Interreg Co-funded by the European Union

NEXT Black Sea Basin

Carbon Binding Blue Black Sea 2025

JULY

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1.Overview

Seabeds are important marine habitats with functions such as carbon sequestration, supporting biodiversity, and improving water quality in coastal ecosystems. However, in Turkey, regulations regarding the protection of seabeds are limited, and they are not adequately considered in Environmental Impact Assessment (EIA) processes. The aim of this study is to evaluate the current perceptions and views on the integration of seabeds into EIA processes and to measure public awareness.

Public Opinion Survey on Seagrasses - Methodology

3.1. Research Objective and Scope

The main objective of this research is to determine the **knowledge levels, awareness, and perceptions** of stakeholders living in regions located on the Marmara Sea coast regarding **seagrasses**. The study aims to reveal the public's current attitudes towards the conservation of seagrasses and sustainable coastal management.

3.2. Research Model

This study is a **survey model** conducted within the scope of quantitative research methods. The model aims to reveal the current attitudes and awareness levels of different stakeholder groups using a **descriptive** approach.

3.3. Research Partnership and Field Process

The research was conducted in cooperation with **Tekirdağ Namık Kemal University**. The field process lasted approximately **1.5 months**, during which the questionnaire was administered through both face-to-face field interviews and in a meeting format with public institutions. The study areas and target groups were determined with scientific consultancy support from the University.

3.4. Study Areas and Stakeholders

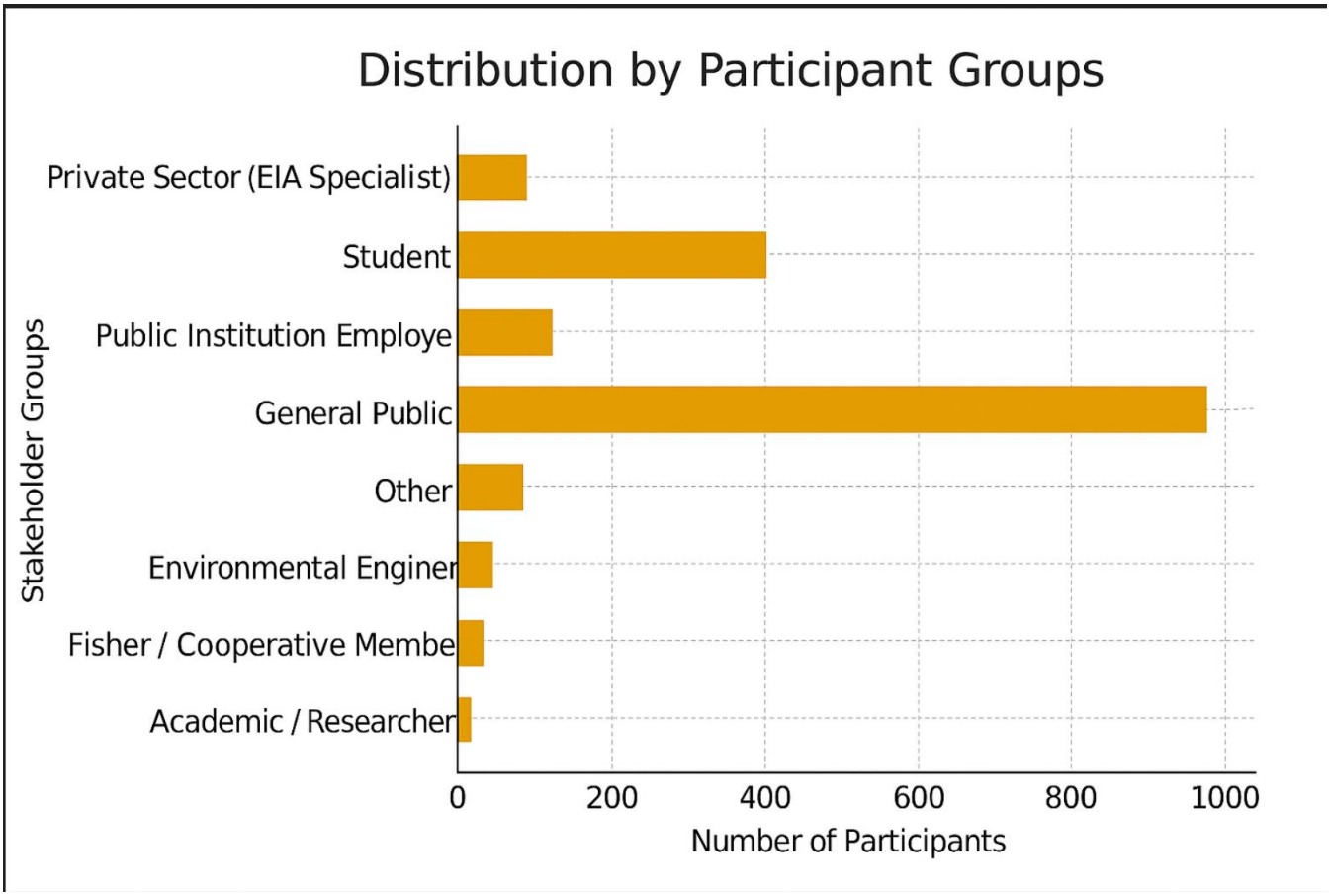
The study areas were determined considering the potential for seagrass distribution and regional interaction. Interviews were conducted with the following institutions and stakeholders:

1. Kıyıköy and İğneada Fishermen’s Cooperatives and fishermen
2. Tekirdağ, Kıyıköy, İğneada Port Authority Directorates

3. Tekirdağ Provincial Directorate of Environment, Urbanization, and Climate Change
4. Kırklareli Provincial Directorate of Environment, Urbanization, and Climate Change
5. DSİ (State Hydraulic Works) Edirne Regional Directorate
6. Municipalities of Tekirdağ, Kırklareli, Kıyıköy, and İğneada
7. The public of Tekirdağ, Kırklareli, Kıyıköy, and İğneada
8. Coast Guard Commands (Tekirdağ, Kıyıköy, İğneada)
9. Namık Kemal University, Department of Environmental Engineering
10. Namık Kemal University, Department of Maritime and Port Management (Vocational School of Social Sciences)

3.5. Population and Sample

The population of the research consists of stakeholder groups that are directly or indirectly related to marine ecosystems on the Marmara Sea coast. Since it was not possible to reach the entire population, the **purposive sampling** method was used. A total of **1,572** participants were interviewed.



3.6. Data Collection Tool and Application Method

An **online survey form** was used as the data collection tool. The questionnaire was administered face-to-face via a **tablet** and completed using the **distribute-collect** method during meetings held with public employees.

3.7. Data Analysis

The collected data were analyzed using the **SPSS** program. **Descriptive statistics** (frequency, percentage, mean, standard deviation) were utilized in the analysis. Furthermore, difference analyses (e.g., t-test, ANOVA) were performed according to stakeholder groups.

3.8. Ethical Principles

Throughout the research process, attention was paid to the principles of **voluntariness, confidentiality, and anonymity**. The purpose of the research was explained to the participants, and **informed consent** was obtained. The research was carried out in accordance with the ethical principles of Tekirdağ Namık Kemal University.

2. METHOD

This study is made of two sections:

2.1 Analysis of the Legislation:

- The EIA Regulation which is currently in effect in Turkey, and the national legislations about Coastal Law and Biodiversity have been examined.
- The existence and binding nature of the open references regarding seabeds have been analysed.

2.2 Survey Conduction:

- Participant Profile: 141 Participants (Government officials)
- Method: Online and in-person surveys
- Survey Sections: Awareness, Level of Knowledge, Perception of Legislation, Priority of Protection

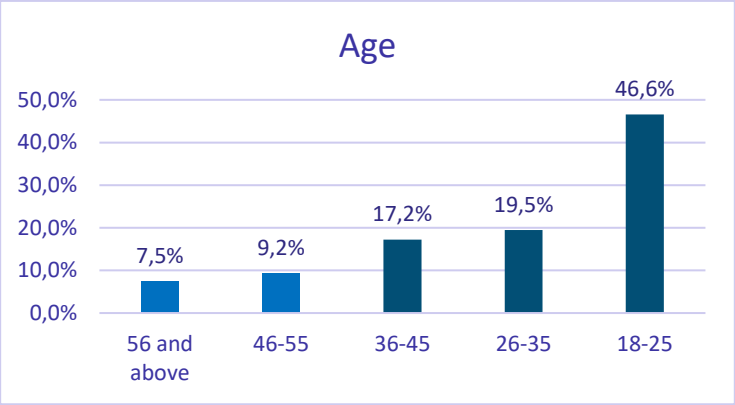
3. FINDINGS

3.1 Legislation Analysis Findings:

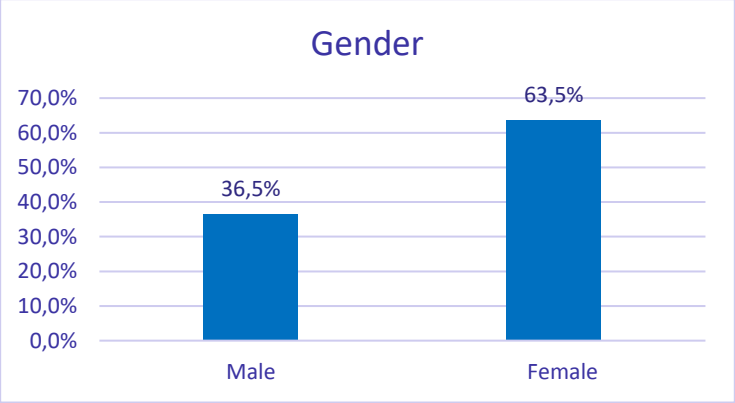
- Seabeds are indirectly regarded as wetlands and sensitive ecosystems in the EIA Regulations, but aren't defined explicitely.
- It has been observed that the awareness regarding seabeds is being overlooked in EIA processes regarding coastal urbanizations.
- Training should be arranged as required to inform the public on this matter.
- The importance of seabeds regarding carbon emissions should be emphasized more.

3.2 Survey Results :

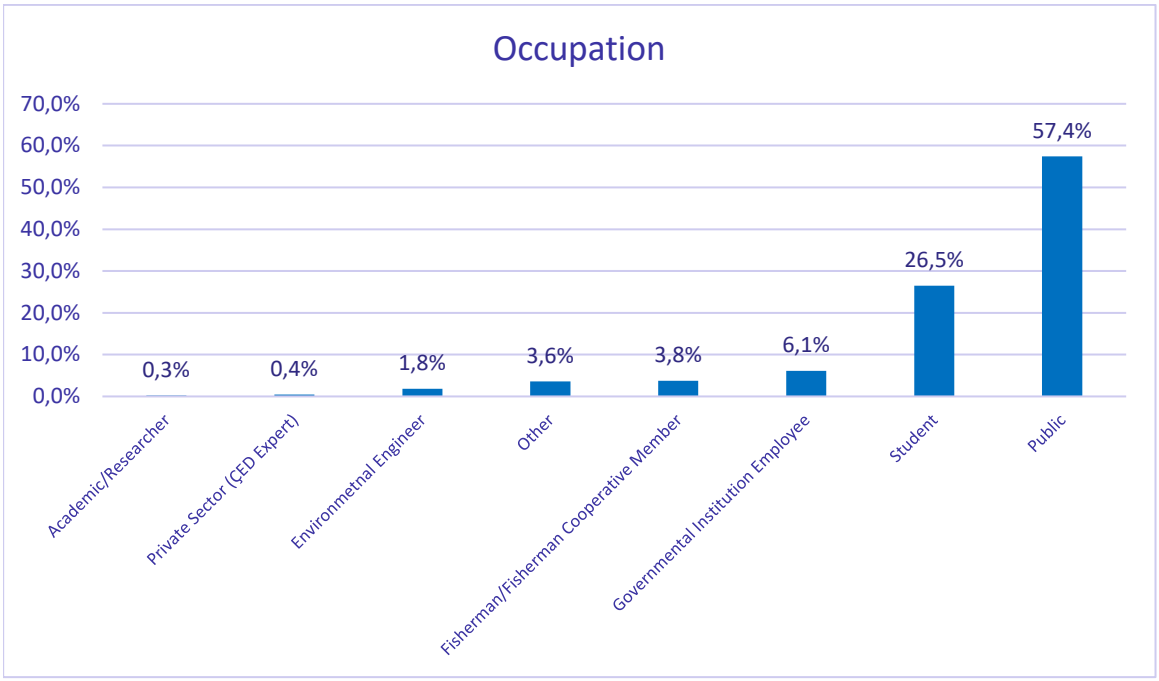
DEMOGRAPHICS



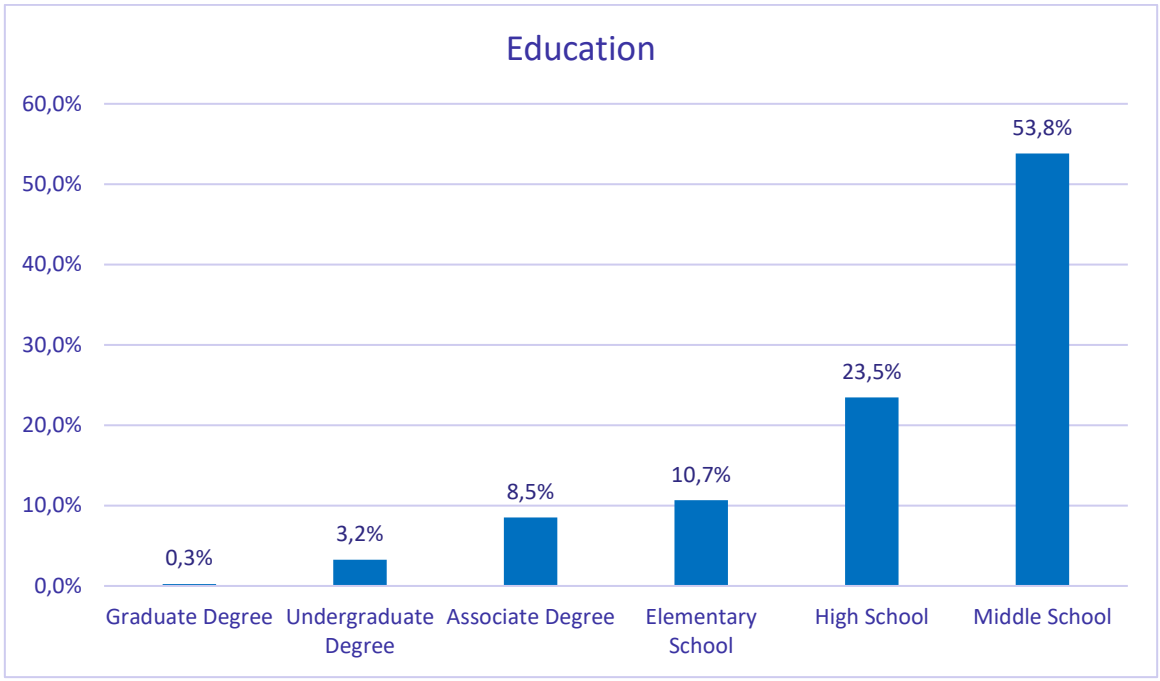
n =1572 **Average Age: 31,95**



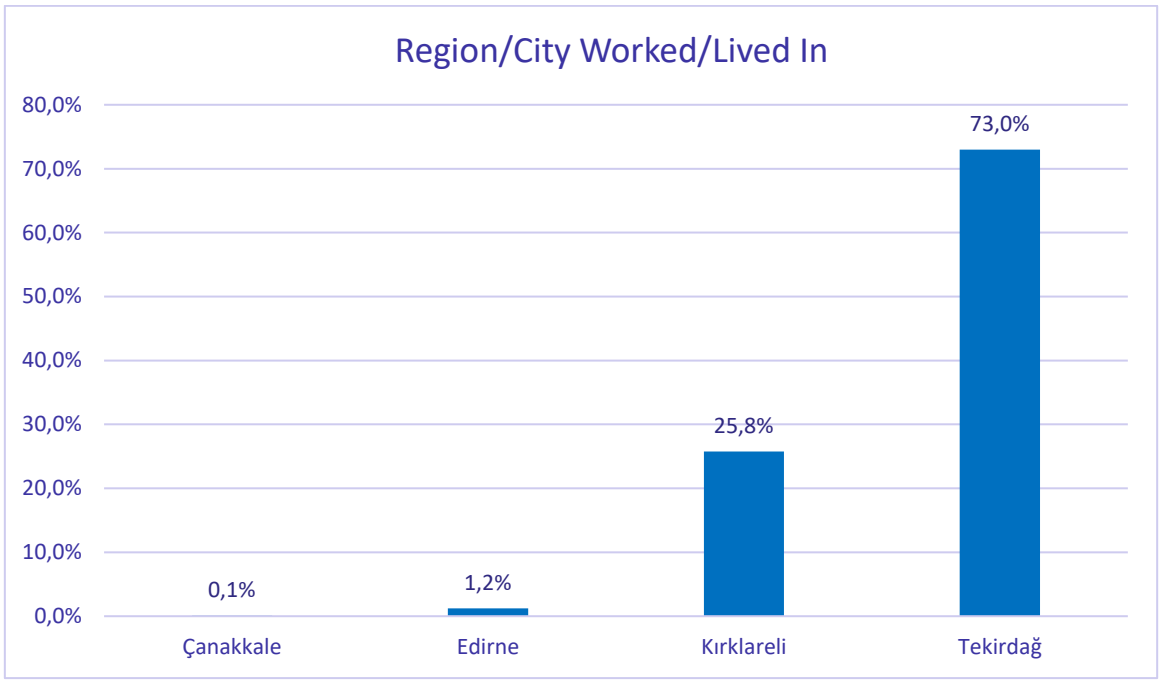
n =1572


Occupation
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
0,3%
0,4%
1,8%
3,6%
3,8%
6,1%
26,5%
57,4%
Academic/Researcher
Private Sector (ÇED Expert)
Environmetnal Engineer
Other
Fisherman/Fisherman Cooperative Member
Governmental Institution Employee
Student
Public

