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ARTVIN CITIZENS' REASONING ABOUT A LOCAL ENVIRONMENTAL ISSUE: CERATTEPE

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ABSTRACT

Mining is a current problem in Artvin. Officials decided to extract copper and gold mine in Artvin. However, there are different opinions about this. A group of people objects the decision of officials. On the other hand, there exists a group of people supporting mining. Taking into account of stakeholders' position is valuable in creating democratic societies. Therefore, citizens should have the right to participate in decision-making process because they are affected directly from it. For the purpose of deciding on their position, local citizens' views about copper and gold mining in Cerattepe were investigated. For this purpose, 534 local citizens were interviewed. Their reasoning was coded as econcentric, anthropocentric, mix, or none of them. The data analysis showed that most of the local citizens showed mix reasoning (including ecocentrism and anthropocentrism) against mining in Cerattepe but they could not provide sound and scientific reasoning supported with evidence.

Keywords: Environmental dilemma, reasoning, socioscientific issues.

INTRODUCTION

Mining is a current problem in Artvin. A company is planning to extract copper and gold in Cerattepe which is a hill in Artvin. Artvin city center is set at the foot of Cerattepe. It has a rich flora as being covered with forests and on the route of bird migration. It is also noted as the water supply for the city. There were several attempts for mining in the past but it has never extracted. Nowadays, the company after getting a new license issued by the government restarted the mining project. Many shops and restaurants hung notes on their store fronts telling that if any real attempts occur in Cerattepe, that shop will be closed. Indeed some of them were closed during intervention in Cerattepe. In brief, a majority of Artvin citizens protested against mining in their hometown. However there is a group of people thinking that the copper and gold ore should be extracted. That is, this issue created groups among Artvin citizens thinking differently about mining in Cerattepe.

Such issues including mining called socioscientific issues. Socioscientific issues (SSI) are defined as "complex, open-ended, often contentious dilemmas, with no definitive answers. In response to socioscientific dilemmas, valid, yet opposing, arguments can be constructed from multiple perspectives" (Sadler, 2004, p. 514). Based on its definition, it is clear that SSI is complex, controversial, open to inquiry, and include various perspectives. People should think on these issues carefully by taking different perspectives into account. That is, they should be able to make sound reasoning. Citizens are the key stakeholders affected from the human intervention on the environment. Such decisions should be taken as a result of cooperation with different stakeholders who will be affected directly or indirectly.

Citizens' sound reasoning and being a part of decision making process are important in achieving a scientifically literate society. Those citizens once were students in classrooms. How they reason as citizens of a society is actually related to how they learned reasoning when they were students. The classroom activities that foster students' reasoning on issues related to science, society and environment have a significant role in preparing citizens of societies for a future world which is highly dynamic in science and technology. Moreover society is dynamic too and it is affected from the developments in science and technology.

Where and how can educators prepare citizens for such a world? Many scholars, experts and researchers believe that science education should prepare students to cope with the results of interaction between science, technology, and society. Millar and Osborne (1998) underlined that science education should prepare individuals for "a full and satisfying life in the world of the 21st century" (p.2012). Moreover they believe that for this purpose, they should be involved in learning opportunities in which they can present their ideas and defend them with evidence. It is important for them to share their ideas with their peers and discuss on different perspectives and, as a result, reach a common point. Science education should contribute to public life and common good (Hurd, 1998). For this purpose, educating scientifically literate individuals for the future is accepted as the main goal of science education in many countries (Aikenhead, 2002; Barrue & Albe, 2013). Scientific literacy, although there is not a consensus on the definition of scientific literacy (Roberts, 2007), refers to the science for citizenship which means educating scientifically literate citizens who are aware of science, technology and their impact on society. Therefore preparation for the citizenship should start from the early years in school. This means education at all levels has the responsibility to achieve this.

With this in mind, in the present study, we aimed to explore how Artvin citizens reason on a local societal and environmental dilemma which, as mentioned at the beginning, is copper and gold ore extraction in Cerattepe. We believe that their reasoning will provide valuable information about whether their formal education prepared them for citizenship. We investigated Artvin citizens' reasoning on Mining in Cerattepe in terms of ecocentrism and anthropocentrism. Kortenkamp and Moore (2001) stated;
Anthropocentrism considers humans to be the most important life form, and other forms of life to be important only to the extent that they affect humans or can be useful to humans. In an anthropocentric ethic, nature has moral consideration because degrading or preserving nature can in turn harm or benefit humans… In an ecocentric ethic nature has moral consideration because it has intrinsic value, value aside from its usefulness to humans (p. 262).

For example Kahn (1997) studied with children about the ecological dilemma which was the Exxon oil spill in Prince William Sound, Alaska in 1989. They interviewed with 60 children from second, fifth and eighth grades. Children's responses were coded as biocentric or anthropocentric. Both types were found among children's responses. Kortenkamp and Moore (2001) studied with adults. They coded participants' reasoning as ecocentric, anthropocentric, or nonenvironmental for different ecological moral dilemmas. They also investigated the influence of individual differences and situational variables. The results showed that pro-environmental attitudes were related to more ecocentric and anthropocentric and less nonenvironmental reasoning. The presence of information about the impact of ecological damage on the environment is related to more ecocentric reasoning, while the presence of a social commitment elicited more nonenvironmental moral reasoning.

METHODOLOGY

Participants

The participants were 534 people living in Artvin city center. Their hometown is Artvin. Their ages range between 23 and 67. There were shop and restaurants owner, housewife, pharmacist, security staff, retiree, student, nurse, teacher, and lawyer among them.

Instrument

A semi structured interview protocol was prepared by the researchers. A few sample questions in the protocol were given in Table 1. Based on responses further questions were asked to the participants.

