EXAMINATION OF SECONDARY SCHOOL STUDENTS' VIEWS ON ENVIRONMENTAL ISSUES

(Research article)

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Abstract

In the realization of an effective environmental education, the opinions of secondary school students about environmental problems are considered important. Therefore, the general purpose of the research is to determine the opinions of secondary school students about environmental problems by using the cartoons drawn by the students. The study group of the research consists of 28 students studying in primary education second grade in the 2020-2021 academic year. The research is a case study conducted with a qualitative research approach. The findings of the research were analyzed by content analysis. According to the results of the research, the students stated that the most important environmental problem was pollution. Students stated that environmental pollution, air pollution, garbage problem, wastes, water pollution, deforestation, depletion of natural resources were the first among environmental problems. According to the other finding of the study, the students mostly mentioned the individual responsibilities that people should fulfill in solving environmental problems. Based on the results of the research, a lesson that can be taught at all levels starting from secondary school be created under the name of environmental education, in which applied activities will be mainly included.

Keywords: Environmental issues, environmental education, environmental awareness, environmental sensitivity, secondary school students

1. Introduction

Environment is defined as all physical and biological external conditions with which people interact in their lives and economic activities (Kotlyakov & Komarova, 2007). Environmental problems that threaten the future of human beings, who constantly struggle with the environment and change the environment, arise as a result of this struggle and changes (Alım, 2014).

Environmental problems are an important global problem that is still being discussed around the world and threatens humanity. Our world is increasingly affected by environmental problems. Air pollution, global warming, climate change, greenhouse effect, acid rain and ozone depletion are some of the major environmental problems (Myers, Boyes, & Stanisstreet, 2004). On the other hand, rapid industrialization and unplanned urbanization, artificial fertilizers, increasing world population, widespread use of chemicals such as nuclear tests, pesticides, and cleaning products cause ecological balance to deteriorate and a decrease in living species (Çokadar, Türkoğlu, & Gezer, 2009). In particular, there are three major environmental issues that have local, regional and global impacts on the future health of the planet. These three problems are the loss of forest cover, the increase of the human population that exceeds the carrying capacity of the Earth, and the widespread pollution caused by humans (Mahler, 2020). Thousands of scientific articles have been written measuring the amounts of pollution and its effects on people and the environment. A recent comprehensive report from the Lancet Commission shows that pollution is the biggest cause

of human illness and premature death on planet Earth (Lancet Commission, 2017). This report estimates that pollution causes more than 9 million premature deaths per year. More than 90% of these premature deaths occur in poor countries. The Lancet Commission concluded that human-induced pollution causes decline in human, animal and plant health, destroys ecosystems and is linked to climate change. Especially air and water pollution are the leading ones (Mahler, 2020). As can be understood from the results of the research, environmental problems have begun to have serious consequences and have reached a dangerous level for all living things. At this point, the necessity of environmental education emerges. In order to solve environmental problems, researchers emphasize the necessity of helping people to raise awareness through environmental education in schools to protect the environment (Alım, 2014; Teksöz, Şahin & Ertepınar, 2010). Environmental education is closely related to individuals' attitudes and behaviors towards the environment and related problems (Tilbury, 1995). "Environmental education" is an important education in order to reduce existing and future environmental problems and to prepare individuals against environmental problems that will occur (Atasoy & Ertürk, 2008). According to Aldrich and Benjamin (1997), environmental education will make a significant contribution to understanding and solving environmental problems. The focus of environmental education programs has been to ensure that attitudes towards the environment are changed positively by increasing the knowledge about the environment (Pooley & O'connor, 2000). In other words, environmental education underlies the society's sufficient knowledge and consciousness about the environment, ensuring sensitive and positive behavioral changes, protecting the natural environment and regaining the damaged environment. However, it is not possible to say that the basic ecological knowledge given in the content of environmental education always improves environmental awareness and related behavioral patterns in individuals (Kuhlemeier et al. 1999; Pooley and O'Connor, 2000; Schmidt 2007). Özdemir (2010) states that although students' knowledge of the environment increases during their school life, their positive attitudes towards the environment do not increase to that extent. The concept of environmental education is not only with knowledge; Besides, it is related to values, attitudes, ethics and actions (Davis, 1998). In order to raise people who are sensitive to the environment, an education system that actively participates in the environment and reacts against adversities should be developed. Care should be taken to raise people who are respectful to each other and have human values. In this way, it can be ensured that all elements of the environment are fully and accurately known and the environment is protected (Glover & Deckert, 1998). Şimşekli (2004) emphasizes that teachers should be role models in environmental issues in order to raise awareness about environmental protection.