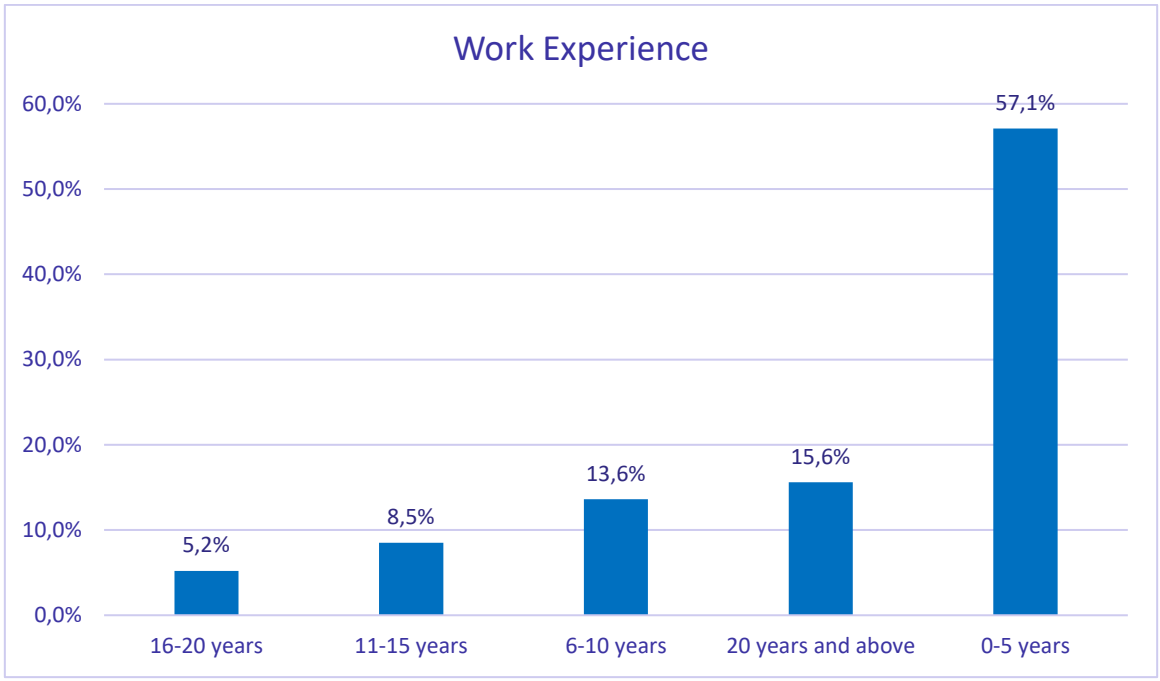
n=1572



n=1572

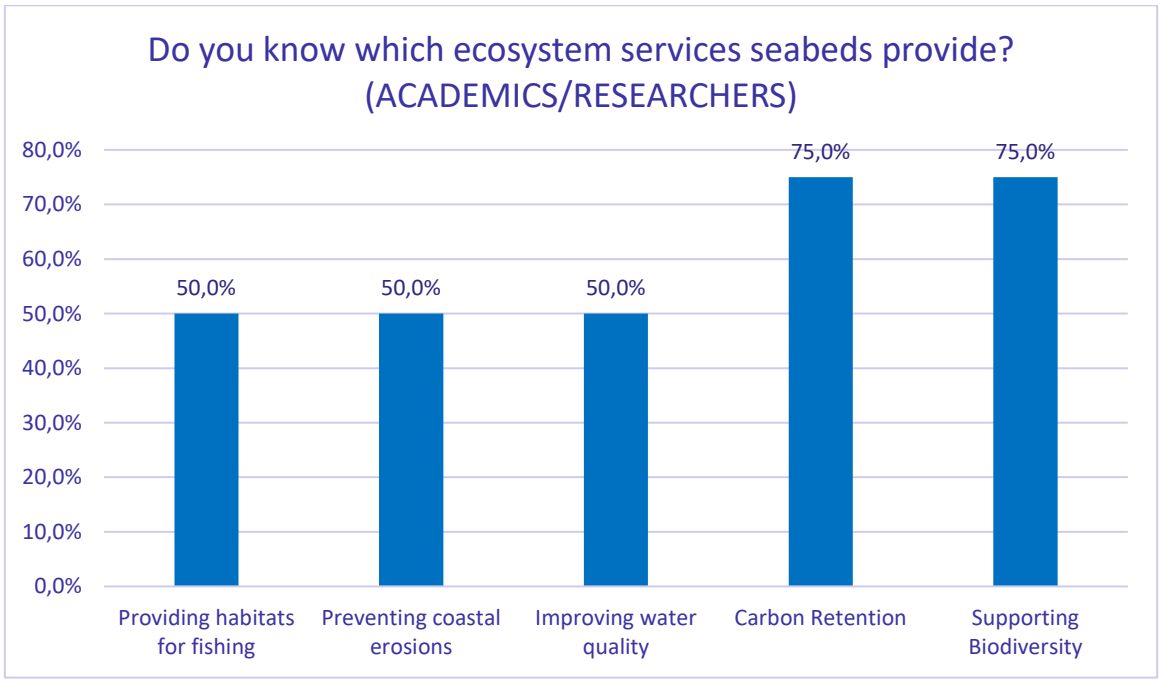


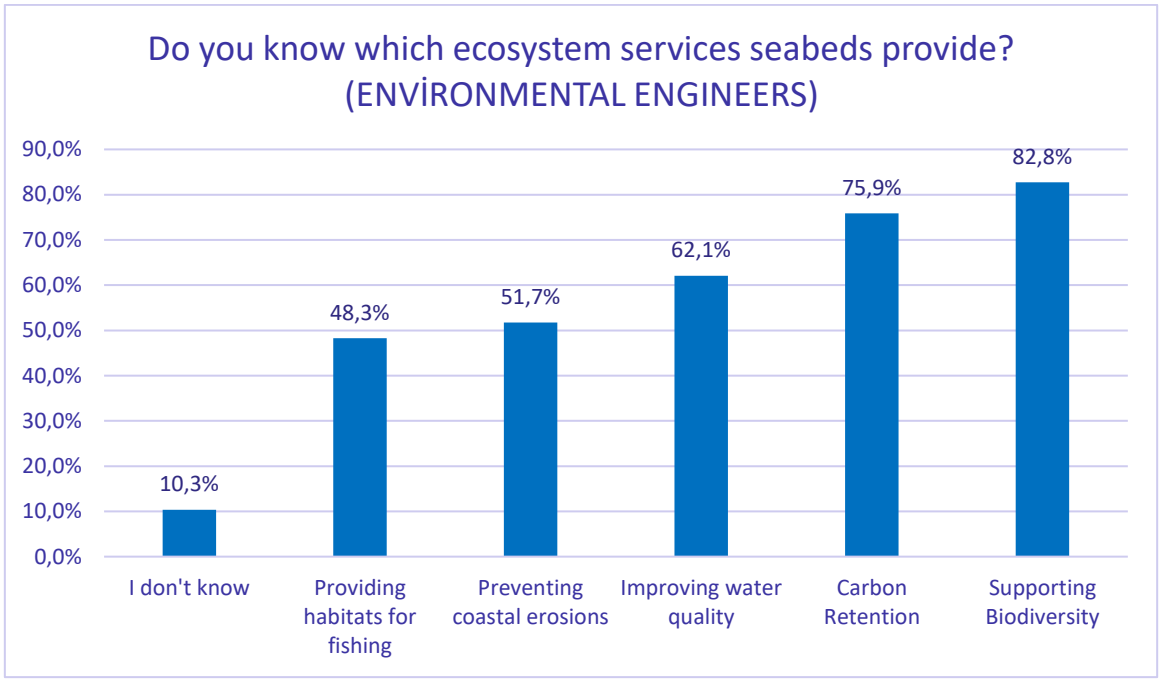
With n=1572 %73, participants from Tekirdağ have been surveyed the most.

