A RESEARCH ON AWARENESS OF THE UNIVERSITY STUDENTS ON WATER RESOURCES AND WETLANDS: EGE UNIVERSITY, TURKEY SAMPLE

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Abstract

Nowadays, many studies are carried out local, national or international with cooperation aim at improving the awareness against the environmental problems such as destruction of water resources that we are facing. The education related to environmental issues to be effective in terms of raising awareness and transferring the life of the training received is reality. Education definitely can effectively contribute to struggle with the environmental problems and is a key instrument for raising awareness. From this point of view, the aim of this study is to reveal and increase the awareness of the landscape architecture students on water resources and wetlands who have lectures on environmental issues during their educational period. With this purpose, the study is considered in four main sections, namely, data collection, development of questionnaire form, findings, evaluation and synthesis. After an initial search of the literature, a questionnaire form that evaluates the awareness of the students on water resources and wetlands was prepared. In order to compare the awareness level, the questionnaire was conducted to 1st and 4th year students of Landscape Architecture of Ege University where the period of undergraduate study is four years. "Simple Random Sampling Method" was used in determination of the number of the students on which questionnaire would be conducted, 99 % confidence level and 0.05 sampling error were taken as basis in the calculations. In the calculation, according to the total number of students which is 171 that the sum of 96 first grade and 75 fourth grade students was used as "Population Size (N)" and the number of students on which questionnaire would be conducted was determined as 137 (77 first grade and 60 fourth grade) at the end. It was aimed at learning the students' awareness of the subject by means of these questions. The literature studies on the subject and the information found from the questionnaires were analysed and it was evaluated whether the education of four years on environmental issues has changed the opinions / awareness and the approach of the students to water resources and wetlands. Finally, recommendations to increase the awareness of the students were made.

Keywords: Landscape architecture, Wetlands, Public awareness, University students, Water resources, Turkey

1 INTRODUCTION
1.1 Definition, Classification and Importance

A wetland is an ecosystem that arises when inundation by water produces soils dominated by anaerobic processes, which, in turn, forces the biota, particularly rooted plants, to adapt to flooding (Keddy, 2010). Under the text of the convention wetlands are defined as in Article 1.1: Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres (Ramsar Convention Secretariat, 2013).

Within this broad definition, the wetland classification system used in the Directory Identifies 40 different wetland types in three categories (Environment Australia, 2001):
1. Marine and coastal zone wetlands
2. Inland wetlands
3. Human - made wetlands

The wetlands deliver a wide range of critical and important services vital for human well-being (Sonali Senaratna et.al, 2008) and these beneficial services, considered valuable to societies worldwide, are the result of the inherent and unique natural characteristics of wetland (EPA, 2001).

1.2 Ramsar Convention

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is "the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". As of October 2010, 160 nations have joined the Convention as Contracting Parties, and more than 1900 wetlands around the world, covering over 186 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International Importance (Ramsar Convention Secretariat, 2010).

The situation in Turkey

Turkey's water policy has undergone continuous reforms since the middle of the past century with significant changes occurring especially throughout the past three decades (Kibaroglu et. al, 2011). The Convention on Wetlands came into force for Turkey on 13 November 1994. Turkey presently has 14 sites designated as Wetlands of International Importance, with a surface area of 184,487 hectares (The Annotated Ramsar List: Turkey, 2014).

So in this context; this study in which the "A Research on Awareness of the University Students on Water Resources and Wetlands: Ege University, Turkey Sample" was put forward to reveal and increase the awareness of the landscape architecture students on wetlands who have lectures on environmental issues during their educational period.

2 METHODS

The main material of the research is the first and fourth grade students who are educating in Ege University Agriculture Faculty Landscape Architecture Department. The University is situated in Bornova, which is one of the biggest districts of Izmir. Various literary sources on the subject, internet information and the original questionnaire forms originally prepared for this study, notes taken during the discussions with the students are constitute of the other materials of the study.

The research method is composed of 4 main phases called as conceptual analysis, data collection about the topic, findings and evaluation and synthesis. After the conceptual analysis in which the definition and classification, the importance, national and international legislation, current situation in Turkey of wetlands, questionnaire form had been formed.