In the related literature, there are studies on environmental attitude, awareness, sensitivity, environmental awareness and environmental problems (Pooley, O'Connor, 2000; Şimşekli, 2004; Alım, 2014; Schmidt, 2007; Negev, Garb, Biller, Sagy & Tal, 2010; Göl, Saymalı, and Karaca, 2016; Zachariou, Voulgari, Tsami & Bersimis, 2020; Karagözoğlu, 2020; Nacaroğlu and Bozdağ, 2020) about teachers (Summers, Kruger & Childs, 2000), about teacher candidates (Aydın, 2010; Erol & Gezer, 2006; İbiş, 2009; Doğan and Simsar, 2018; Mahler, 2020); about students (Sadık, Çakan, & Artut, 2011; Seçgin, Yalvaç, & Çetin, 2010; Çalış & Balcı, 2016); Ertürk, 2017; Sağsöz and Doğanay, 2019; Zachariou, Voulgari, Tsami, & Bersimis, 2020). There are a limited number of studies (Ersoy & Türkan, 2010; Yalçınkaya, 2013;) on the examination of students' views on environmental problems through cartoons in the literature. In order to provide an effective environmental education to individuals and to develop environmental awareness, it is important to determine their prior knowledge and perceptions about the environment and their attitudes towards the environment by conducting research studies at all levels of education (Duvall & Zint, 2007). Yücel and Morgil (1998) stated that the concept of environment should be educated consciously in education programs

that continue from primary education to university and individuals. The researchers emphasized the importance of environmental education in the primary education period, emphasizing that raising individuals who are sensitive and conscious of environmental and environmental problems starting from the preschool period continues in primary and secondary education (Metin, 2010; Gülay & Ekici, 2010). Especially the knowledge, skills and values to be acquired in primary and secondary education form a basis for higher education levels. This study aims to determine the opinions of secondary school students about environmental problems by using the cartoons drawn by the students. It is thought that this study will help to determine the emotional thoughts of students who are the adults of the future towards environmental problems, which have gained a global dimension, and to help restructure environmental education programs. In line with this general purpose of the research, the following questions were sought:

What are the most important environmental problems according to secondary school students?

What are the main causes of environmental problems according to secondary school students?

What are secondary school students' suggestions for solutions to environmental problems?

What are the slogans secondary school students produce about environmental problems?

What are the environmental problems that secondary school students reflect on their cartoons?

2. Method

In this section, information is given about the research model, the study group of the research, data collection and data analysis.

The research is a case study conducted with a qualitative research approach. According to Büyüköztürk (2010), qualitative research is a method used to collect detailed and in-depth data, to directly learn the personal perceptions, experiences and perspectives of the participants, and to understand and explain current situations. The general purpose of the research is to determine the opinions of secondary school students about environmental problems by using the cartoons drawn by the students.

2.1. The working group of the research

The working group of the research consists of 28 students attending 5.6.7.8. grade in the academic year 2020-2021.

The study group of the study was chosen according to the convenience sampling. This sampling method provides practicality to the research. In the sample that is easily accessible, the researcher chooses a group that is close to him and easy to reach (Yıldırım & Şimşek, 2006).

2.2. Data Collection and Analysis

In this study, data were collected through semi-structured interviews to determine secondary school students' views on environmental problems. Semi-structured interviews are in-depth interviews and give the interviewer flexibility to explore details or further answers. A semi-structured interview consists of open-ended questions predetermined according to subject areas. Some other questions can be formed during semi-structured interviews