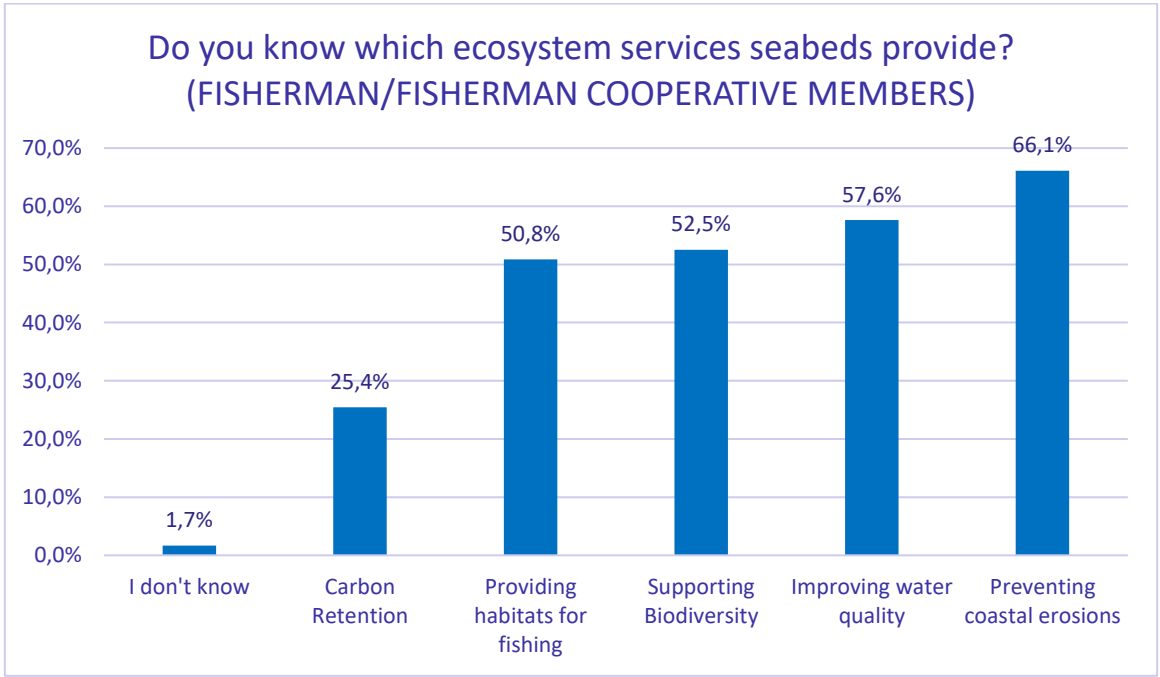


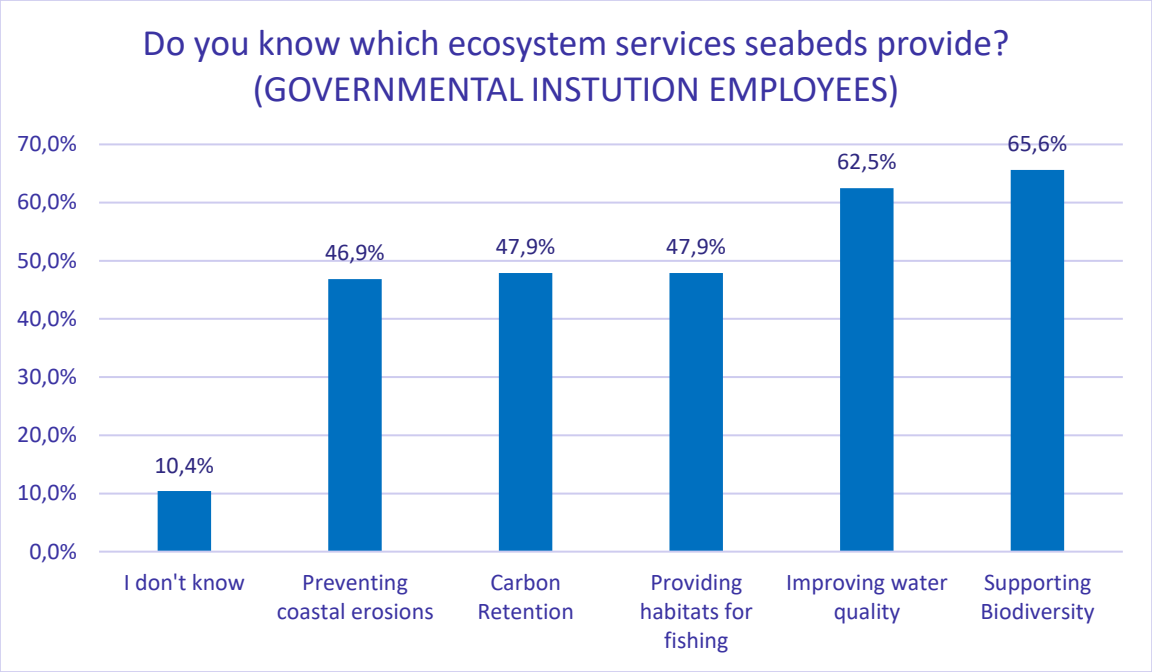
n=1572

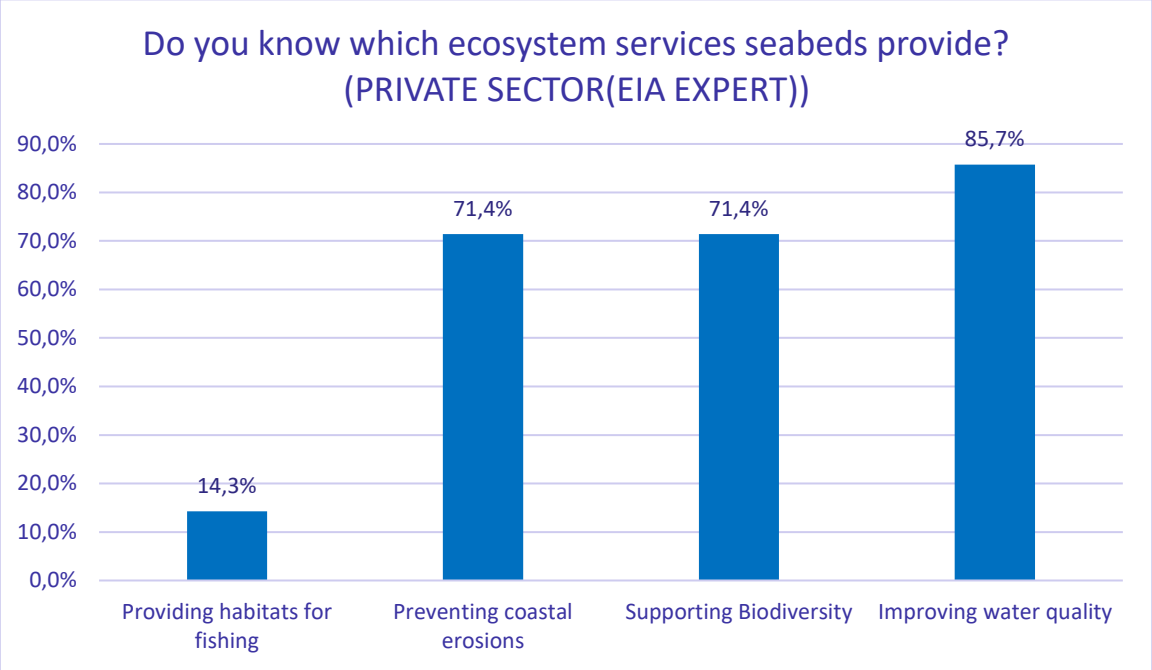
LEVEL OF KNOWLEDGE REGARDING SEABEDS

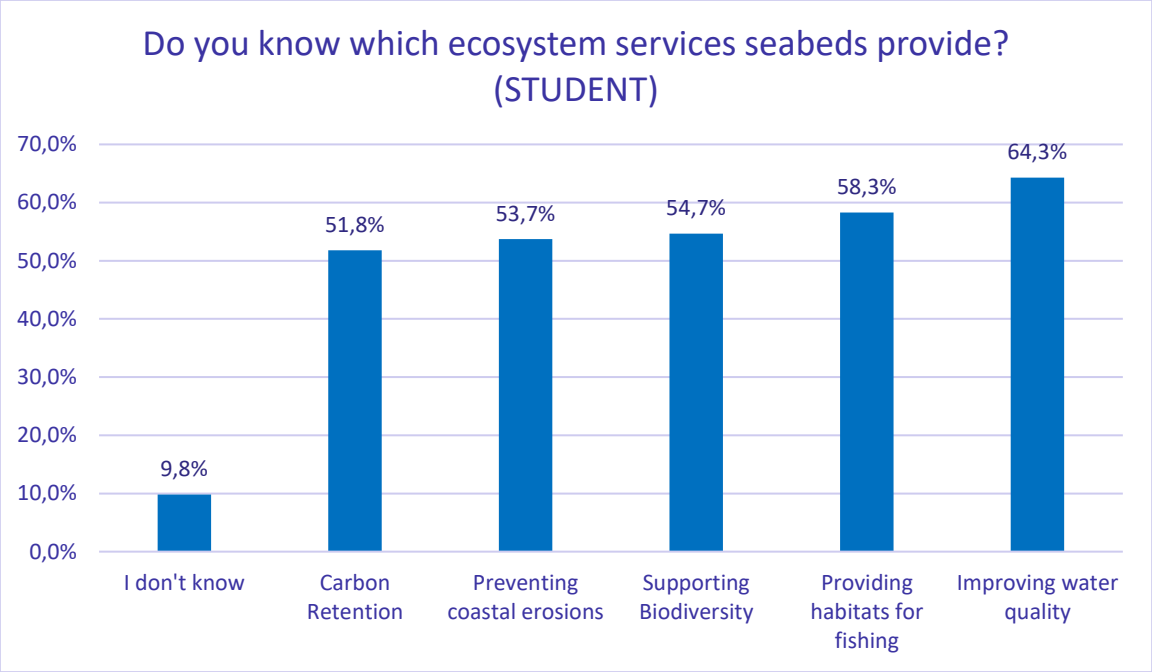


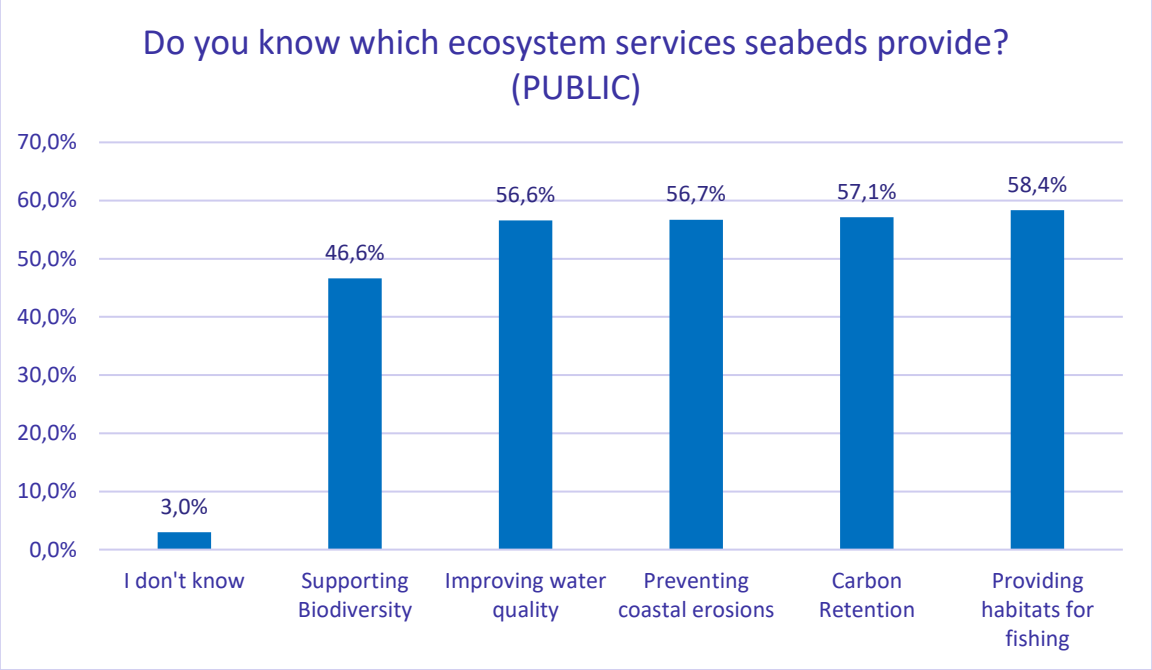

Do you know which ecosystem services seabeds provide?
(ENVİRONMENTAL ENGINEERS)
90,0%
80,0%
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
10,3%
48,3%
51,7%
62,1%
75,9%
82,8%
I don't know
Providing habitats for fishing
Preventing coastal erosions
Improving water quality
Carbon Retention
Supporting Biodiversity

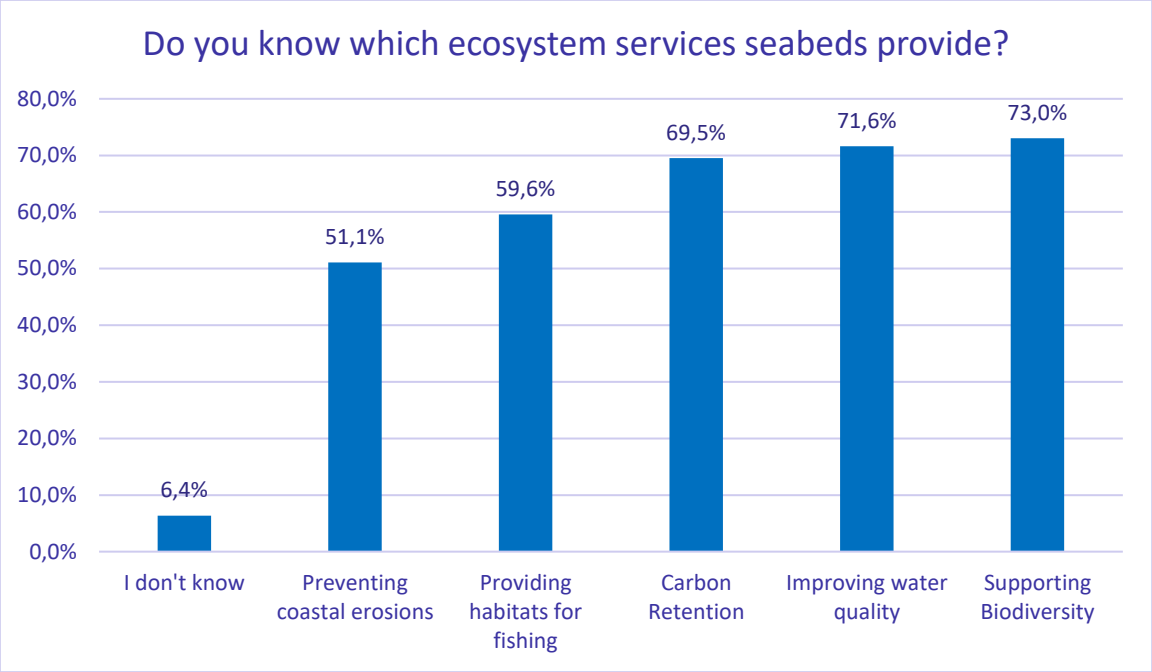

Do you know which ecosystem services seabeds provide?
(FISHERMAN/FISHERMAN COOPERATIVE MEMBERS)
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
1,7%
25,4%
50,8%
52,5%
57,6%
66,1%
I don't know
Carbon Retention
Providing habitats for fishing
Supporting Biodiversity
Improving water quality
Preventing coastal erosions


Do you know which ecosystem services seabeds provide?
(GOVERNMENTAL INSTUTION EMPLOYEES)
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
10,4%
46,9%
47,9%
47,9%
62,5%
65,6%
I don't know
Preventing coastal erosions
Carbon Retention
Providing habitats for fishing
Improving water quality
Supporting Biodiversity

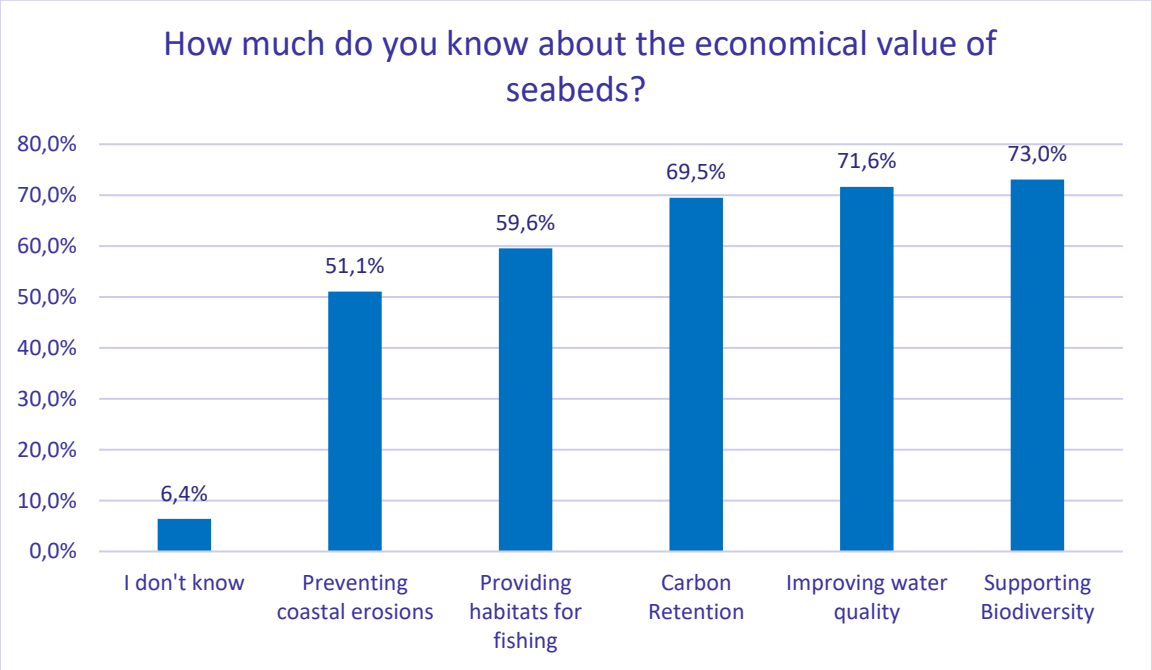

Do you know which ecosystem services seabeds provide?
(PRIVATE SECTOR(EIA EXPERT))
90,0%
80,0%
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
14,3%
71,4%
71,4%
85,7%
Providing habitats for fishing
Preventing coastal erosions
Supporting Biodiversity
Improving water quality


Do you know which ecosystem services seabeds provide? (STUDENT)
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
9,8%
51,8%
53,7%
54,7%
58,3%
64,3%
I don't know
Carbon Retention
Preventing coastal erosions
Supporting Biodiversity
Providing habitats for fishing
Improving water quality

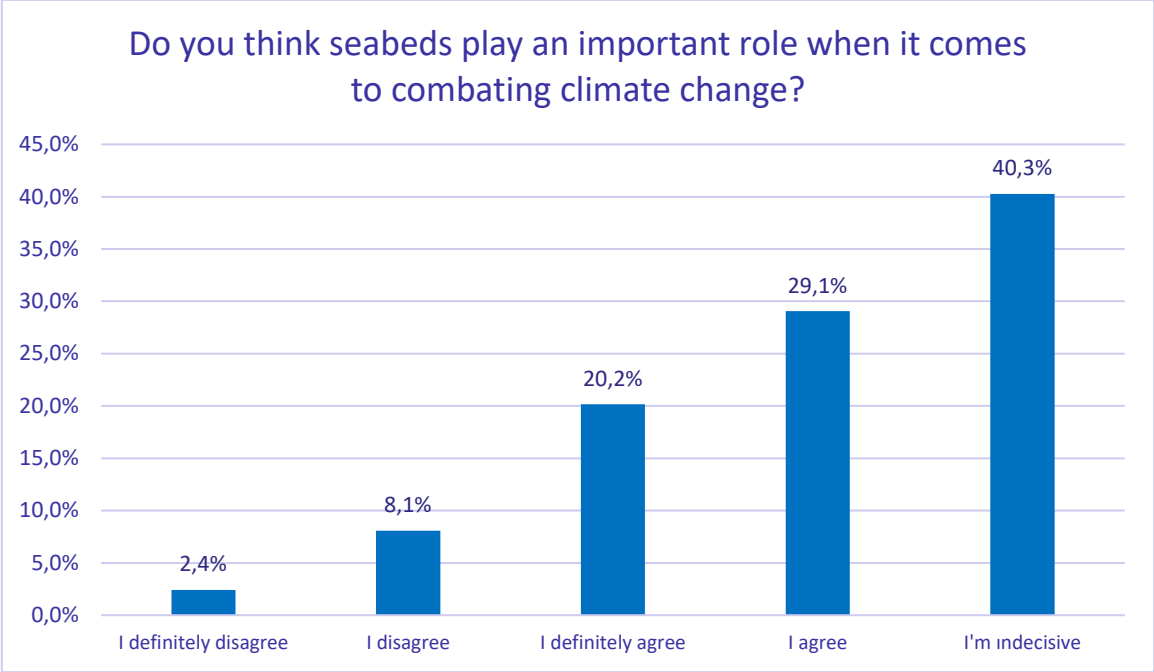

Do you know which ecosystem services seabeds provide? (PUBLIC)
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
3,0%
46,6%
56,6%
56,7%
57,1%
58,4%
I don't know
Supporting Biodiversity
Improving water quality
Preventing coastal erosions
Carbon Retention
Providing habitats for fishing



n=1572 The ecosystem service seabeds provide the most is supporting ''biodiversity'' (%73).



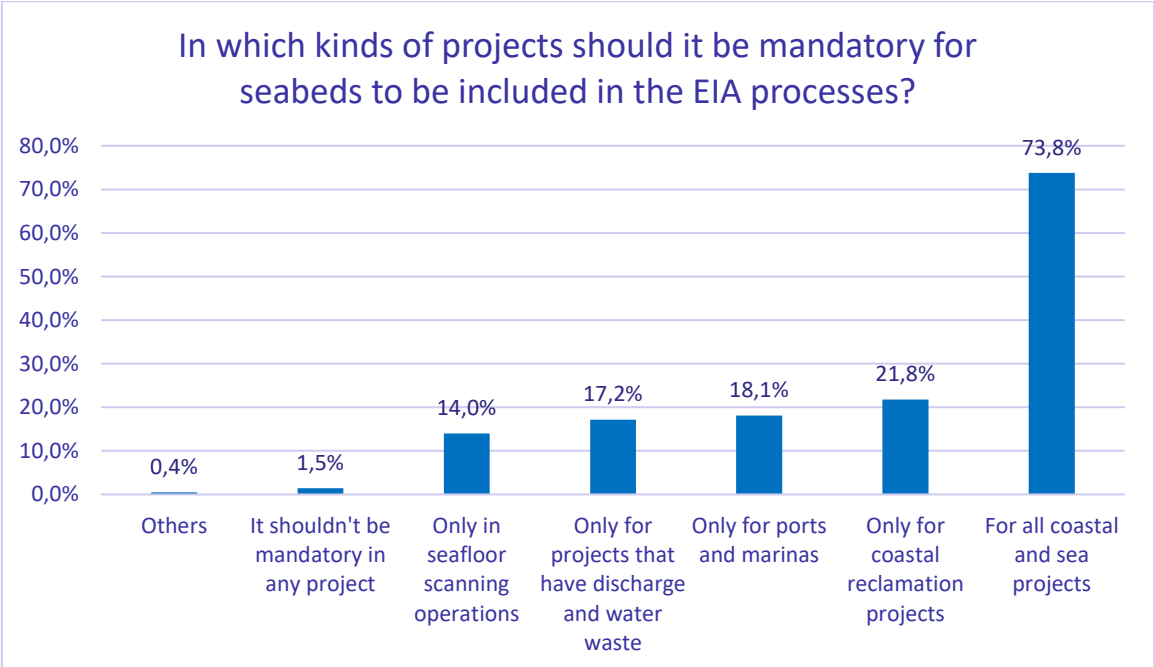
n=1572 The ecosystem service seabeds provide the most is supporting ''biodiversity'' (%73).