In the calculation of sample size of the questionnaire, the following method of Simple Random Sampling was used (Newbold, 1995) and a 99 % confidence level and 0.05 % sampling error was taken as the basis. Assistance was received from the Instructors of the Department of Agricultural Economy in the Faculty of Agriculture at Adnan Menderes University in the calculation of sample size of the questionnaire.

$$n = \frac{N\,p\,(1 - p)}{(N - 1)\,\sigma 2px + p\,(1-p)}$$

The total registered student number of for 2013 – 2014 education period in Ege University Agriculture Faculty Landscape Architecture Department for 2013 – 2014 educational period (171 that the sum of 96 first grade and 75 fourth grade students) was used as the "Population Size (N)" in the calculation, and, at the end of the calculation, the sample size of questionnaire was determined as 137 (77 first grade and 60 fourth grade).

General Director of Nature Protection and National Parks, 2013 were used in the preparation of the original questionnaire forms applied to the students. 33 closed - ended questions (grading - scale questions, compulsory-elective questions and demographic questions) under 3 headings, namely, general characteristics of the students joined the questionnaire, awareness of definitions and concepts related to topic, opinions and attitudes related to topic were posed to the respondents. The questionnaire was used to find out the opinions of learning the students' awareness of the subject by means of the available data. The aim of performing a questionnaire with two groups (77 students and 60 students in the fourth grade) is to compare the opinions of these students. The questionnaires were carried out by means of face-to-face interviews with students selected randomly from the Ege University Agriculture Faculty Landscape Architecture Department from 21 to 25 April 2014. SPSS (v.10) was used for statistical analysis of the data which are obtained from the

questionnaires, in the evaluation stage of the results and there had some suggestions were put forward on the topic in conclusion.

3 RESULTS AND DISCUSSION
3.1 Results

Questionnaire form was conducted to 1st and 4th year students of Landscape Architecture of Ege University in order to evaluate the awareness of the students (awareness of definitions and concepts and opinions and attitudes related to topic) on water resources and wetlands. Firstly, demographic structures of the students are determined. It is seen that 75 % of 1st year students and 77 % of 4th year students are girls (Table 1).

Table 1. General characteristics of the students joined the questionnaire

CLASS		1		4	
		%	n	%	n
SEX	Male	25	19	23	14
	Female	75	57	77	46
Total		**100**	**76**	**100**	**60**

When the awareness of definitions and concepts related to topic is evaluated, it is seen that 91 % of the 1st year students and 100 % of the 4th year students are aware of the wetland term and all of the 4th year students can define or partly define the term. However, most of them do not know the number of the wetlands which has international importance in Turkey (100 % of 1st class, 87 % of 4th class). Most of the 4th year students (88 %) know the Ramsar Convention. They don't have enough information about the quantity of the Ramsar sites in Turkey and in İzmir where their university is. 50 % of 1st year students and 43 % of 4th year students give the correct answer to the 11th question (Ministry of Forestry and Water Affairs) (Table 2).

Table 2. Awareness of definitions and concepts related to topic

	CLASS	1		4	
		%	n	%	n
1. Have you ever heard of wetland term?	Yes	91	69	100	60
	No	9	7	0	0
2. Can you define the wetland term?	Yes	15	11	53	32
	Partially	72	55	47	28
	No	13	10	0	0
3. Do you know the functions and values of wetlands?	Yes	4	3	64	38
	Partially	59	45	33	20
	No	37	28	3	2
4. Do you know how many wetlands have international importance in Turkey?	Yes	0	0	13	8
	No	100	76	87	52
5. If your answer is yes for the 4th Question, how many?		0	0	5	3+
6. Have you ever heard of the Ramsar Convention?	Yes	5	4	88	53
	No	95	72	12	7
7. Do you know how many Ramsar Site are there in Turkey?	Yes	0	0	15	9
	No	100	76	85	51
8. If your answer is yes for the 7th Question, how many?		0	0	8	5+
9. Do you know any Ramsar Site in Izmir?	Yes	0	0	42	25
	No	100	76	58	35

10. If your answer is yes for the 9th Question, what is its name?		0		37	22+
11. In which ministry is it the authority and responsibility of wetlands?	Ministry of Energy and Natural Resources	9	7	3	2
	Ministry of Forestry and Water Affairs	50	38	43	26
	Ministry of Environment and Urbanization	36	27	52	31
	Ministry of Food, Agriculture and Livestock	5	4	2	1

Most of the 1st year students agree and the 4th year students completely agree that the wetlands are important ecosystems (61% for both classes) and they have multi way functions and values. Most of the 4th year students have the opinion that the measurements for protection and National / International legislations for wetlands are inadequate (53 % and 58 % respectively) (Table 3).