(Creswell, 2009). In this study, an environmental problems interview form consisting of open-ended questions was used as a data collection tool. The data collection tool used in the study was developed by the researchers and was checked by a Turkish teacher to check that the form was understandable. It was checked by two different faculty members to ensure the scope validity. Corrections were made according to the experts' suggestions to change some expressions. These questions were asked to 3 students and a pre-application was made. As a result of the pre-application, it was seen that the questions were understood correctly by the students, only minor changes were made in the way the questions were expressed. The data collection tool consists of 4 open-ended questions in its final form. The literature was used while preparing these questions. Before the interviews, the students were informed about the aims of the study by the researcher and invited them to participate in the study. In addition, the cartoons drawn by the students were used. Secondary school students were asked to draw a cartoon about environmental problems and to express the cartoons they drew. Each meeting lasted about 60 minutes. All interviews were recorded and transcribed word for word. In this study, "variation" was used to ensure the validity and reliability of qualitative data. Diversification is the totality of efforts to increase the credibility of research results by making use of different data sources, different data collection and analysis methods (Yıldırım and Şimşek, 2005: 94). Interviews were held with the students to ensure the validity of the study, and the students drew cartoons about environmental problems. Thus, the findings obtained from each were analyzed comparatively. The drawings made by the children provide a rich source of data for research as personal narratives. Drawings made by children, especially in the field of psychology and psychotherapy, have been used in recent years to understand children's knowledge and experience and their world from their perspective (Leitch, 2008).

The data obtained from the students were first coded as S1, S2, S3… in order to protect participant privacy. Afterwards, these coded data were analyzed by content analysis. Content analysis systematically provides a scientific method for interpreting raw data using deductive or inductive approaches. Using a deductive approach, the researcher examines the data by applying existing codes or categories in the literature. On the other hand, with an inductive approach, the researcher derives codes, themes and categories directly from the data (Marshall & Rossman, 2006). In this study, data were analyzed through content analysis in order to get in-depth information about secondary school students' views on environmental problems. First of all, the interviews were written down and written documents were created. These written documents were then coded, and in this way themes and categories were created by induction.

In order to ensure the reliability of the results of this study, direct quotations from the interviews of the participants were given in an identical way. In order to ensure the reliability of the study, the formula of Miles and Huberman (1994) (Reliability coefficient = Agreement ÷ (Agreement + disagreement) x 100) was used. During the coding, if the researchers specified the same codes, it was evaluated as "consensus", and if they specified different codes, it was evaluated as "disagreement". The data obtained in the study were coded by two researchers, and then the codes (descriptions) and sub-themes were determined using the "consensus" formula. A consistency of 85% was achieved in the reliability study performed for this research. Since the value is above 70% (Yıldırım & Simsek, 2013), it can be said that the reliability of the data is ensured.

2.3. Ethics Committee Permission

Scientific research processes were carried out in a healthy manner from the beginning to the end of this study, the data were collected on a voluntary basis, and the necessary ethical conditions were fulfilled by referring to the necessary institutions and persons in all quotations. Informed consent / consent form was obtained from the interviewees. Board Name: Kastamonu University Rectorate Social and Human Sciences Ethics Committee Decision date: 18.02.2021 Session No: 021.1.1.

3. Findings

Table 1 includes findings on the most important environmental questions for secondary school students.

Tablo 1. *The most important environmental issues for secondary school students.*

Category	Code	Frequency	%
Pollution	Environmental pollution	9	21
	Air pollution	6	14
	Garbage problem	4	9,3
	Wastes	3	7
	Water pollution	3	7
	Soil pollution	2	4,6
	Noise pollution	1	2,3
Climate change	Global warming	2	4,6
	Drought	2	4,6
	Desertification	1	2,3
Destruction of naturel resources	Deforestation	5	11,6
	Fires	1	2,3
	Depletion of naturel resources	2	4,6
	Extinction	2	4,6
	Total	43	100

As seen in Table 1, the environmental problems that students see as important; pollution, climate change, destruction of natural resources. Students stated the most important environmental problem as pollution. Students stated that environmental pollution, air pollution, garbage problem, wastes, water pollution, deforestation, depletion of natural resources were the first among environmental problems. S23 '*We do not keep our environment clean enough.*' S14 *coded student says; 'People throwing garbage and cutting down trees is an important environmental problem.*' S17 '*When we pollute the environment, not only the environment but also the animals' nests are destroyed. People do a lot of harm to the environment, they can do this with plastic waste or anything, and recycling is not much.*' They drew attention to how people harm the environment with their sentence. It can be said that students focus on environmental problems they see in their close environment rather than global environmental problems.