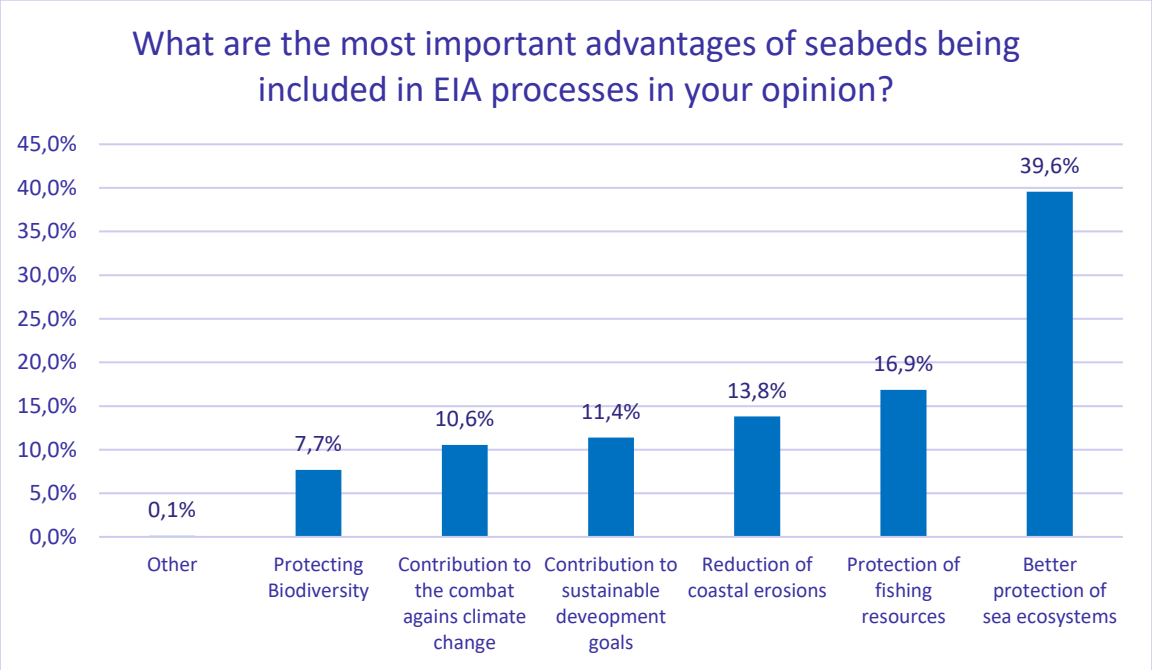
n=1572 Those who answered ''I'm indecisive'' regarding the effect of seabeds on climate change are (%40,3) the highest percentage.

T2B=49,2%
B2B=10,5%
Mean=2,10

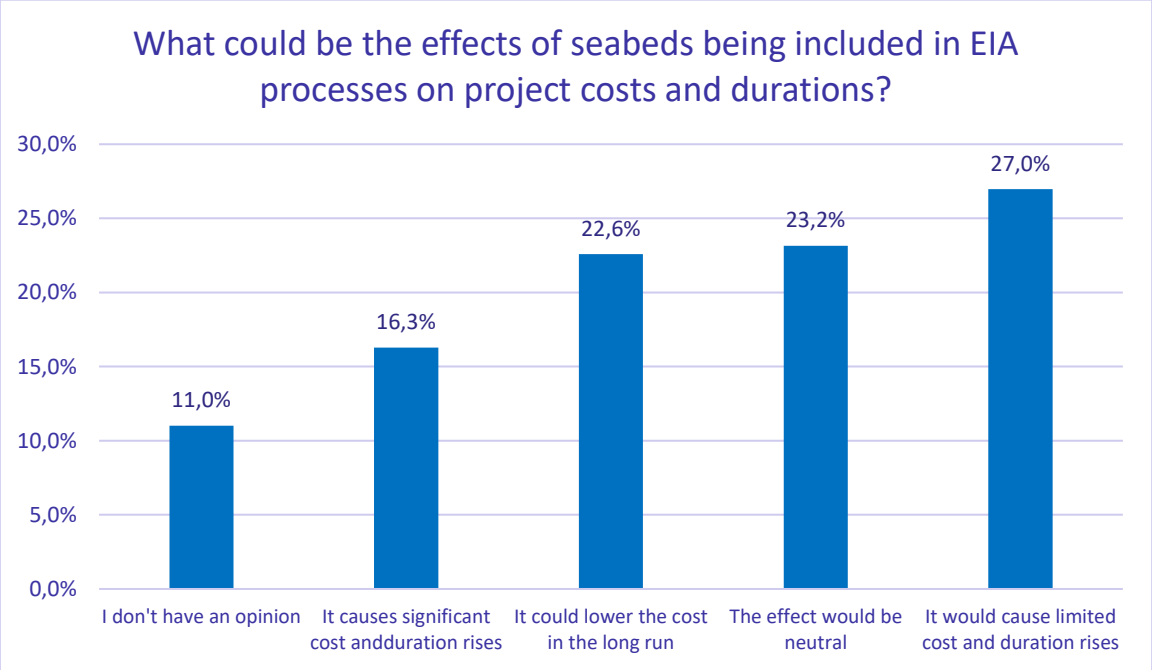
INTEREST AND AWARENESS RATES REGARDING SEABEDS



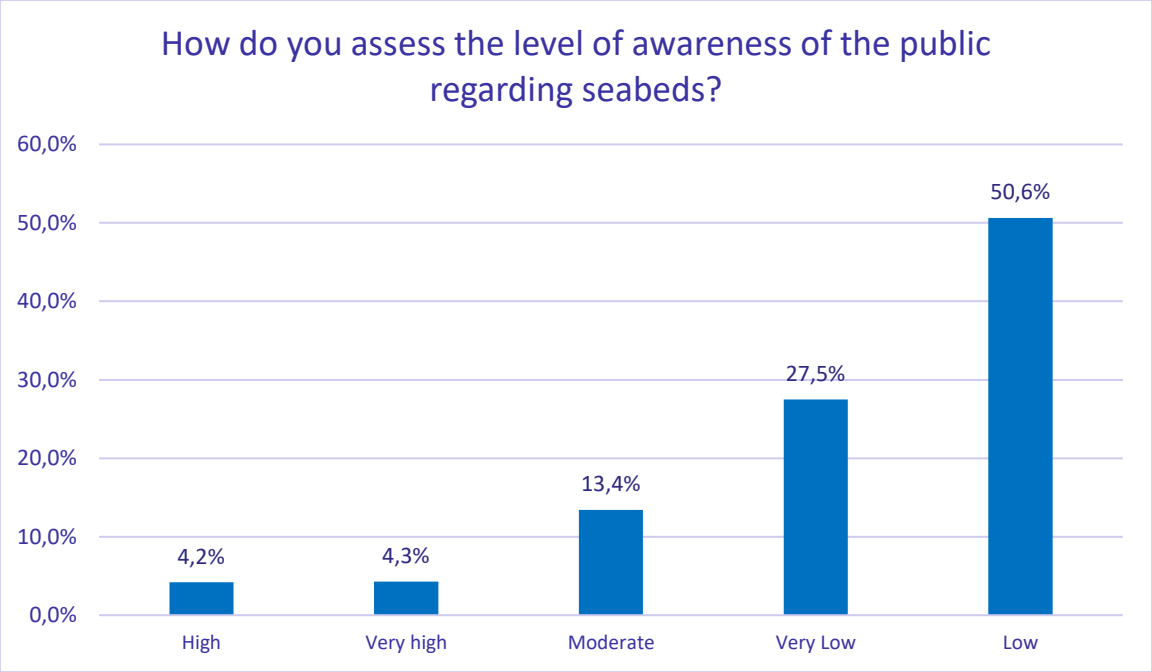
n=1572 It was stated that seabeds should be included in the EIA processes for ''all coastal and sea projects'' (%73,8).



n=1572 ''Better protection of sea ecosystemts'' is the most important advantage of seabeds being included in EIA processes.

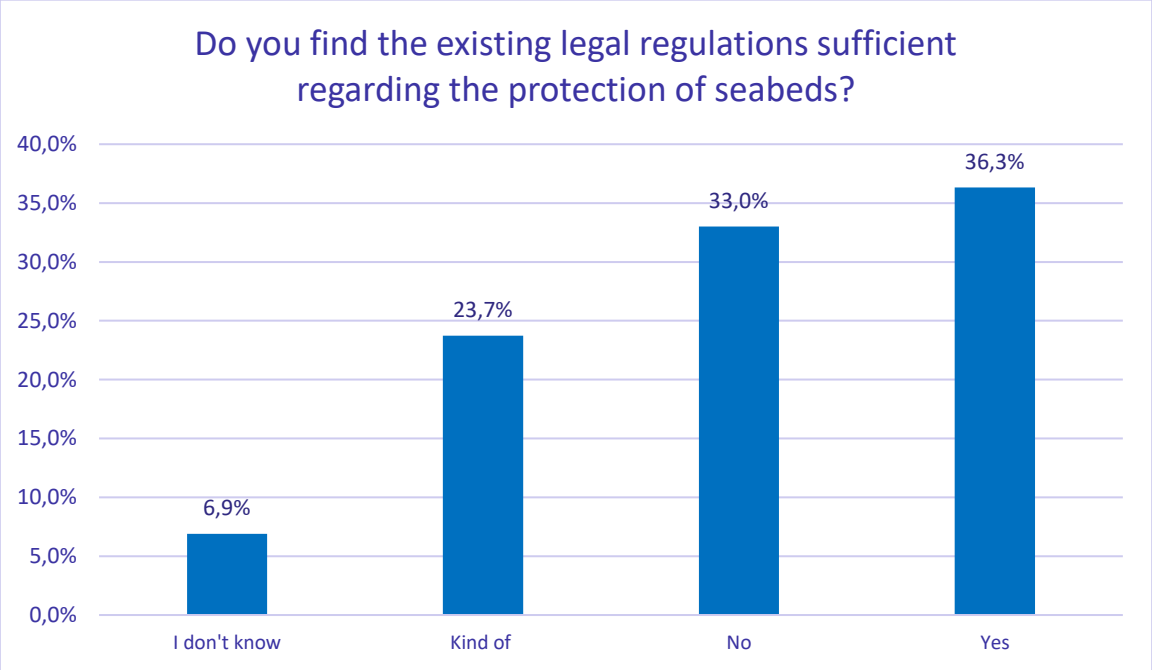


n=1572 The impact of including seabeds in the EIA processes on cost and duration is "It would cause limited cost and duration increase" (27%).

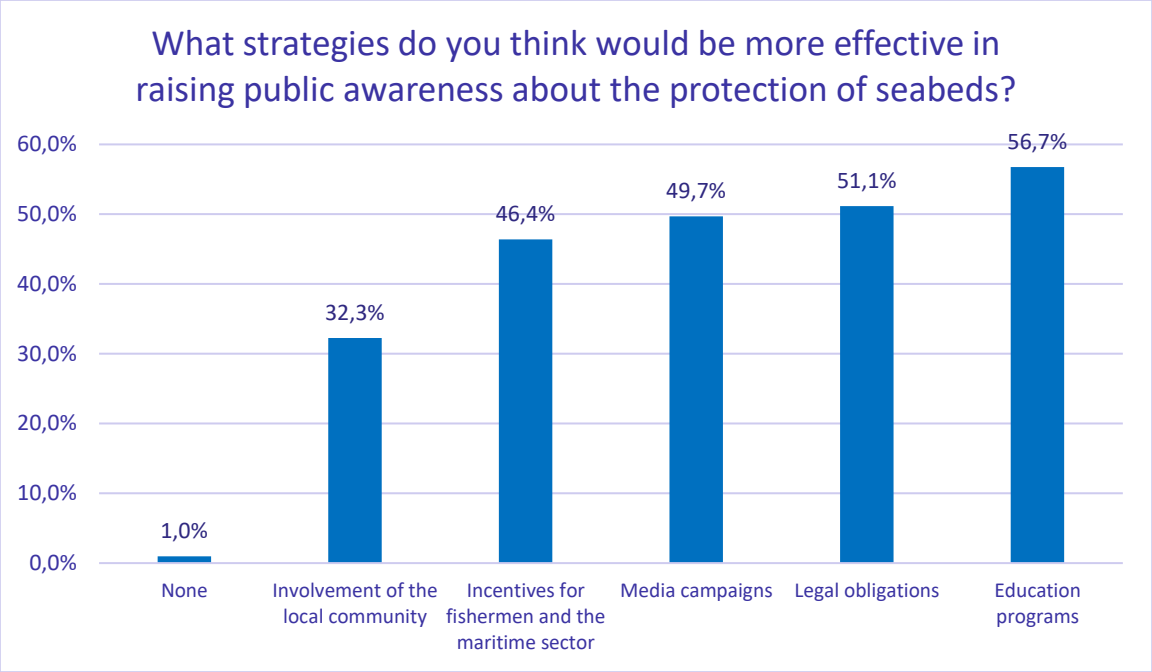


n=1572 The public's awareness of seabeds is 'Low' (51.1%).

T2B=8,5%
B2B=78,1%
Mean=2,02

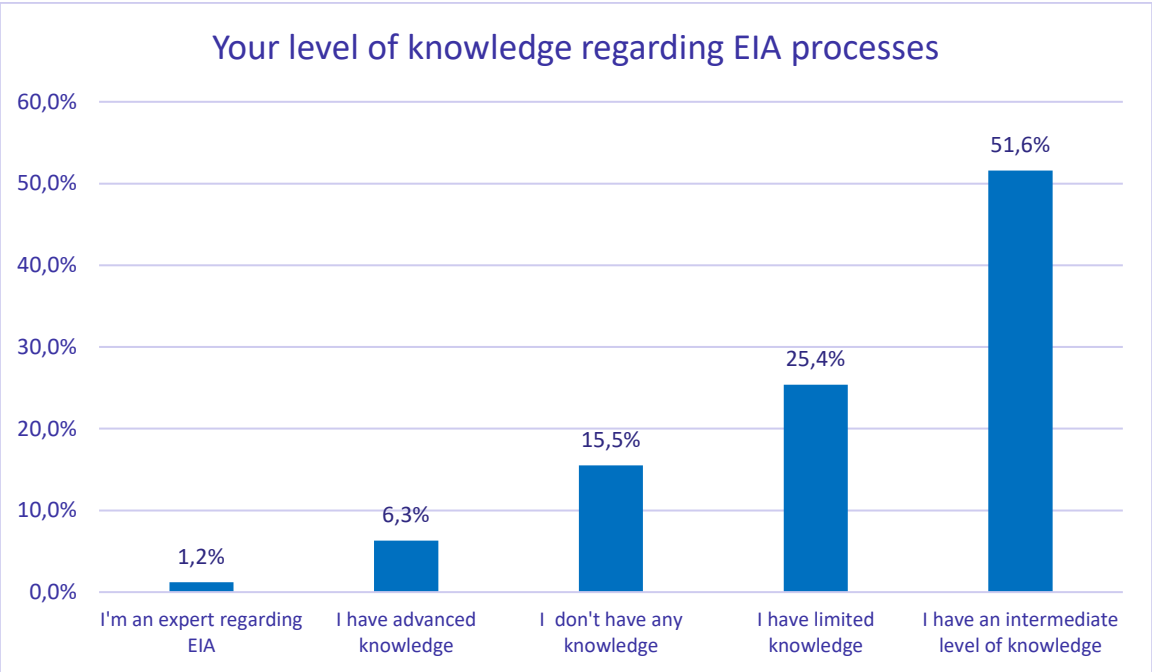


n=1572 There are those who find the existing legal regulations for the protection of seabeds 'Yes' (%36.3) sufficient.

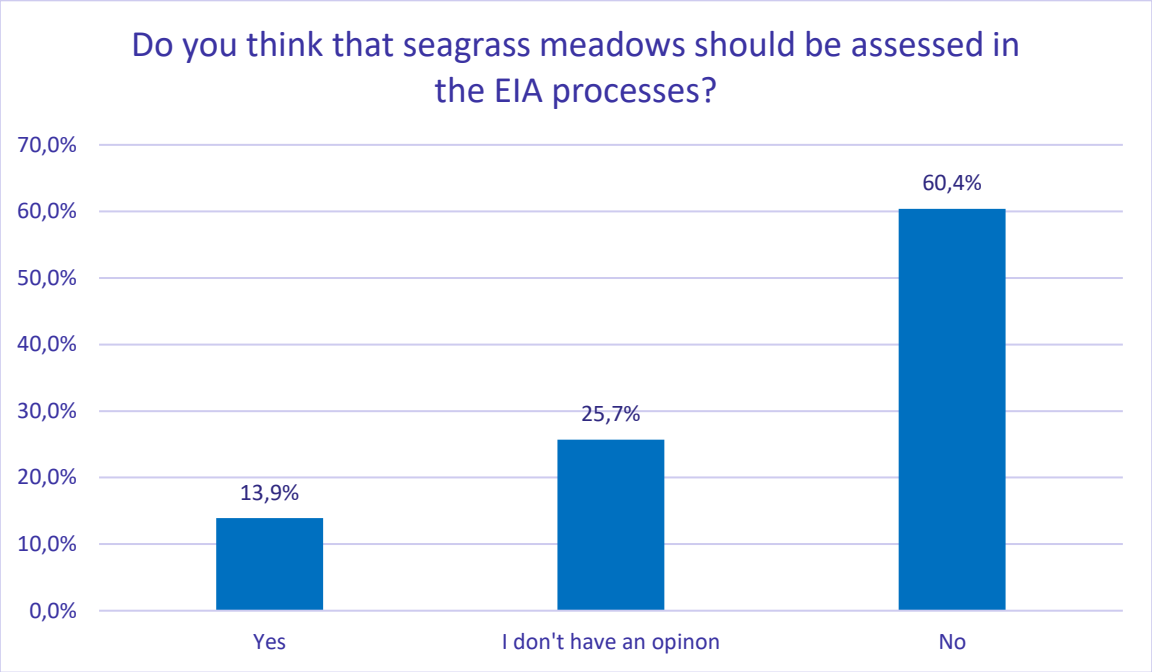


n=1572 Public awareness through 'Education programs' (56.7%) have been highlighted regarding the protection of seabeds.

