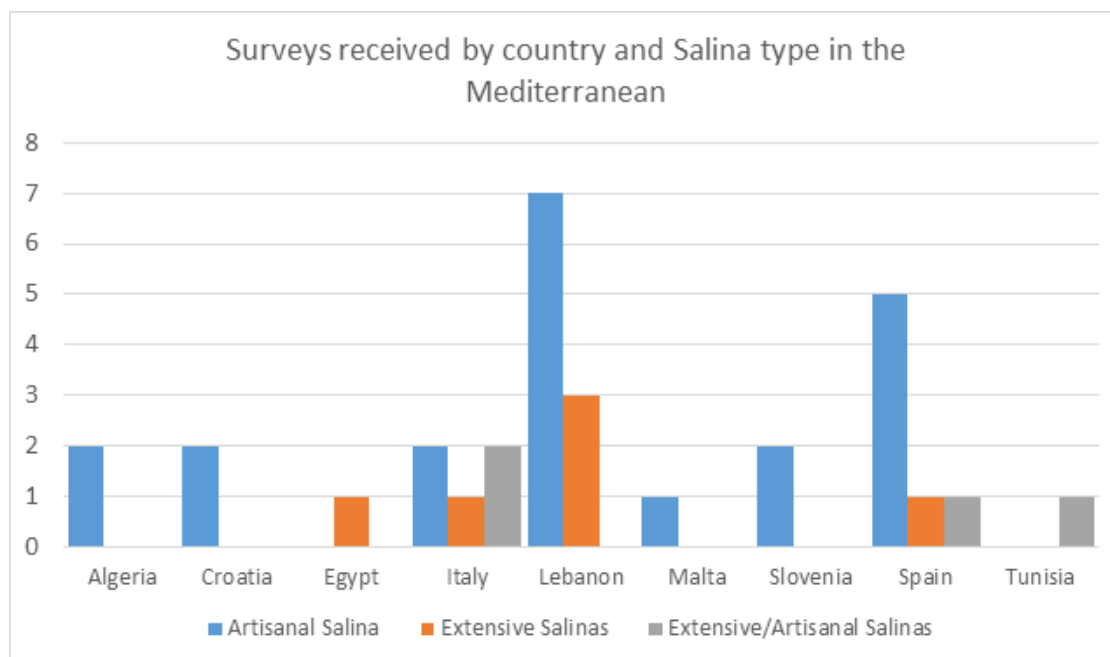
5 Results and assessment of the MedArtSal Salinas

In previous sections, we have defined sustainability as activity that does not compromise the future of the Salina. However, given the impossibility of establishing a fixed, immovable criterion of sustainability in the Salinas, according to which a Salina is either sustainable or unsustainable, we consider that the index developed here to measure the present and future activity could serve as a means to compare the Mediterranean Salinas to each other in terms of sustainability. In other words, a more sustainable Salina will present a higher sustainability percentage in accordance with the index, although we cannot currently establish a specific percentage below which the Salina would not be considered sustainable.

As previously mentioned, a total of 37 potential artisanal Salinas were identified in the Mediterranean that fell within the study area. Information about the project was sent to all of these Salinas together with the aforementioned survey (<https://d138.uca.es/encuesta-medartsal-english>) translated into all the languages of the participating countries. In the first stage, the expected responses were not received. Finally, a total of 31 completed surveys were received, of which 21 were from artisanal Salinas. Seven extensive Salinas and one salt mine also responded. Therefore, the index constructed in this document is based on the 21 artisanal Salinas that participated by completing the survey.

The countries represented in these surveys and the number of Salinas which responded are in Figure 2.

Figure 2. Total number of surveys received per collaborating country and type of production.





After applying the two different methodologies to evaluate the degree of sustainability of the artisanal Salinas that responded to the survey, we can state that there are no major differences between these methodologies, and that each of the Salinas obtained similar results under each approach. When ordering the Salinas according their SSI values under both methodologies, the first four positions are occupied by the same salinas, and in the same order. The last two positions also correspond to the same Salinas under both methodologies (Table 5).

Hence, despite minor differences, both methodologies can be useful and appropriate for evaluating the sustainability of artisanal Salinas in the Mediterranean.

Table 5. Comparison of the order of the Salinas from most to least sustainable under the two methodologies evaluated.

	Method 1	Method 2
Salina #1	57.96%	51.27%
Salina #2	71.91%	63.61%
Salina #3	63.55%	56.21%
Salina #4	33.61%	29.73%
Salina #5	29.20%	25.83%
Salina #6	49.94%	44.17%
Salina #7	17.96%	15.89%
Salina #8	52.53%	46.47%
Salina #9	34.40%	30.43%
Salina #10	36.89%	32.63%
Salina #11	50.90%	45.02%
Salina #12	46.77%	41.37%
Salina #13	40.33%	35.68%
Salina #14	32.42%	28.68%
Salina #15	11.07%	9.79%
Salina #16	85.18%	75.35%
Salina #17	57.28%	50.67%
Salina #18	66.71%	59.01%
Salina #19	65.70%	58.11%
Salina #20	65.41%	57.86%
Salina #21	35.70%	31.58%



5.1 Salinas Self-evaluation- SSI TOOLKIT

Based on the 4 independent indices and on the evaluation table for the considered variables (Table 2), a self-evaluation tool (SSI Toolkit) for artisanal Salinas has been developed. The toolkit can be used by any worker in the salt sector. By entering the required information (i.e. values for the 22 SSI variables) in relation to the Salina, an SSI score can be obtained and therefore an assessment of the sustainability status of the Salina. A preliminary draft of this toolkit can be found at this [link](#).