Tablo 2. *Student views on the main causes of environmental issues*

Category	Code	Frequency	%
Caused by people's attitude	Garbage dumped in nature	8	20
	Destroying nature	5	12,5
	Unconsciousness	4	10
	Insensitivity	3	7,5
	Irresponsibility	3	7,5
	Wasting water	2	5
	Disrespect for nature	1	2,5
	Disregard for nature	1	2,5
	Worthless for the environment	1	2,5
Due to urbanization	Unplanned urbanization	2	5
	Rapid population growth	2	5
	Exhaust gases	2	5
Industry sourced	Failing to install filters in factories	3	7,5
	Waste dumping into the sea	2	5
	Unplanned industrialization	1	2,5
	Total	40	100

As seen in Table 2, environmental problems according to students; it emerges from people's attitude, urbanization and industry. We can say that students think that the main causes of environmental problems are human-induced. It is thought that human-induced factors are mostly caused by the garbage disposed of by people to the nature, the unconsciousness, insensitivity, irresponsibility of people and their disregard for the environment. As a matter of fact, while S2 said "*People throwing garbage on the streets, in short, people create this problem*", S28 "*People's irresponsible behaviors continue to throw garbage on the ground and cut down trees.*" S20 coded student's words "*People's indifference, they should not throw garbage on the floor and not pollute the air*" draws attention to people's attitude towards environmental problems. Another factor that causes environmental problems is unplanned urbanization due to urbanization, rapid population growth, and exhaust gases. On the other hand, the students stated the environmental problems caused by the industry as not installing filters in factories, spilling wastes into the sea, and unplanned industrialization. In addition, S15 *"... I think all of them are from the polluted air coming out of factory chimneys ..."* S8, with his statement as *"Not installing filters in factories, spilling factory wastes into the sea, and people not being sensitive and respectful to nature",* he expresses the negative effects of industrialization in the formation of environmental problems.

Tablo.3 Solutio*n suggestions of students for environmental issues*

Category	Code	Frequency	%
Individual responsibilities	We should not pollute the environment	12	26,6
	We shouldn't waste water	4	8,8
	We must use recycling bins	3	6,6
	We must use public transport	3	6,6
	We should plant trees in nature	3	6,6
	We must be sensitive to the environment	1	2,2
	We must respect living things	1	2,2
	We must be more careful with the environment	1	2,2
	We must be a conscious person	1	2,2
	We need to protect the environment	1	2,2
	People should act responsibly	1	2,2
Legal responsibilities	Factories must be equipped with filters	7	15,5
	people should be warned	4	8,8
	people should be punished	3	6,6
	Total	45	100

As seen in Table 3, students' solution suggestions for environmental problems are gathered under the categories of individual responsibilities and legal responsibilities. The students mostly mentioned the individual responsibilities that people should fulfill in solving environmental problems. In the category of individual responsibilities, there are suggestions such as not polluting the environment, not wasting water, should use recycling bins, use public transportation, plant trees in nature and be environmentally friendly.

Below are the expressions that students' solution suggestions for environmental problems are exemplified:

S6 We must be sensitive to the environment and not pollute. People need to be more careful with the environment.

S10 We should use public transport instead of our own cars, not to get dirty.

S18 We should not waste water in vain. We must use photocell taps.

S24 We have to warn people, collect the trash and be a conscious person.

S3 My solution proposal: people who harm the environment should be warned or punished.

S11 We should not do activities such as car washing and street washing, and those who do should be punished "

S26 Factory chimneys and car exhausts should be fitted with a filter

It is seen that students emphasize the development of environmental awareness and sensitivity. In the category of legal responsibilities to be fulfilled in solving environmental problems, there are suggestions of students such as installing filters in factories, warning and punishing them. The students drew attention to the necessity of applying legal sanctions as a solution to environmental problems.