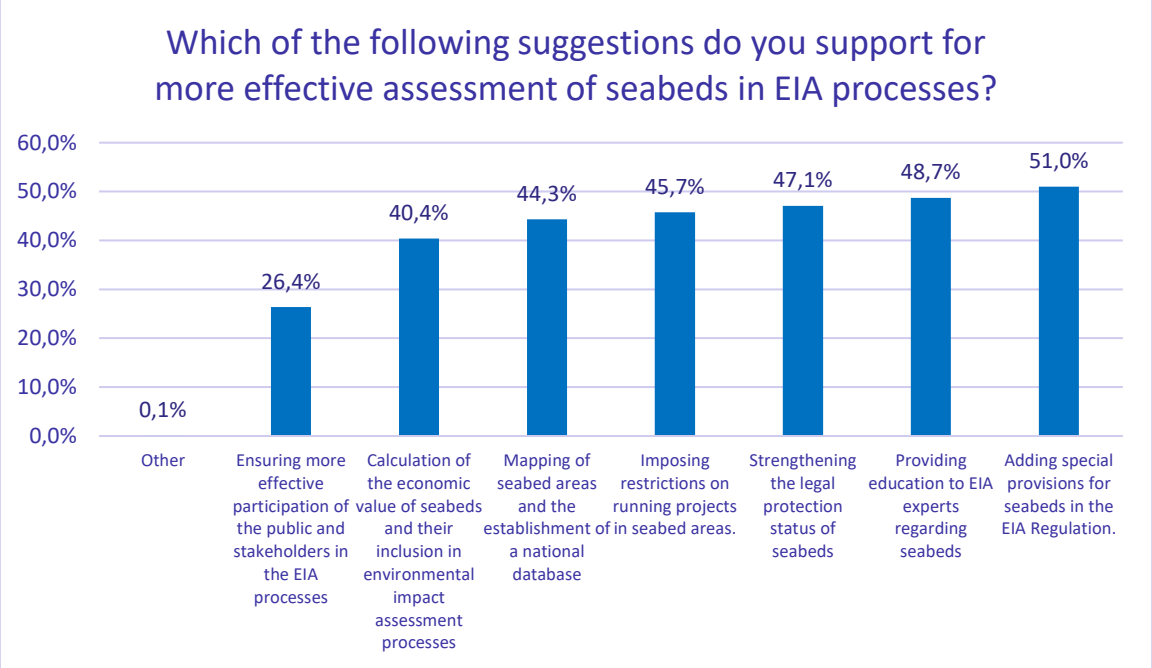
SEABEDS EIA AND LEGISLATION KNOWLEDGE LEVEL



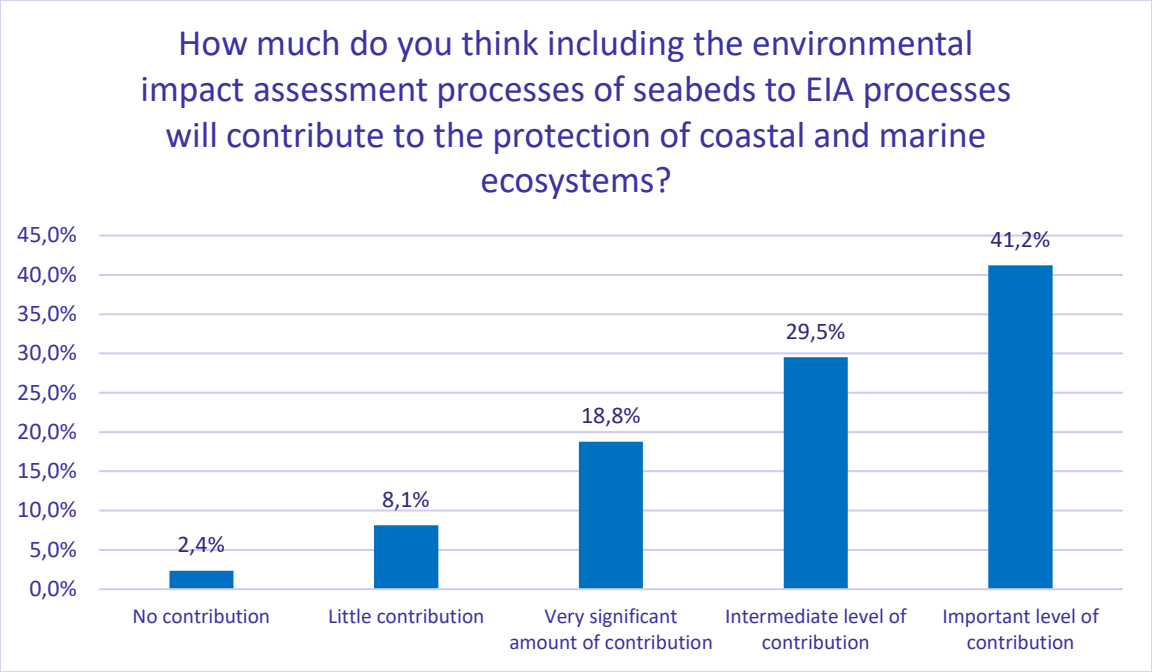
n=1572 “I have an intermediate level of knowledge” (%51,6) regarding EIA processes.



n=1572 60.4% of respondents said No to the evaluation of seabeds in EIA processes.

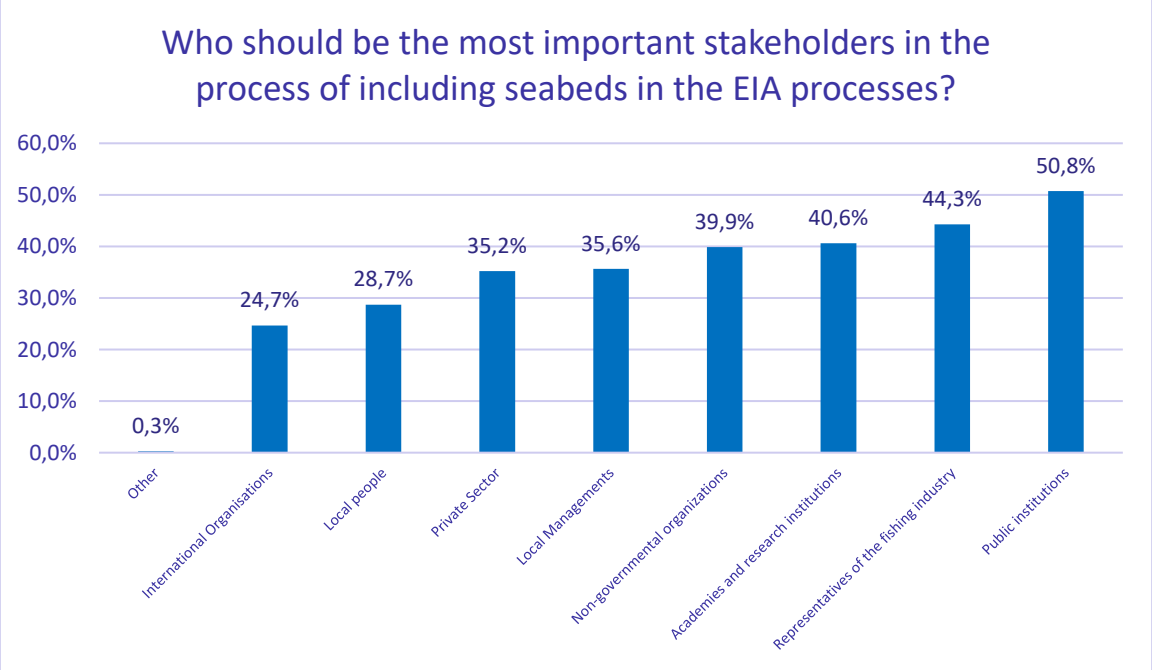


n=1572 "Addition special provisions for seabeds" (51%) has been highlighted regarding seabeds being assessed more effectively in EIA processes.

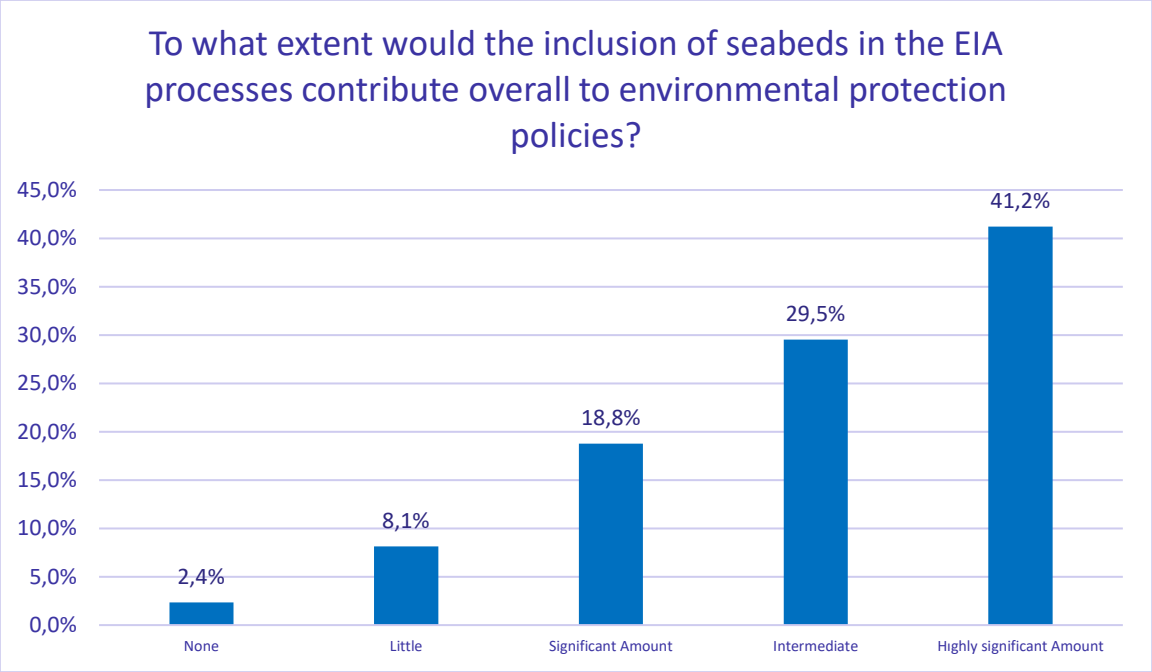


n=1572 The inclusion of seabeds in the EIA processes makes an ''important level of contribution'' (%41,2) to the protection of coastal and marine ecosystems.

T2B=60% B2B=10,5% Mean=3,66

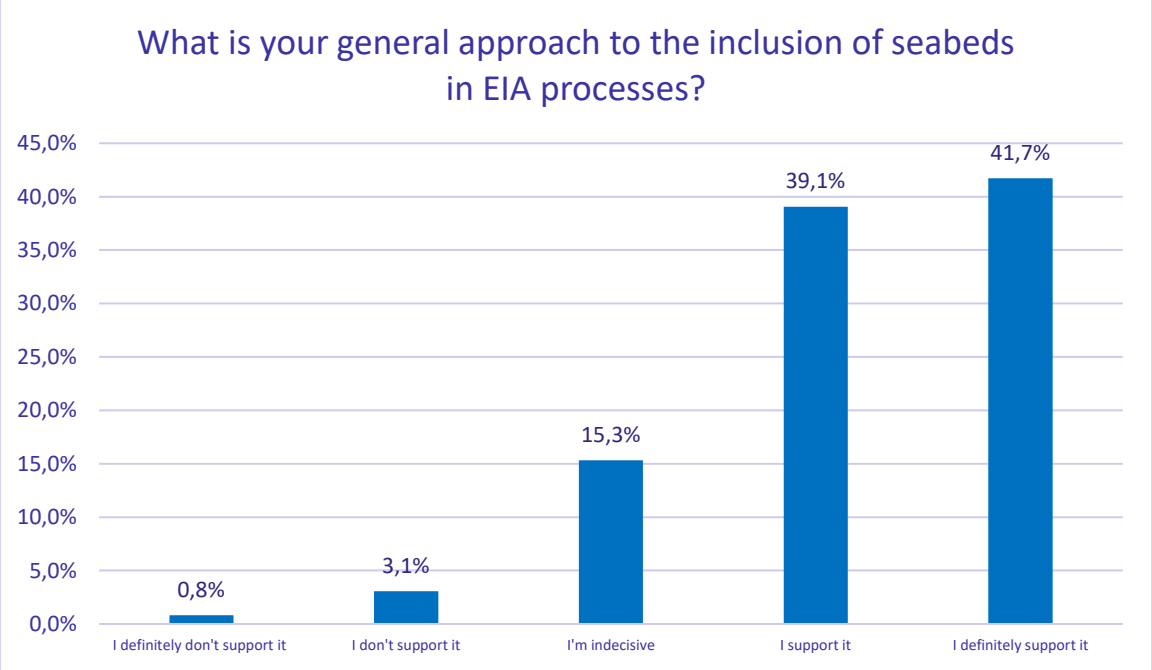


n=1572 In including seabeds in EIA processes, ''Public institutions'' should constitute 50.8%.



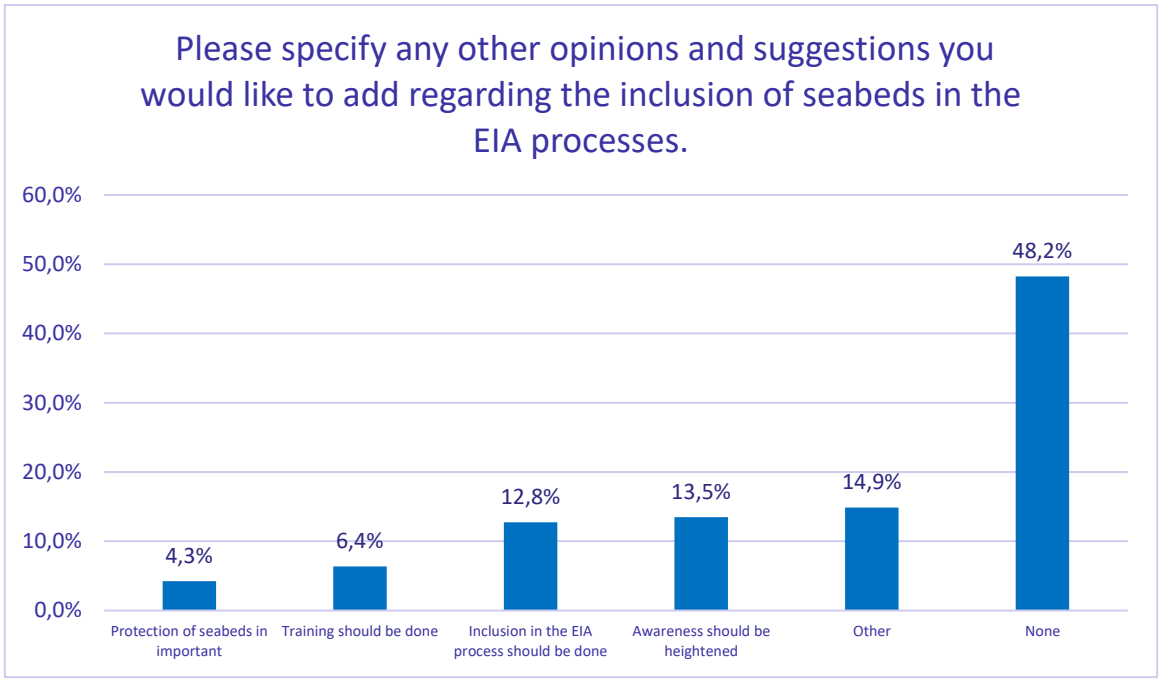
n=1572 The inclusion of seabeds in the EIA processes would have a "Highly significant amount''(41.2%) of contribution to environmental protection policies.