MedArtSal Toolkit Test

Dear salt producer, with the following self-assessment questionnaire you will be able to know the sustainability status of your Salina. After completing the question, press 'View score'.

- 0-25 Not very sustainable
- 26-50 Something sustainable
- 51-75 Fairly sustainable
- 76-99 Very sustainable

Here we need to set the hyperlink with instruction and guidelines in national language.
shorturl.at/zWX56 (empty example)

Thank you very much!

***Obligatorio**

Note, however, that this toolkit is under construction and further improvements may be necessary.

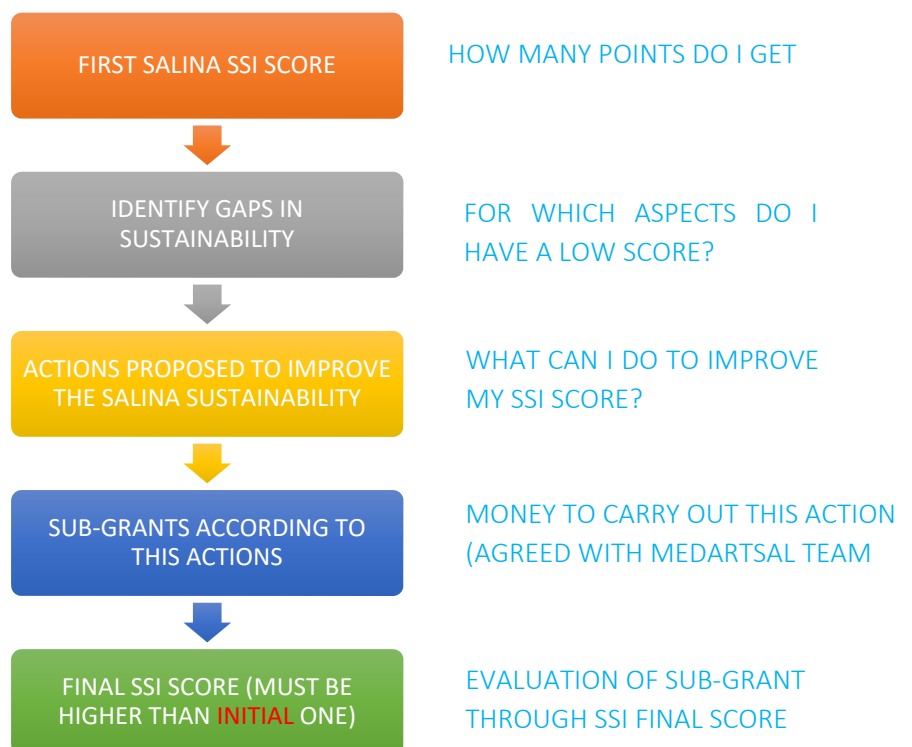


6 NEXT STEPS

The Salinas Sustainability Index, as previously stated, is conceived as a quantitative tool to perform an initial assessment of Salina sustainability. It has been developed as a quantitative tool that could provide a reliable measurement of sustainability of the Salinas. The next step of the SSI is to help evaluate the “before and after” score for sub-granted Salinas in the context of WP4.

The Salina owners will be able to determine a score for their Salina, identify gaps in sustainability and take measures to improve this score by carrying out some of the actions proposed in the toolkit. Sub-grants will be offered according to this SSI improvement and the planned actions

SSI: A TOOL FOR SUB-GRANTS



References

- Arponen, A. 2012. Prioritizing species for conservation planning. *Biodiversity and Conservation*, 21: 875–893. <http://link.springer.com/10.1007/s10531-012-0242-1>.
- Birdlife International. 2019. Mapping bird sensitivity to marine oil pollution.
- Halpern, B. S., Longo, C., Hardy, D., McLeod, K. L., Samhuri, J. F., Katona, S. K., Kleisner, K., *et al.* 2012. An index to assess the health and benefits of the global ocean. *Nature*, 488: 615–620. Nature Publishing Group. <http://www.ncbi.nlm.nih.gov/pubmed/22895186>.
- Mori, K., and Christodoulou, A. 2012. Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI). *Environmental Impact Assessment Review*, 32: 94–106. Elsevier Inc. <http://dx.doi.org/10.1016/j.eiar.2011.06.001>.
- Souza Silva, M., Martins, R. P., and Ferreira, R. L. 2014. Cave Conservation Priority Index to Adopt a Rapid Protection Strategy: A Case Study in Brazilian Atlantic Rain Forest. *Environmental Management*, 55: 279–295.