Table 3. Opinions and attitudes related to topic I

CLASS		1										4									
Please indicate your thoughts on the following propositions		Completely Disagree		Disagree		Undecided		Agree		Completely Agree		Completely Disagree		Disagree		Undecided		Agree		Completely Agree	
		%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
1	Wetlands that brings the living environment together are important ecosystems	0	0	0	0	18	14	61	46	21	16	0	0	2	1	2	1	35	21	61	37
2	Wetlands are areas that have multi way functions and values	1	1	0	0	21	16	65	49	13	10	0	0	0	0	2	1	37	22	61	37
3	The importance of wetlands is known enough	17	13	32	24	21	16	21	16	9	7	15	9	53	32	17	10	10	6	5	3
4	The measurements for protection of wetlands are adequate	24	18	39	30	32	24	5	4	0	0	27	16	58	35	13	8	2	1	0	0
5	National / International legislations for wetlands are adequate	19	14	26	20	47	36	8	6	0	0	7	4	40	24	43	26	10	6	0	0
6	Drying of the marshes has necessity for public / urban health	16	12	17	13	26	20	30	23	11	8	25	15	35	21	17	10	18	11	5	3

Direct uses, indirect uses, social and cultural values of the wetlands are listed in order to learn the knowledge level of the students on the usage of wetlands. It can be seen that most of the 1st year students have partially information about the use of wetlands while the 4th year students have. Especially social and cultural values are known better when compared to direct and indirect use values (Table 4).

The most important environmental problem of wetlands is found as water pollution for both of the classes (41 % and 50 % respectively) (Table 5). 4th year students have rated solid wastes and the death of live afterwards (43 % and 40 % respectively) while the 1st year students find the death of live (33% more important than the solid wastes (27 %) problems (Table 5).

Table 4. Opinions and attitudes related to topic II

CLASS		1						4					
Do you have any information about the use of wetlands?		Yes		Partially		No		Yes		Partially		No	
1	**Direct Use Value**	%	n	%	n	%	n	%	n	%	n	%	n
1.1	Creating wildlife habitat	33	25	47	36	20	15	65	39	32	19	3	2
1.2	Water supply	24	18	47	36	29	22	35	21	38	23	27	16
1.3	Salt production	21	16	50	38	29	22	30	18	40	24	30	18

No		Class 1						Class 4					
		%	n	%	n	%	n	%	n	%	n	%	n
1.4	Aquaculture production	34	26	41	31	25	19	49	29	33	20	18	11
1.5	Agriculture and livestock	46	35	32	24	22	17	42	25	35	21	23	14
1.6	Reed harvesting	24	18	43	33	33	25	40	24	40	24	20	12
2	**Indirect Use Value**												
2.1	Regulatory of water regime	29	22	45	34	26	20	52	31	35	21	13	8
2.2	Stabilization of coastline and the conservation of delta	26	20	43	33	31	23	56	34	32	19	12	7
2.3	Reducing of the impact of storm and flood	21	16	42	32	37	28	33	20	47	28	20	12
2.4	Regulatory of climatic conditions in where	33	25	42	32	25	19	52	31	38	23	10	6
2.5	Water cleaning	32	24	42	32	26	20	45	27	43	26	12	7
2.6	Biological production	40	30	38	29	22	17	57	34	35	21	8	5
2.7	Biological diversity	38	29	38	29	24	18	75	45	22	13	3	2
2.8	Control of climate change in global dimensions	27	21	40	30	33	25	50	30	40	24	10	6
3	**Social and Cultural Value**												
3.1	Tourism and recreation	33	25	45	34	22	17	80	48	17	10	3	2
3.2	Landscape aesthetics	42	32	36	27	22	17	82	49	18	11	0	0
3.3	Cultural heritage and identity	26	20	45	34	34	22	78	47	22	13	0	0
3.4	Usage for scientific research and education	33	25	41	31	26	20	71	43	22	13	7	4