Tablo.4 Slogans Produced by Students

Slogans	Students
The future also has a right to see the world	S1
If you want to live, keep the environment clean	S2
Please don't litter	S3
We must protect our environment, both for us and for other living things.	S5
Let's keep the environment clean, obey the rules, warn those who do not obey	S7
Protect nature protect animals	S8
Let's keep our nature clean and shed light on the future	S9
Don't waste water, let's not dry the world	S11
Let's pay attention to our environment, let's put the signs	S12
Take care of my surroundings for a beautiful tomorrow	S13
Clean Environment is a Sacred Life	S14
We protect ourselves if we protect the environment	S16
Do not pollute the environment, do not hinder your life	S17
I don't throw garbage on the floor, don't you too	S18
Let's keep our environment clean like our home	S20
Let's join hands for a clean world.	S21
Protect the environment, guarantee your future	S22
Let's keep our environment clean and protect our health.	S23
For Each Area You Pollute, Think One Year Ahead!	S24
The future also has a right to see the world	S25
If you want to live, keep it clean	S26
Please don't litter	S27
Environment is our mother	S28

Table 4 contains the slogans produced by the students regarding environmental problems. 5 of the students could not produce any slogan about the environmental problem. It can be said that most of the slogans produced by the students are about keeping the environment clean and protecting. As a matter of fact, the student coded S9 stated that we should keep our nature clean, let's shed light on the future. S2 coded student stated that if you want to live, keep the environment clean. In their slogans, it is seen that the students especially emphasize that protecting the environment is vital for our lives and our future.

Tablo.5 *Environmental issues reflected on students' cartoons*

Category	Code	Frequency
Garbage problem	16	39
Air pollution	7	17
Water pollution	4	9,7
Deforestation	4	9,7
Drought	3	7,3
Extinction	3	7,3
Soil pollution	1	2,4
Noise pollution	1	2,4
Global warming	1	2,4
Unplanned urbanization	1	2,4
Total	41	100

As seen in Table 5, environmental problems reflected in students' cartoons are mostly followed by garbage problem, air pollution, water pollution, deforestation, drought, extinction, soil pollution, noise pollution, global warming, unplanned urbanization. In summary, it can be said that the environmental problems reflected in the students' cartoons are mostly related to the pollution of the environment. In addition, it was found that some of the students depicted more than one environmental problem in their drawings. On the other hand, it is seen that students reflect the environmental problems at the local level more on their drawings, while it is seen that they reflect the problems such as global warming less on their drawings. Some of the students' cartoons about environmental problems, what they want to tell in the cartoons they drew, why they chose this problem and what your suggestions for solutions are given below.

Figure 1. S18 coded student

In the cartoon drawn by the student coded S18, in the dialogue between Fatma and Ali, it is told that the smoke from the factory polluted the air, the trees dried up, the factory wastes polluted the water, and the animals died because of this. He explained the reason for drawing this cartoon as *"People do not value nature, they pollute nature"*. The student draws attention to the importance of developing environmental awareness. It can be said that this cartoon reflects many environmental problems such as air pollution, water pollution, environmental pollution, the destruction of trees and the extinction of living things.

Figure 2. S24 coded student

S24 coded student mentioned the problem of garbage and water pollution in the cartoon he drew. In the cartoon he drew, he stated that he wanted to tell the speech of two people who warned a child who threw the packet of the food he had eaten into water and nature and made him realize that he was making a mistake. He stated the reason for drawing this picture as "*The people in the region where we live are polluting the nature, so there are a lot of*

unconscious people". It is seen that he stated that the environmental problem is human-induced and caused by people's unconscious behaviors. S24 stated that for the solution of this problem, it is necessary to *"Warn people, collect the waste and be a conscious person".* As can be seen in the cartoon, it is seen that he acts responsibly by warning the child throwing garbage.

Figure 3. S17 coded student

S17 draws attention to environmental pollution by using a humorous style in his caricature. In the cartoon, while one person says *"Why don't people throw the garbage in the recycling bin?",* in the other bubble a bird says *"Oh oh people".* The student stated that he wanted to explain environmental pollution in the cartoon he drew. He stated the reason for drawing this picture as *"Not only us but animals are affected by environmental pollution, and I have obtained such a cartoon to indicate this".* He expressed his solution proposal for this problem as *"They should not throw garbage in places but throw it into recycling, so we will prevent environmental pollution".* In addition, it shows that the waste bins prepared for paper, glass and plastic wastes included in the cartoon suggest recycling for the solution of environmental problems of the student.