T2B=60% B2B=10,5% Mean=3,68

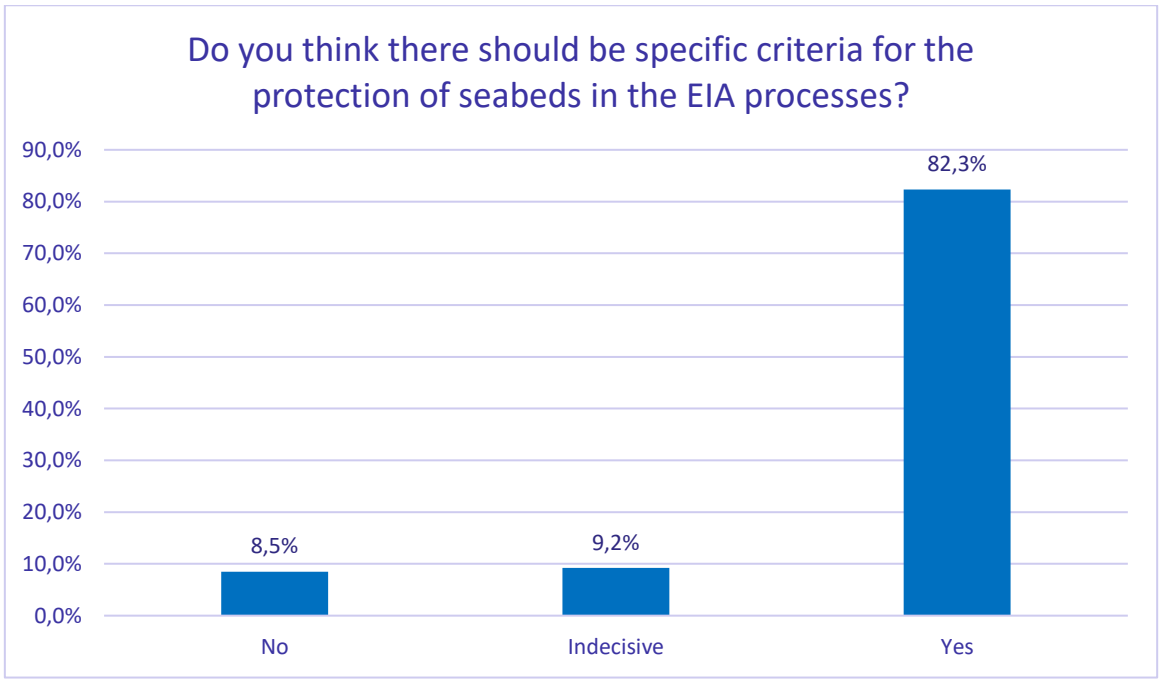


n=1572 ''I definitely support'' (%41.7) the inclusion of seabeds in the EIA processes.

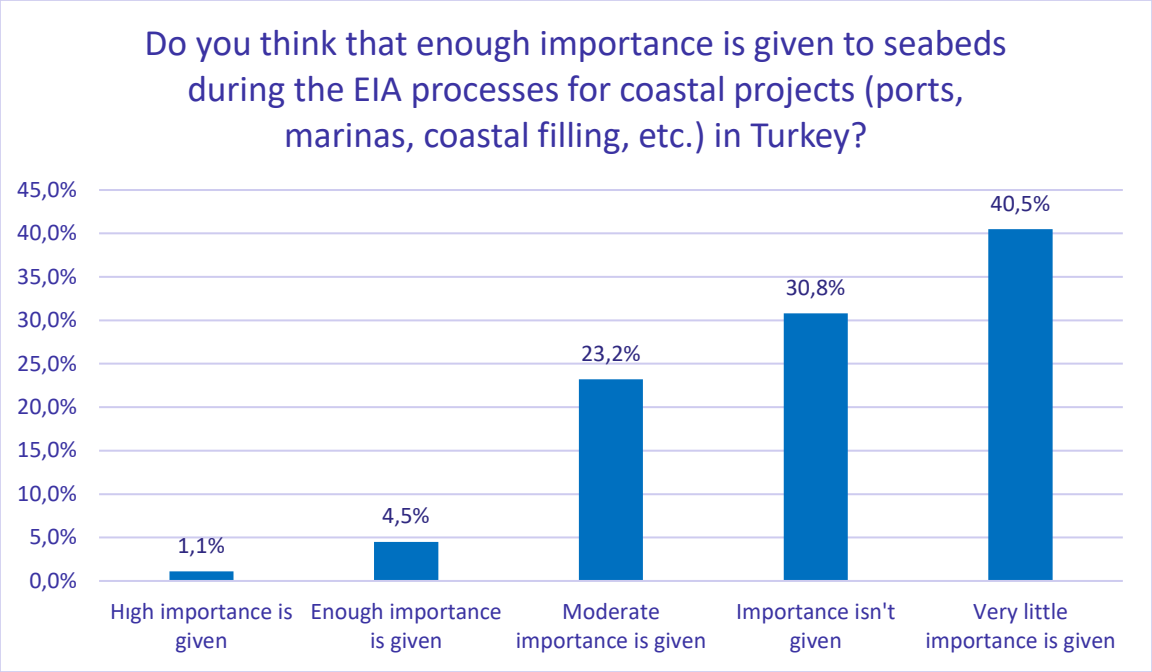
T2B=80,8% B2B=3,9% Mean=3,85



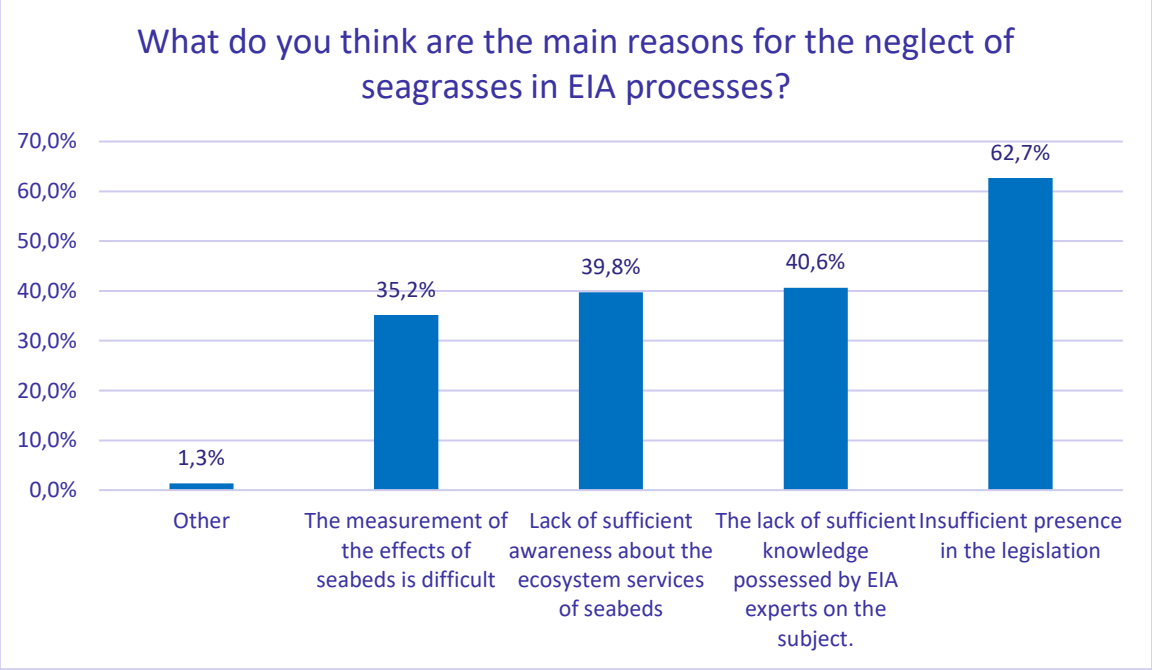
n=1572 The invlusion of seabeds in the EIA process would ‘’Heighten the awareness’’ (%13,5).



n=1572 Those who wish for the existence of specific criteria for the protection of seabeds in EIA processes constitute 82.3%.



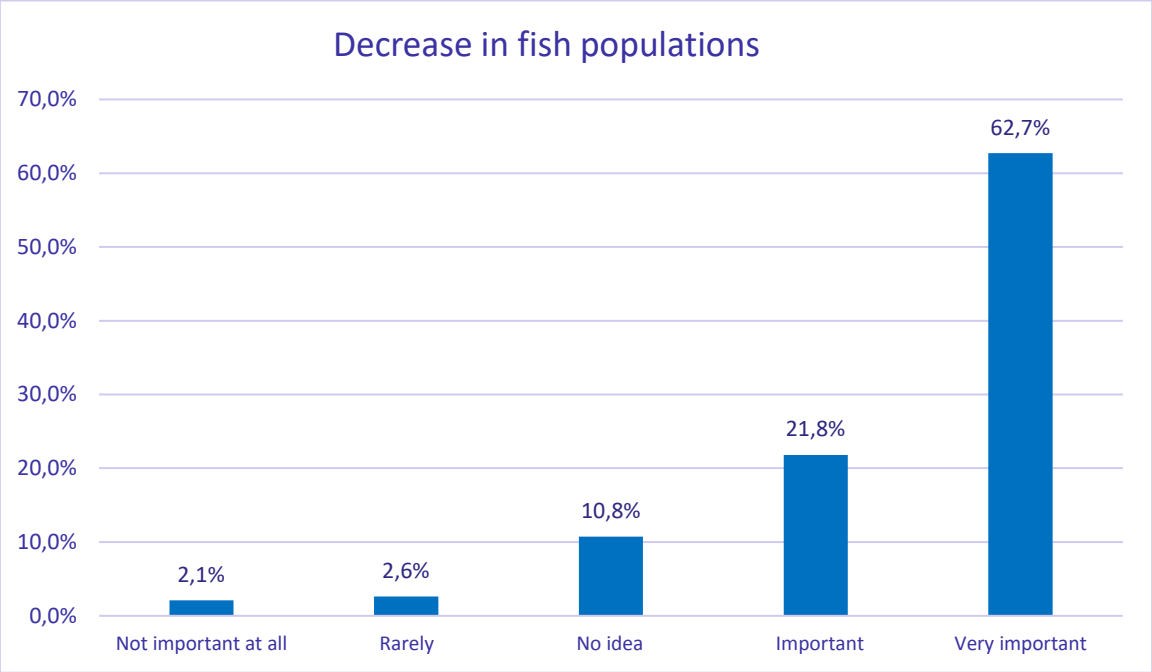
n=1572 In the coastal projects in Turkey, it has been observed that seabeds were regarded with very little importance at a rate of 40.5% in the EIA processes.



n=1572 The main reason for the lack of consideration of seabeds in the EIA processes is their ''insufficient presence in the legislation'' (62.7%).

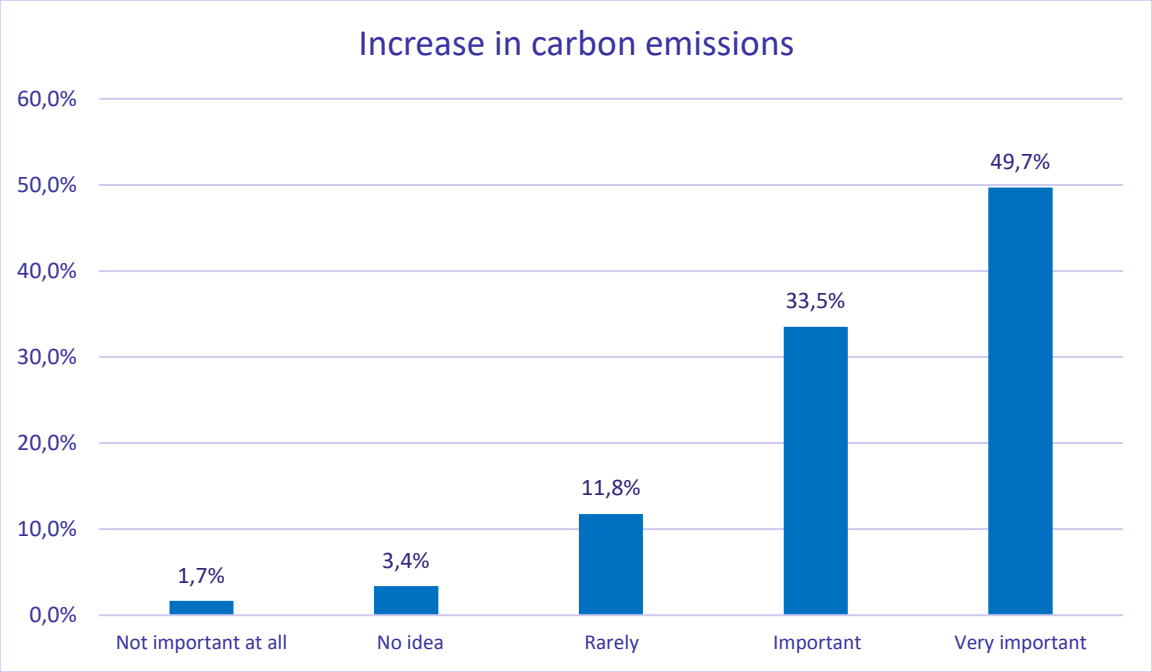
PRIORITY LEVEL REGARDING THE PROTECTION OF SEABEDS

How important do you find the following consequences of the disappearance of seagrass



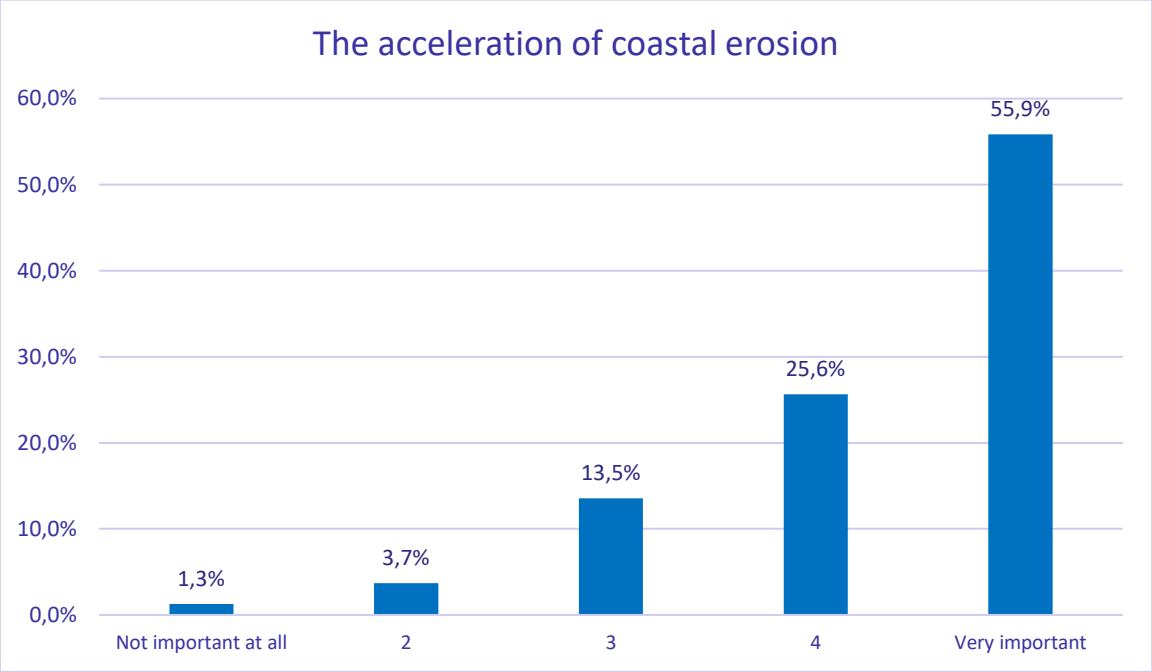
n=1572 The disappearance of seabeds is 'Very important'(%62,7) in regards to 'Decrease in fish populations'.

T2B=84,5% B2B=4,7% Mean=4,40



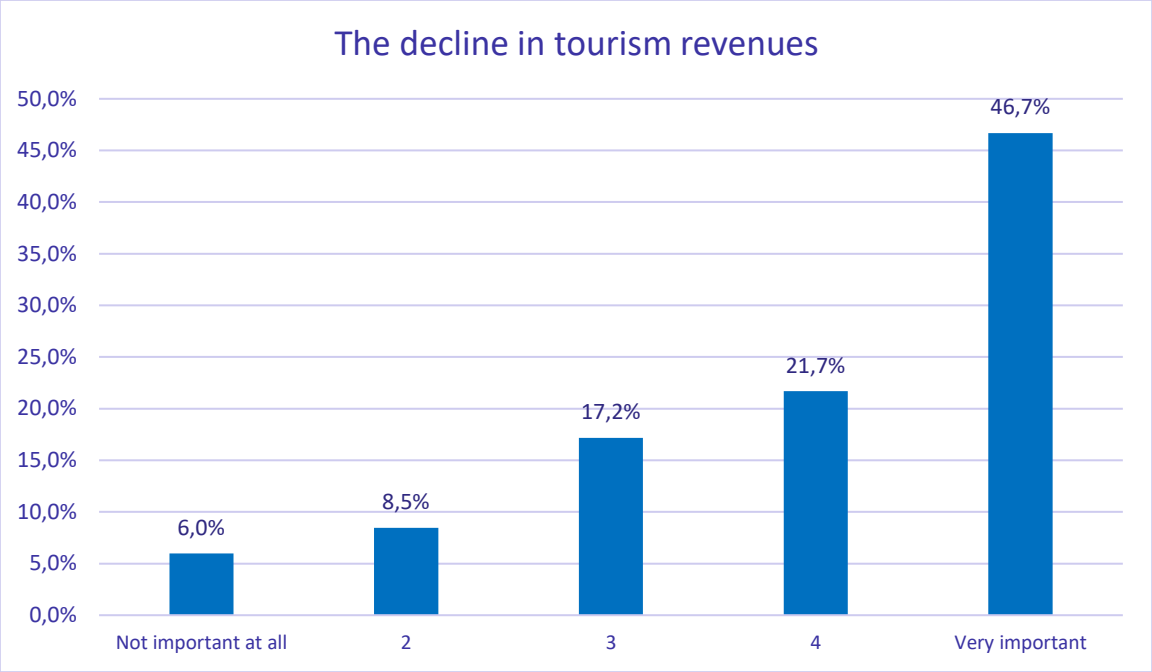
n=1572 The disappearance of sea grasses is 'Very important'(49.7%). in terms of the 'Increase in carbon emissions'.