Table 5. Opinions and attitudes related to topic III

CLASS		1										4									
What are the most important environmental problems in wetlands?*		1		2		3		4		5		1		2		3		4		5	
		%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
1.	Water pollution	41	31	13	10	13	10	7	5	25	20	50	30	17	10	18	11	5	3	10	6
2	Solid wastes	27	21	21	16	18	14	21	16	13	9	43	26	30	18	7	4	7	4	13	8
3	The death of live	33	25	20	15	16	12	18	14	13	10	40	24	23	14	22	13	5	3	10	6
4	Visual pollution	20	15	14	11	24	18	25	19	17	13	15	9	30	18	23	14	22	13	10	6
5	Combating insecticide	23	17	17	13	24	18	18	14	18	14	20	12	20	12	25	15	25	15	10	6

* Please rate as "1" the most important, "5" the least important

When the precautions for conservation and sustainability of wetlands are questioned, 1st year students have the opinion that the awareness of the people should be raised (54 %) while the 4th year students mostly think that the national and local policies should be developed or strengthened (72 %) and similar to the 1st year students, 4th year students also give importance to the awareness of people on wetlands conservation and sustainability (67 %).

Table 6. Opinions and attitudes related to topic IV

CLASS	1										4									
What should be done about wetlands conservation and sustainability?*	1		2		3		4		5		1		2		3		4		5	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n

1	National and local policies should be developed / strengthened	42	32	13	10	17	13	6	4	22	17	72	43	8	5	0	0	5	3	15	9
2	People should be aware of this issue	54	41	7	5	5	4	9	7	25	19	67	40	5	3	3	2	12	7	13	8
3	The environment - wetlands - consciousness must be handled better in pre-university education	30	23	18	14	21	16	11	8	20	15	56	34	17	10	7	4	5	3	15	9
4	Criminal sanctions for wetlands polluting should be increased	25	19	17	13	21	16	18	14	18	14	53	32	20	12	8	5	4	2	15	9
5	The measures that prevent the wetlands to be converted to a different usage should be taken	27	21	21	16	20	15	12	9	20	15	53	32	15	9	8	5	5	3	19	11
6	Legislation should be implemented	34	26	16	12	17	13	11	8	22	17	58	35	15	9	7	4	7	4	13	8

* Please rate as "1" the most important, "5" the least important

3.2 Discussion

As it is mentioned, wetlands are important ecosystems with their ecologic, economic, social and cultural values. They have properties that make them unique among the major ecosystem groups on Earth. Wetlands are among the most biologically productive ecosystems on the planet (Kadlek & Wallece, 2009). Although they have such importance, there is still a perception that it is not given enough importance that they deserve. In this context, people should be informed about the values, uses, importance of wetlands. Wetlands should be protected and managed well. Laws and legislations should be implemented, national / local policies should be developed. This can only be provided by raising the consciousness of people by long life learning. In this context the environment - wetlands - consciousness must be handled better in pre-university and university education.

In this study, it can be easily said that students of landscape architecture enhance their knowledge on wetlands during their undergraduate education and become more self-aware on the importance of wetlands.

It can be seen from the results that, although the knowledge of 4th year students has enhanced more on uses of wetlands in general when compared with the 1st year students, direct and indirect uses of wetlands are not distinguished as social and cultural values of wetlands. During the education, direct and indirect uses have to be emphasized.

Especially 1st year students have the thought that drying of the marshes has necessity for public / urban health as 41 % of them agree or completely agree to the proposition and 26 % of them are undecided. These results have decreased in 4th year students that totally, 23 % of them agree or disagree and 17 % is undecided. This shows that although there is a decrease in results due to their education, there is still a negative perception against the wetlands even thinking of drying. This can be the results of having mostly theoretic information about the wetlands in their courses. As it can be seen from the results that students in general do not have enough information about the wetlands around their surroundings. While the field trips as complex learning settings that enable binding the curriculum to the environment and combining cognitive and affective aspects of learning (Tal, 2001), a field trip to these areas will be useful to inform them about the importance and uses of wetlands.

4 CONCLUSIONS

As a conclusion, wetlands are areas that should be protected and managed well. Their importance for the environment should be well taught and this can be provided by raising the consciousness of wetlands during the education life.

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