Figure 4. S28 coded student

S28 draws attention to the garbage problem and water pollution by using a humorous style in his caricature. A person fishing in the cartoon, *"I guess this is our 10 millionth trash? "We kept a garbage today,"* he says. It can be seen in the picture that the buckets next to it are full of garbage. The student explained what he wanted to tell in his caricature as *"I mentioned*

that the garbage thrown in the sea does not end and harms the creatures in the sea". He stated the reason for choosing this problem as *'because living beings in the world almost every day die'.* With the cartoon he drew, the student wanted to emphasize that the garbage people threw away harmed the living things in nature.

Figure 5. S28 coded student

In the cartoon of the student coded S28, deforestation and the problem of garbage are explained. In the picture, it is seen that there are masks thrown on the floor, plastic bottles, and cut trees. He explains what he wants to tell in the student caricature as "*because people hurt themselves by throwing garbage on the ground and cutting down trees and I wanted to explain this with cartoons.''* It is shown with the sullen face that he is sorry that nature has become this. In addition, it is seen that he is disappointed with the environment he imagined and the situation he saw. He explained his solution proposal for this problem as "*People who harm the environment should be warned or punished".* The student emphasized that legal sanctions are necessary to solve environmental problems.

Figure 6. S26 coded student

S26 coded student touched on air pollution in the cartoon he drew. In the cartoon, he stated that the exhaust fumes of cars and factory fumes pollute the world. The reason for choosing this problem is "*Air pollution is a very bad thing and of course other environmental problems." Lots of people get sick and die because of air pollution. In addition, air pollution pollutes our world and a whole lot more ... ".* In his cartoon, it is seen that he wants to draw attention to the subject by showing the world as sick from air pollution and uploading a human characteristic to the world. He explained the solution proposal for this problem as

"Public transportation vehicles should be used, a filter should be installed in factory chimneys and car exhausts, and natural gas should be used for heating purposes in homes, not coal". It can be said that he is conscious about the measures to be taken to reduce air pollution.
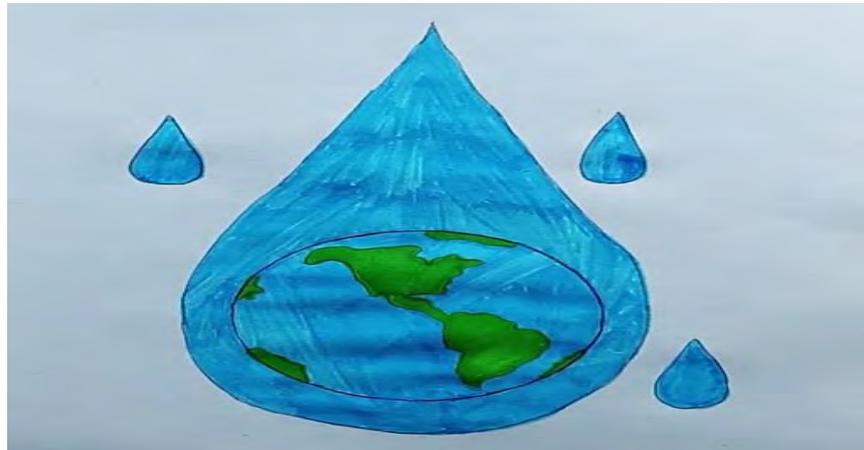

Figure 7. S11 coded student

S11 coded student explained what he wanted to tell in the cartoon as *"Water is needed to prevent drought and I wanted to explain that there is no life without water"*. In the cartoon he drew, he stated why he chose this problem as "*because people behave really unconsciously about this subject, they need to be a little responsible and know that water is a life.*" In order to solve this problem, S11 coded student suggested that people should not spend water in vain, use photocell taps, do not perform activities such as car washing, street washing and that those who do so should be fined. In this cartoon, the student drew attention to the drought problem that awaits people in the future. It is also seen that he emphasizes that the problem stems from the attitude of the people.