T2B=83,2% B2B=5% Mean=4,26



n=1572 The disappearance of seabeds is "very important"(%55.9) in the "acceleration of coastal erosion".

T2B=81,5% B2B=5% Mean=4,31

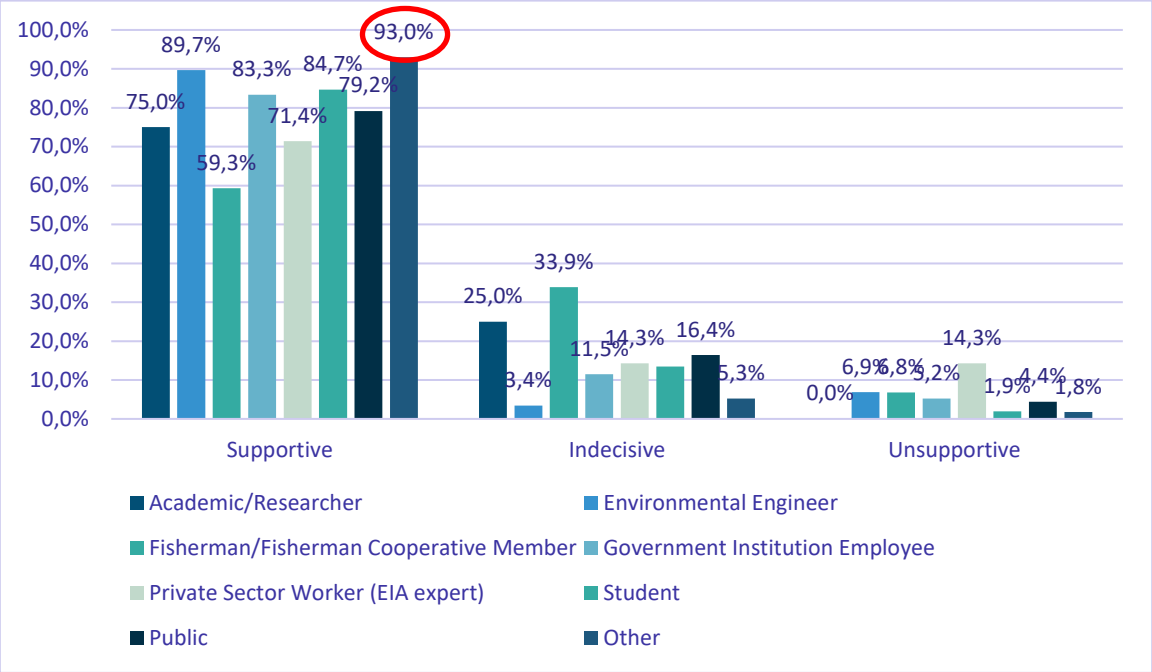


n=1572 The decrease in tourism revenues is "very important" (%46.7) in the disappearance of seabeds.

T2B=68,4% B2B=14,4% Mean=3,95

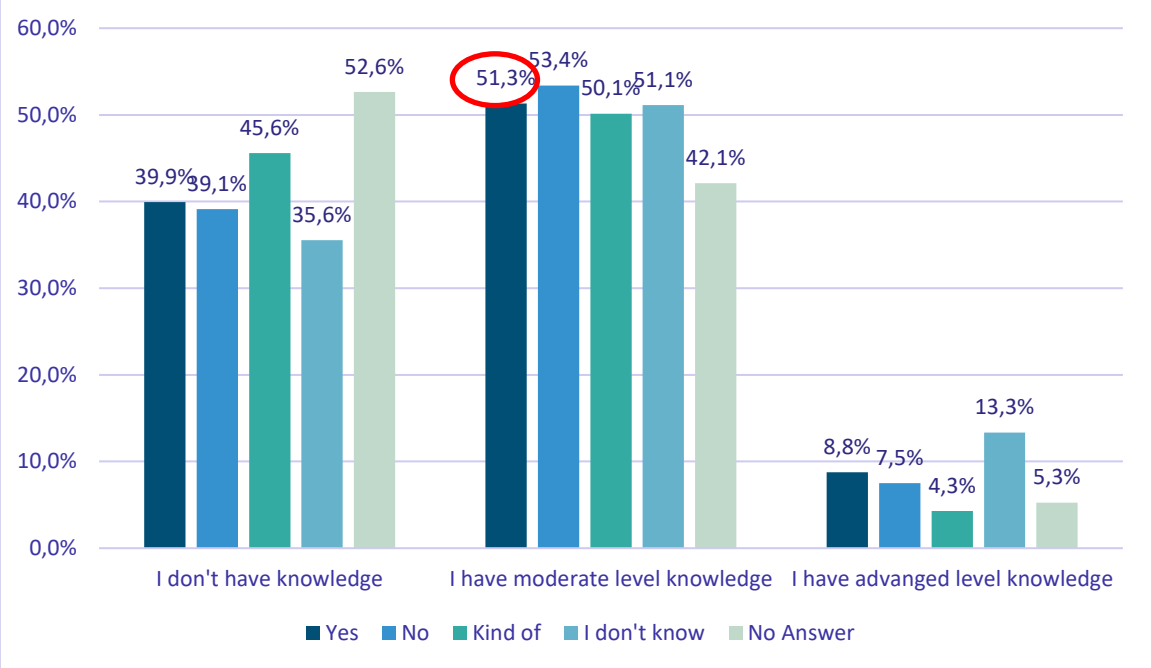
4. Further Analysis :

The relation between Occupation and the inclusion of seabeds in EIA processes



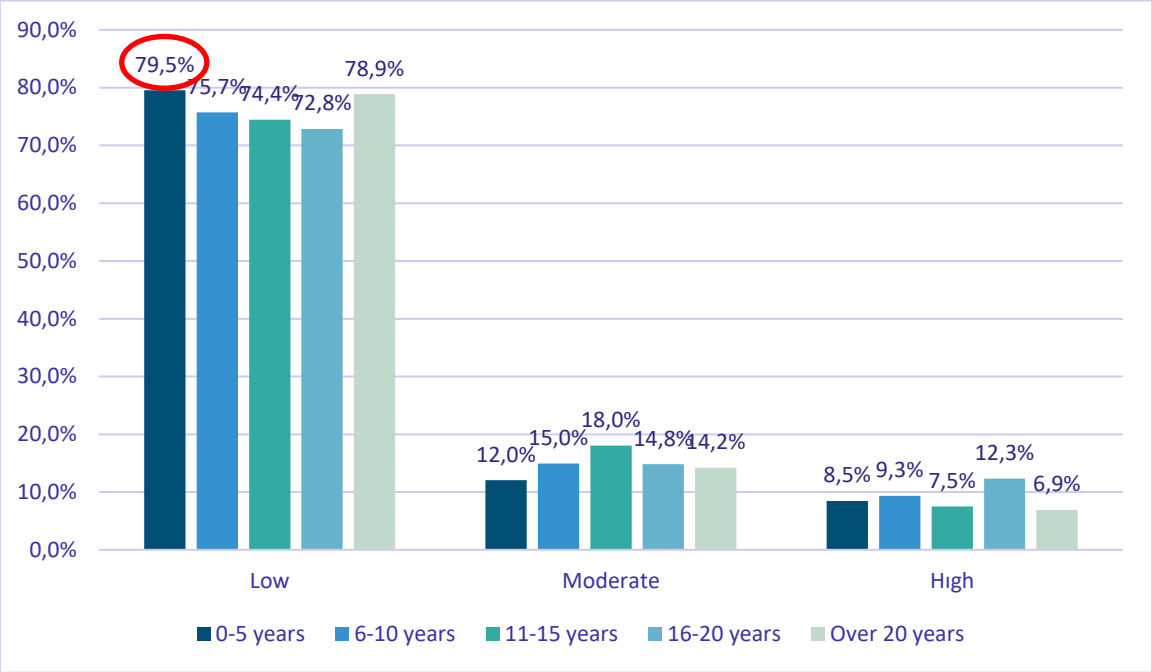
n =1572 The group that supports the inclusion of seabeds in the EIA processes the most is the 'Environmental Engineers' (93%).

The relationship between the level of information regarding the EIA processes and those who find the legal regulations sufficient for the protection of seabeds.



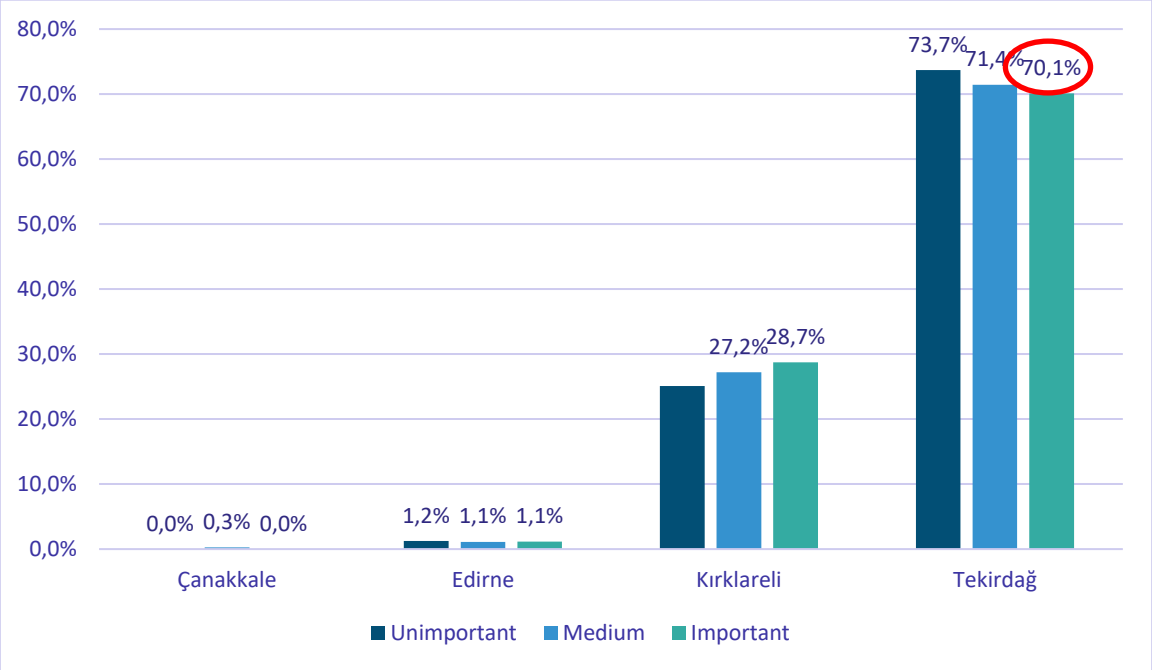
n =1572 Among those who stated "I don't have knowledge" regarding the EIA processes, 51.3% found the legal regulations concerning seabeds to be sufficient by answering "Yes."

The relationship between the level of experience and awareness



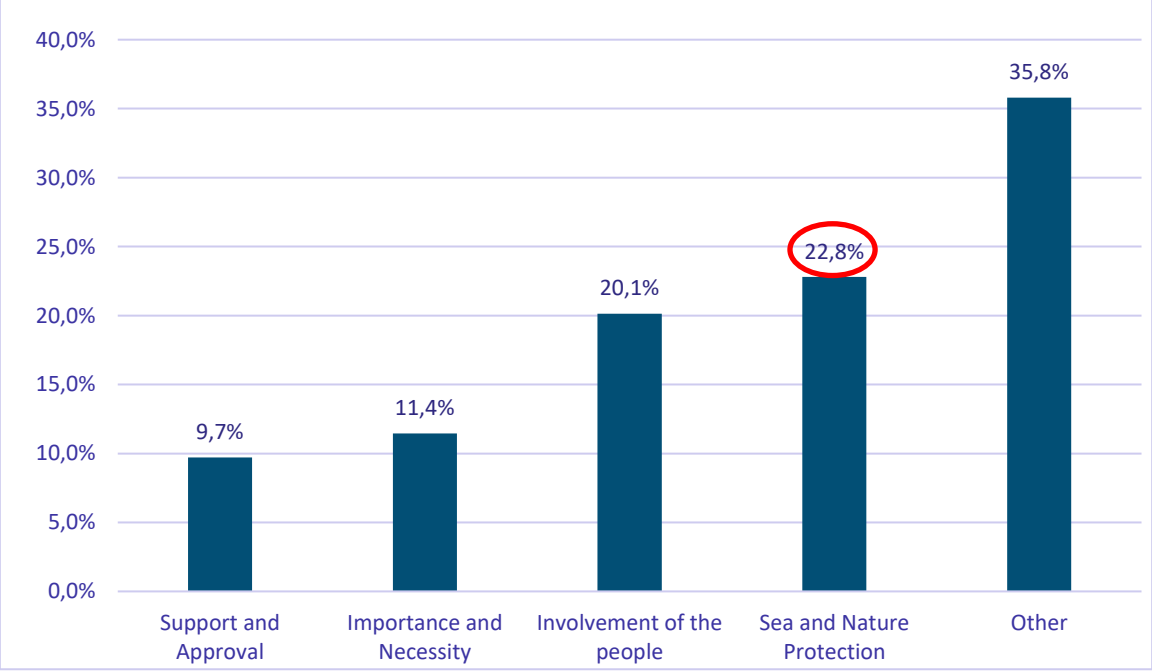
n =1572 Those with '0-5 years' of experience have a clear level of awareness at a rate of 79.5%.

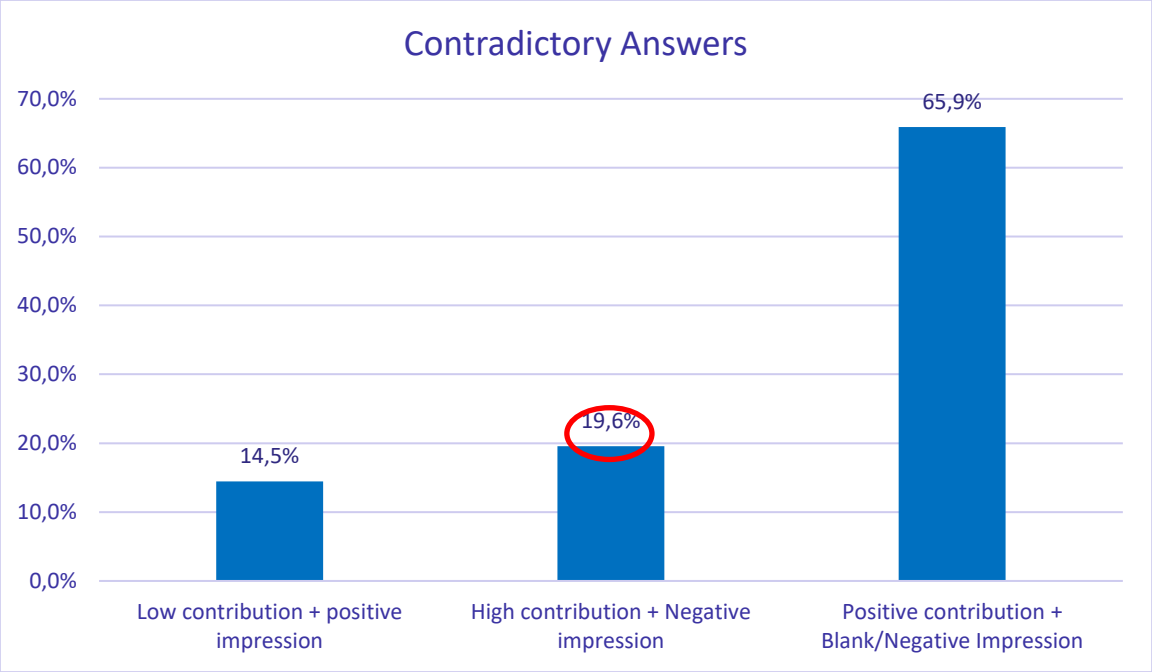
Region and the importance given to seabeds



n =1572 The importance given to seagrass in the region of 'Tekirdağ' stands out with a rate of 70.1%.

Distribution Percentage of Supportive Answers




Contradictory Answers
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
14,5%
19,6%
65,9%
Low contribution + positive impression
High contribution + Negative impression
Positive contribution + Blank/Negative Impression

4. DISCUSSION

The study revealed that although awareness regarding seabeds is low, there is a strong desire for conservation. This suggests that the lack of knowledge can be addressed through awareness campaigns and education. Additionally, the uncertainty in legislation leads to serious information and policy gaps in practice.