Table 1: Sample Questions in Interview Protocol

Interview questions
What does Cerattepe mean to you?
What do you think about mining in Cerattepe?
Have you ever seen mining area and surrounding environment? If so, how does it affect your decision?
What are the consequences of mining in Cerattepe in terms of your opinions?

Procedure

People living in Artvin were asked if they were voluntary to participate in the study. They were informed about the goal of study at the beginning briefly. Then they responded to each question in the interview protocol. They were requested to clarify their ideas if there are unclear points.

Data analysis

Data analysis was based on whether their reasoning is ecocentric, anthropocentric, mixed or none of these categories. If their reasoning was focused on the impact of mining on human wellbeing, it was coded as anthropocentric. If they think in terms of impact of mining on nature, plant and animal species then such responses were coded as ecocentric. Other responses including political authority were coded as none. This process was performed by two independent researchers and disagreement between researchers was resolved through negotiation.

RESULTS

This study aimed to explore whether Artvin citizens' reasoning on mining in Cerattepe. Before that, the frequency distribution of citizens that are against and in favor of mining was provided in Table 2. Then the frequency distribution for four categories of reasoning, econcentric, anthropocentric, mixed or none, emerged from data analysis was provided in Table 3.

Table 2: Artvin Citizens' Decision on Mining in Cerattepe

What do Artvin citizens think about mining in Cerattepe?	Frequency
Against Mining	425
In Favor of Mining	109

Table 3: Frequency distribution for Artvin Citizens' Reasoning

Reasoning Type	Frequency
Ecocentric	98
Anthropocentric	124
Mixed	284
None	28

As seen from Table 2, most of the Artvin citizens do not favor mining in Cerattepe. When they were asked the reason behind their decision, they considered impact of mining on both human and nature in their reasoning. That is their reasoning was a mix of anthropocentrism and ecocentrism. For example one of the citizens stated; *I do not want mining in Cerattepe because the nature will disappear the human health will be affected in anyway.*

As it is clear from above statement, this citizen's reasoning was based on human and nature together. Therefore he was assigned to the category of mix reasoning. Another common response for mix reasoning is;
I think mine should not be extracted because water will be polluted and we are drinking that water. It will affect us directly. Moreover trees will be cut down and forests will disappear.

The citizen above showed also mix reasoning in terms of anthropocentrism and ecocentrism for mining in Cerattepe. In brief, the participants displaying mix reasoning had similar concerns about mining. They all think that human health will be affected negatively and nature will be destroyed.

On the other hand, there were some participants whose reasoning focused on either nature or human beings. To exemplify, the next statement belongs to a citizen whose concern for mining was only human health.
We do not want mine. Water will be polluted. Our health will be under dangerous. I live in Artvin for 58 years. I feel healthy here. But if mine is processed then my health will be affected badly.

Another citizen also considered the impact of mining on people living in Artvin when he was asked about mining in Cerattepe. He specifically stated;
As Artvin citizens, we are against mining. The company will gain a lot from this. But what we will gain? We will lose our health, drinking water, our land to make picnic.

There were also a group of people, although a small number, whose reasoning did not include any environmental or human-related concern. For example the following participant expressed that;
Mining in cerattepe is not a decision of me. It is a decision of authority which is government. Whatever people do for protest is not useful. The company will get necessary license. If the court reject it, then they will get another because the government also favors the company.

The citizen above did not make his decision based on ecocentrism or anthropocentrism. His reasoning was not also based on economy. He just believed that this is an issue of authority not people living in Artvin. Another example statement given below is also similar to the one above with a difference which was the reasoning based on economy.
That gold and copper should be extracted. We need it. Why are we keeping in under mountains? That is exactly what our economy needs. It should be certainly and quickly extracted.

The citizen above takes the economy as a center in his decision. Nothing else was evident in his reasoning. All of the above statements are examples taken from interviews. These are the common ones among participants. However, the most important result revealed from data analysis was that none of them could provide a sound reasoning based on evidence. They could only present their arguments with some explanations but could not support themselves with evidence and scientific explanations. They only talk about what they hear from others instead of searching for more information about the consequences of mining. The next statement is clearly exemplifies this.
Everybody says something about it. Based on what I hear, I am discussing it with my friends, family. Nobody as expert did tell us about how the mine will be extracted.

When participants were asked about whether they search or read about mining, the common answer was the one given above showing that they were not knowledgeable enough about the issue.

DISCUSSION

The present study aimed to explore how the local people living in Artvin city center make decision on the environmental dilemma which was mining in Cerattepe. Cerattepe is a hill. The city was set toward its foot. Therefore the local people are really concerned about their health and the surrounding environment. This was apparent in their decisions and reasoning. A majority of people acted against mining in Cerattepe because they think that their living area, drinking water, nature, forests, all will not be the same after mining. That is they considered both anthropocentric and ecocentric factors in their decisions. However some people did only considered one of them. They either think about the influence of mining on human or nature. The results also revealed, a small group of people made their decisions on other factors such as politics or economy.

Another result found in this study was that although the participants' reasoning fell into one of the four categories (ecocentric, anthropocentric, mixed or none), they were only able to present their ideas and claims

with some explanations rather than supporting their ideas with evidence and scientific explanations. This is mostly because of the fact that they only hear from others and do not search for more reliable information. As a result, they could make simple, non-scientific explanations. Obtaining public opinion and preferences become an essential component of decision-making process for environmental dilemmas (Janse & Konijnendijk, 2007). However, the ideas of public might be biased, based on others' ideas and assumptions (Renn, 2006). Based on this result, it can be inferred that Artvin citizens' formal education, once they were students, might not be satisfactory in terms of preparing them for future world in which they may be faced to make decisions on such dilemmas. As a part of science education, students should be involved in learning activities in which they can foster their reasoning on controversial issues.

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