Figure 8. S23 coded student

In the cartoon of the student coded S23, it is seen that he reflects many environmental problems such as air pollution, water pollution, garbage problem, cutting down trees. In the cartoon, the exhaust fumes of cars, factory fumes, factories pouring their dirty wastes into the sea, cutting down trees are described as environmental problems. In the cartoon, the student drew that a boy threw his garbage on the ground, and at the same time expressed similar behavior in other people by saying *"Everyone is throwing garbage on the floor, so what?"* The student draws attention to the irresponsible behavior of people in the cartoon. He explained that the reason for choosing this problem is to explain the importance of

environmental pollution. He explained his solution proposal for this problem as *"installing filters in the chimneys of factories and people acting responsibly"*. The student emphasizes the development of environmental awareness.
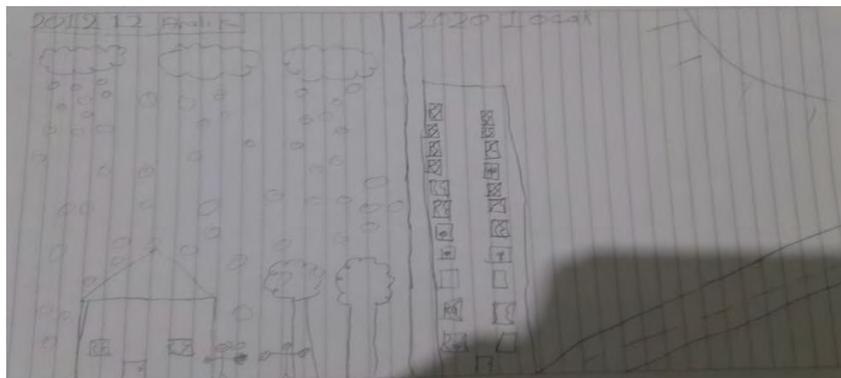

Figure 9. S10 coded student

S10 stated that he wanted to explain global warming and unplanned urbanization in his cartoon. He explained this problem by comparing the past and present. In his caricature, he draws that it rained in the past and there were green areas, while today there is a drawing showing that roads and high-rise buildings are built instead of green areas and it is no longer raining. He explained the reason for choosing this problem as *"because this is not like other problems, it is a problem that can end life"*. He stated his solution proposal to this problem as *"Of course, we should pollute the nature less, plant trees, install filters in factories and prefer collective vehicles"*.

4. Discussion and Conclusion

In this study, which was conducted in order to determine the emotions, thoughts and observations of secondary school students about environmental problems by using the cartoons they drew, they expressed the environmental problems that are important for secondary school students in different ways. According to the research findings, it can be said that students are aware of environmental problems. According to the results of the research, the students stated that the most important environmental problem was pollution. Students stated that environmental pollution, air pollution, garbage problem, wastes, water pollution, deforestation, depletion of natural resources were the first among environmental problems. There are studies with similar results in the literature. In the study conducted by Yalçınkaya and Çelikbaş (2013), it was seen that the most important environmental problem was "environmental pollution" when looking at the frequency of middle school students' answers. In the study conducted by Yazıcı and Utkugün (2019) to determine the opinions of 7th grade students on environmental problems, it was concluded that the most important environmental problems were air pollution, water pollution, garbage pollution and environmental pollution. In the research conducted by Çobanoğlu and Demirtaş, Ozan and Bayrak (2006), air pollution ranks first. In a study conducted by Yalçınkaya (2013) on 8th grade students, it is stated that the most important environmental problems are garbage problem, air pollution, deforestation and water pollution.

Considering the findings of the research on the causes of environmental problems, according to middle school students, environmental problems; it emerges from people's attitude, urbanization and industry. We can express that students think that the main causes of environmental problems are human-induced. It is thought by the students that human-induced factors are mostly caused by the garbage disposed of by people to the nature, the destruction

of nature by people, their unconsciousness, insensitivity, irresponsibility, and disrespect and disregard for the environment. There are studies with similar results in the literature (Yazıcı & Utkugün, 2019; Yardımcı & Bağcı Kılıç, 2010; Seçgin, Yalvaç, and Çetin 2010; Özcan & Demirel, 2019). According to the research findings made by Karagözoğlu (2020), the most important causes of environmental problems are lack of education, unconsciousness and insensitivity to the environment. Özcan and Demirel (2019) stated in their study, in which they investigated the cognitive structures of middle school students related to environmental problems, they mostly showed people as the causes of environmental problems in their drawings. In order to protect the environment we live in, it is important to be aware of our responsibilities as an individual and as a society. Individuals' attitudes towards the environment are also important. Uzun and Sağlam (2006) stated that people who have a negative attitude towards the environment will remain insensitive to environmental problems and even continue to create problems for the environment. Ayvaz (1998) stated that there is a relationship between environmental awareness and environmental awareness and it is necessary to inform about what is harmful to the environment. It is possible to develop environmental awareness in individuals by gaining environmental awareness. Increasing environmental awareness to individuals will be achieved through environmental education that will be given at all levels. In Article 9 of the Environment Law, '' It is essential to include environmental issues in the education programs of formal education institutions affiliated to the Ministry of National Education, starting from pre-school education, in order to protect the environment and develop environmental awareness in the public. With regard to non-formal education, it is essential to include programs on the importance of the environment and the development of environmental awareness in radio and television programs. " It is seen that with the statement, the necessity of environmental education is emphasized. With an effective environmental education, raising awareness of the society will be possible with a permanent behavioral change that will take responsibility in the solution of environmental problems.