The biological monitoring criteria within the EIA process should be revised to include seabeds.

There is a decline in experience and awareness, as well as a lack of concern. Measures should be taken regarding this.

Solutions should be produced to improve the quality of water.

5. RESULTS AND RECOMMENDATIONS

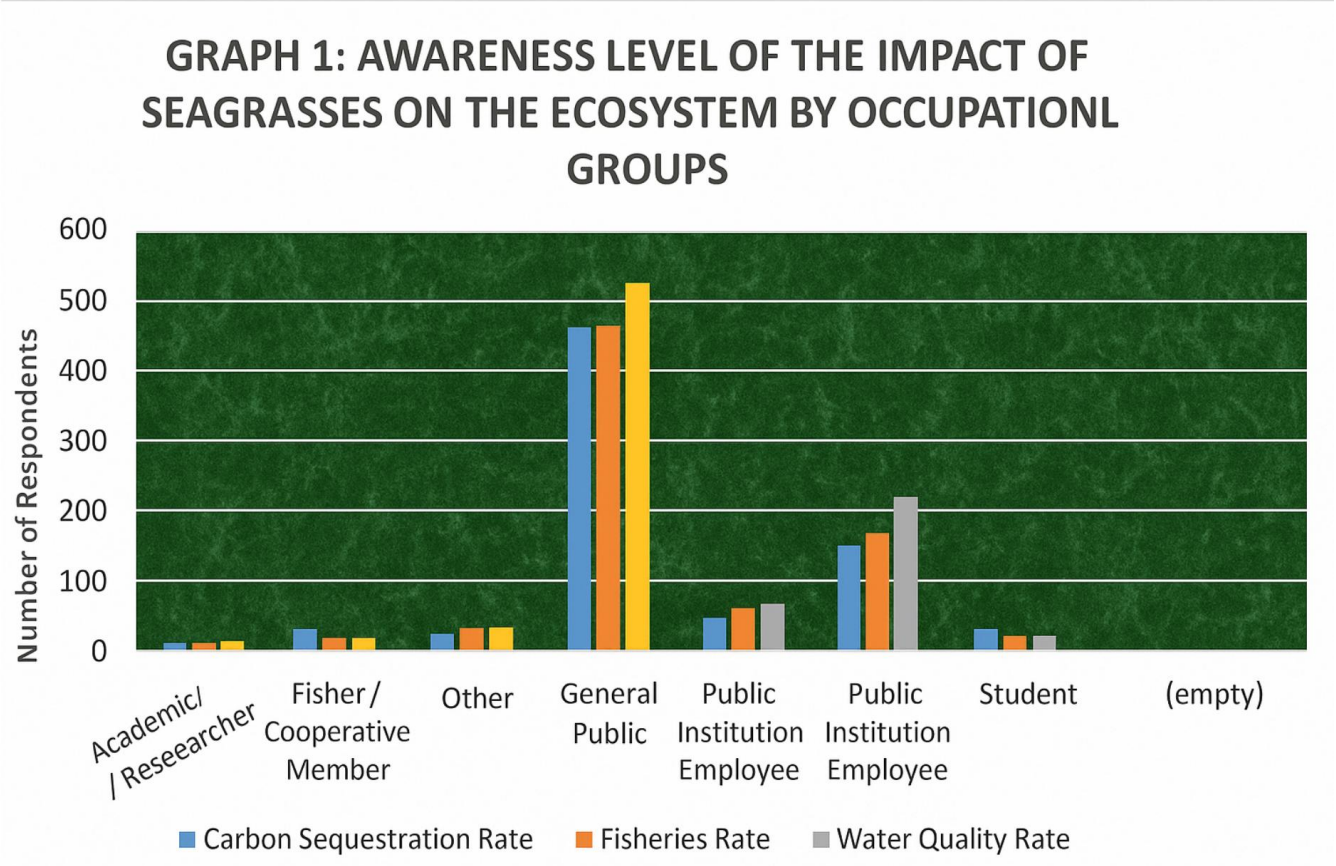
Seabeds should be explicitely defined in the EIA Regulation and evaluation criteria should be established.

Educational and informational campaigns should be conducted at local and national levels.

The current state of seabeds should be mapped and included in the conservation areas.

Final Analysis

GRAPH 1: Awareness Level of the Impact of Seagrasses on the Ecosystem by Occupational Groups



Analysis and Interpretive Summary of Stakeholder Awareness

The analysis of the survey results reveals a clear hierarchy in environmental awareness and participation among the stakeholder groups, with the **Public** and **Students** forming the core of the sample's engagement.

1. Dominance of the Public Segment

The **Public** segment exhibits the highest rates across all indicators by a significant margin. This suggests a **high level of environmental awareness** and active participation within the general population sampled.

- **Carbon Sequestration:** 60% of participants prioritize this issue.
- **Fisheries:** 58% express concern for fisheries.
- **Water Quality:** 54% prioritize water quality.
- **Erosion:** 58% consider erosion important.
- **Biodiversity:** 52% emphasize biological diversity.

These figures indicate that environmental awareness is strongly represented by high participation rates at the general public level.

2. High Engagement from Students

Students constitute the second most active group after the Public. This demographic shows a high degree of concern for environmental issues:

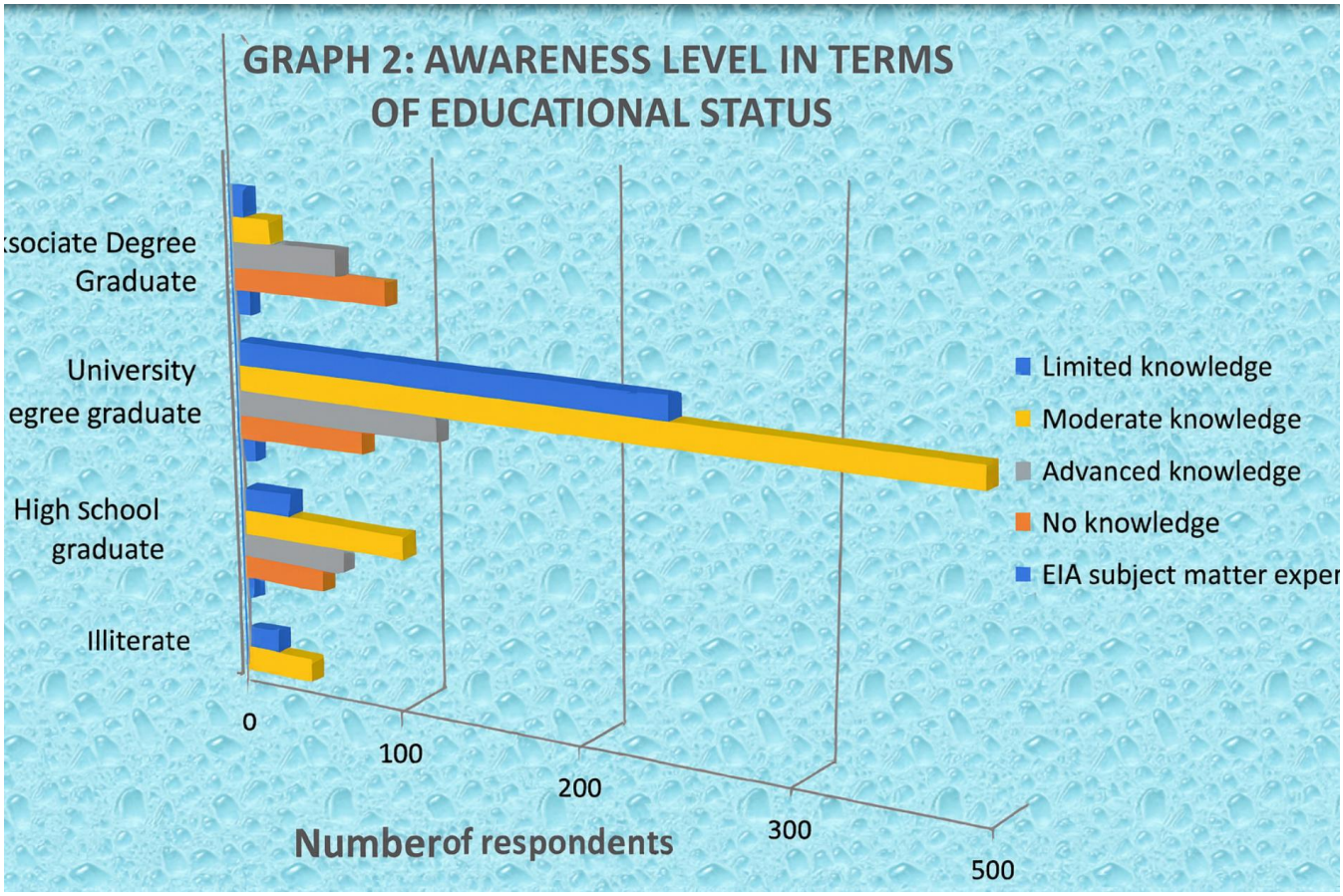
- **Water Quality and Biodiversity:** Represented at approximately **28%** in both areas.
- **Carbon Sequestration:** Represented at **25%**.

This demonstrates the **sensitivity and engagement of the young population** regarding critical environmental topics.

3. Institutional and Sectoral Awareness

- **Public Institution Employees:** Participation rates generally fall in the **5%–8%** range. They show a relatively higher interest, particularly in **Biodiversity (7.76%)**.
- **Fishermen/Fisheries Sector:** This group shows low overall participation in general environmental issues. However, they are comparatively more sensitive in areas directly related to their livelihood and operational environment, such as **Fisheries (3.33%)** and **Erosion (4.45%)**.
- **Academics and Private Sector (EIA Specialists):** The participation rates for **Academics** and the **Private Sector** are very low. This confirms that the bulk of the survey participation and thus the represented awareness levels are heavily skewed towards the **Public and Student groups**, limiting the extent to which institutional or expert perspectives were captured.

GRAPH 2: Overall Awareness Level of Seagrasses by Educational Attainment



Analysis and Interpretation

Overview of Awareness by Education Level

Due to the majority of the participants being middle school graduates (approximately 53.8%), this group naturally possesses the highest overall representation in the awareness indicators.

- **29%** of this group reported having **"intermediate knowledge"**
- **12.9%** reported having **"limited knowledge"**
- **8.9%** reported having **"no knowledge at all"**

This suggests that middle school graduates possess **partial awareness** regarding EIA (Environmental Impact Assessment – *ÇED*), but lack in-depth understanding.

Secondary and Higher Education Levels

High school graduates rank second:

- **11.6%** reported having **intermediate knowledge**.
- **5.5%** reported having **limited knowledge**.

This group holds basic environmental knowledge but is far from an expert level of understanding.

Primary school and uneducated participants have low overall rates. However, the proportion of those with **"no knowledge at all"** (1%–1.5%) within these specific groups is notable.

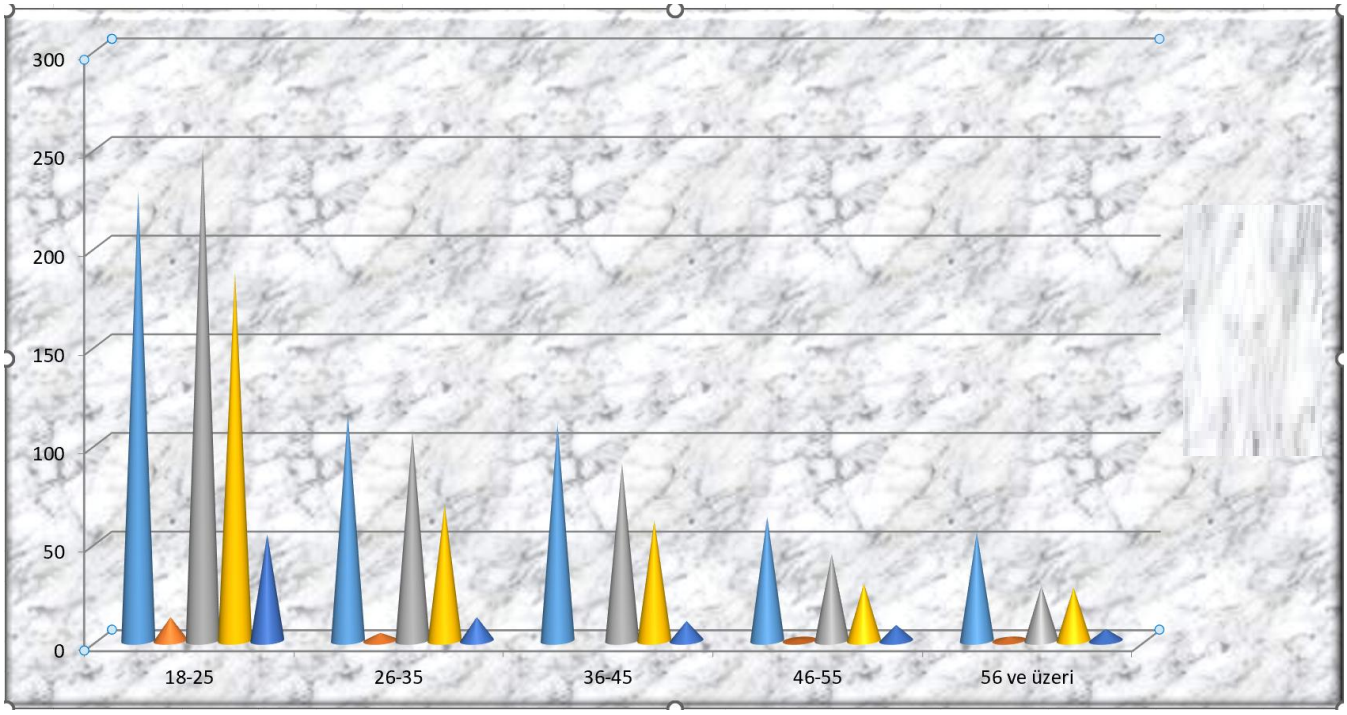
University graduates (undergraduate and associate degree) appear to have very low overall rates because they constitute a very small portion of the total participant pool. However:

- The rate of **"intermediate knowledge"** in this segment is around **1.7%**. Qualitatively, this suggests they may be **more consciously aware** compared to the other groups, despite their low numbers in the sample.

Expert Knowledge Level

The total proportion of those claiming to be **"EIA experts"** is only **1.2%** (19 individuals). This clearly indicates that **EIA awareness and expert knowledge are extremely limited** within the general population sampled.

GRAPH 3: Public Awareness Level of Seagrasses by Age Groups



Analysis and Interpretation (GRAPH 3)

General Trend

Seagrass awareness is **concentrated in the younger age groups** and **decreases significantly in older age brackets**.

18–25 Age Group: The Most Aware

The **18–25 age group** holds the largest share in awareness:

- Approximately **16%** of participants in this bracket showed **low awareness**.
- **12%** showed **intermediate awareness**.
- **3.4%** showed **high awareness**.
- However, simultaneously, **14.5%** were in the **very low awareness** category.

This suggests that a large proportion of young people are **aware** of the topic but may **lack in-depth knowledge**.

26–35 Age Group: Intermediate Awareness

The **26–35 age group** is the second tier for moderate awareness:

- The combined total for "Intermediate" and "Low" awareness is around **11%**.
- The rate for "High awareness" is only **0.76%**.

36–45 Age Group: Decline in Interest

Awareness rates in the **36–45 age group** are lower, with **"very high"** awareness levels being **non-existent**.

- A lack of interest or knowledge deficit in this age group is notable.

46 and Older Age Groups (46–55 and 56+)

- Awareness levels are generally low: rates across all categories are **below 4%**.
- Even the "very low" category shows a decrease, which might indicate **lower participation** in the survey by the older segment.

Summary of Findings

- **The young segment (especially 18–25) is the primary driver of seagrass awareness.**
- **Awareness decreases significantly with advancing age.**
- **Overall awareness level is low:** The total proportion of participants showing **"high"** or **"very high"** awareness is only about **7%**.

4. DISCUSSION

The study revealed that despite a **low level of seagrass awareness**, the **desire for conservation is high**. This suggests that the knowledge gap can be bridged through **awareness campaigns and education**. Furthermore, the **ambiguity in current legislation** leads to serious knowledge and policy gaps in implementation.

- **Revision of EIA Criteria:** The biological monitoring criteria within the Environmental Impact Assessment (EIA) process need to be revised to **explicitly include seagrasses**.
- **Addressing the Decline in Awareness:** The observed decline in awareness and prioritization with increasing age/experience must be addressed with targeted measures.
- **Water Quality Solutions:** Solutions must be developed to improve water quality.

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5. CONCLUSION and RECOMMENDATIONS

- **Legislative Clarity:** Seagrasses must be **explicitly defined** in the EIA Regulation, and concrete assessment criteria must be established.
- **Public Outreach: Educational and informational campaigns** should be conducted at local and national levels.
- **Protection Areas:** The current status of seagrasses must be **mapped** and they should be included in **conservation areas**.


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