According to the other finding of the study, the solution suggestions of the students for environmental problems were collected under the categories of individual responsibilities and legal responsibilities. The students mostly mentioned the individual responsibilities that people should fulfill in solving environmental problems. In the category of individual responsibilities, there are suggestions such as not polluting the environment, not wasting water, using recycling bins, using public transportation, planting trees in nature, being conscious. This result is similar to the findings of the study conducted by Nacaroğlu and Bozdağ (2020), It has been determined that it has made suggestions such as giving importance to recycling in order to solve the environmental problems of special talented students and environmentally friendly and good people, increasing green areas, using of public transportation vehicles, the installation of filters in the factory chimneys. Considering the solution suggestions of students for environmental problems in this study, it is seen that they assume important responsibilities on individuals. Accordingly, it can be considered as an indicator that students tend to be sensitive and responsible individuals to environmental problems and to be conscious. On the other hand, the students emphasized that people who harm the environment should be warned or punished as legal responsibilities in their solutions to environmental problems. In the study conducted by Yalçınkaya (2013), some of the 8th grade students stated that they were of the opinion that heavy penalties should be imposed on those who pollute the environment and severe and deterrent penalties should be imposed on the laws. In the research conducted by Karagözoğlu (2020), when the suggestions for the solution of environmental problems were examined, it was determined that the participants suggested the implementation of penal sanctions, activities related to environmental education, and increased state control. Yazıcı and Utkugün (2019) stated in

their research that they examined the opinions of 7th grade students on environmental problems, and stated that legal regulations should be made to punish as a solution to environmental problems.

According to the results of the study, there are slogans produced by the students about environmental problems. It can be said that most of the slogans produced by the students are about keeping the environment clean and protecting. According to another finding of the study, environmental problems reflected in students' cartoons are mostly followed by garbage problem, air pollution, water pollution, forest destruction, drought, extinction, soil pollution, noise pollution, global warming, and unplanned urbanization. In summary, it can be said that the environmental problems reflected in the students' cartoons are mostly related to environmental pollution. There are studies with similar results in the literature. Pınar and Yakışan (2017) stated in their study with primary school students that students explained their environmental problems with their drawings regarding garbage and air pollution. In the study conducted by Yalçınkaya (2013), it was stated that students mostly reflect the garbage problem, air pollution, water pollution and deforestation in their cartoons. Özdemir Özden and Özden (2015) found that environmental problems reflected in students' drawings are air pollution, garbage waste, water pollution and damage to green areas in their study called examining student pictures related to environmental problems. It was found that some of the students depicted more than one environmental problem in their drawings. On the other hand, it is observed that students reflect the environmental problems at the local level more on their drawings, while it is seen that they reflect the problems such as global warming less on their drawings. In other words, it can be said that students concentrate on environmental problems that occur in their immediate surroundings. Similar results have been achieved in some studies in the literature (Özsoy, 2012; Özdemir Özden and Özden, 2015; Lake, Saymalı and Karaca, 2016).

Suggestions that can be made based on the results of the research are as follows:

• Unlike this study, students' perceptions of environmental problems can be examined at different levels of education using different research methods.

• Public attention can be drawn to the issue through programs such as advertising, public service ads, and news aimed at raising environmental awareness and sensitivity through mass media.

• It should be ensured that activities such as seminars, panels and conferences on environmental education are held at regular intervals in a way that covers all segments of the society.

• A course that can be taught at all levels starting from primary school can be created under the name of environmental education, in which applied activities will be predominant.

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