

PROBLEM SOLUTION PAPER

Submission I

Submitted by: Seyit Kubilay Ulucay, Umut Ilkbahar, Berke Cecen, Dilay Hallioglu, Berkay Tan.

Section: C

Submitted to: Burak Şenel

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Research Question (3 pts.)

To what extent can deforestation in Northeastern Turkey be reduced?

Research Findings (13 pts.)

1. The most striking numbers/statistics to prove the significance of the problem: (2 pts.)

- The Altindere valley has 384 plant taxons that belong to 61 familia and 190 species of alpine and subalpine flora. Among those, there are 32 endemic (8.3 %) and 9 rare species. (2.3 %). Those special and endemic species are under risk due to deforestation. (Uzun Palabaş and Anşin [2006](#)) (Sen, G., et al. 2015, Pg. 3)
- As an overall change between 1984 and 2007, there was a net decrease of 2.30% in total forested areas. Productive forest areas decreased 12,506 ha (That is nearly size of 17,865 football field), on the other hand, degraded forest areas increased 14,805 ha.(and that is nearly size of 21,150 football field) (Günlü A. et al. 2009, Pg. 127)
- Overall change between 1984 and 2007, the percentage of forest cover in the Rize decreased from 50.92% in 1984 to 48.62% (Günlü A. et al. 2009, Pg. 131)

Source(s):

- Sen, G., Bayramoglu, M. M., & Toksoy, D. (2015, July 24). Spatiotemporal changes of land use patterns in high mountain areas of Northeast Turkey: A case study in Maçka. Retrieved from <https://link.springer.com/article/10.1007/s10661-015-4727-8>

- Günlü, A., Kadioğulları, A. I., Keleş, S., & Başkent, E. (2009, February 1). Spatiotemporal changes of landscape pattern in response to deforestation in Northeastern Turkey: a case study in Rize. Retrieved from <https://link.springer.com/content/pdf/10.1007/s10661-007-0144-y.pdf>

2. The underlying causes of the problem: (2 pts.)

- **Economic:**

- **Excessive mining:** Turkey's Ministry of Energy and Natural Resources has granted a total of 1012 mining licenses to 303 companies in six provinces in the Eastern Black Sea Region. The rapidly increasing mining activities are generally carried out by open pit operation. For this, first the trees are cut and the forest cover is shaved. Then the soil on the mine is removed and stored in another place. (Atmiş E. 2016, Pg. 4)
- **Construction of Infrastructure:** Gümüş and Eryılmaz (2015) state that only the observance of economic planning on the roads built to reach the touristic facilities in Altındere Valley National Park (Trabzon) causes great damage to the protected areas that contain natural and cultural values. They also state that the construction of the road, which was started by cutting down valuable spruce forests, was left unfinished, causing harm to the public.
- **Tourism:**
 - Turkey is facing increasing pressure on its natural resources from uncontrolled tourism growth aimed at achieving short-term economic benefits. (Kuvan, Y. 2011, July 26, Pg. 159)
 - A total of 3936.90 hectares forest land was allocated for tourism development by the MF and MCT by 2001 (MCT 2000; MF 2001) (Kuvan, Y. 2011, July 26, Pg. 161)

- **Social:**

- **Urbanisation has increased:** because of population increase as a result of immigrants from rural areas to urban areas. Increased population and urbanisation have caused irregular land use/land cover changes (Günlü A. et al. 2008, Pg. 134). Within that population growth demand to the production of wooden products has increased with directly proportional.
- **Lack of Education:** People are solely responsible for forest degradation because of their unsustainable exploitation through excessive harvesting of forest products, overgrazing, wildfires, and the spread of invasive species or pests. (Bodo, T., et al., 2021, Pg. 23)
- A serious majority of wildfires are due to irresponsible acts such as negligence and human errors. (VATAN Newspaper, 2021)

- **Politic:**

- **Constitutional And Legal Arrangements:** It is possible to narrow down "forest", even areas that can be scientifically considered "forest". As a matter of fact, many constitutional and legal regulations have been made to allow for narrowing with various tools. (Karabıyık, E., 1993, Pg. 80)
- **Reluctancy of government:** Within the scope of the Green Road Project, the General Directorate of Forestry of Turkey granted a tree cutting permit on an area of 16 decares. (16 decares is more than twice as much as a football field) (Birgün Newspaper, 2015)

Source(s):

- Günlü, A., Kadioğulları, A. I., Keleş, S., & Başkent, E. Z. (2008, February 1). *Spatiotemporal changes of landscape pattern in response to deforestation in Northeastern Turkey: a case study in Rize*. Retrieved from: <https://link.springer.com/content/pdf/10.1007/s10661-007-0144-y.pdf>
- '89 percent of fires in Turkey are caused by humans!'. (2021). VATAN Newspaper. Retrieved from: <https://www.gazetevatan.com/gundem/turkiye-deki-yanginlarin-yuzde-89-u-insan-kaynakli-1405417>
- *During the Green Mile debate, they cut down thousands of trees*. (2015). Birgün [Rize]. Retrieved from: <https://www.birgun.net/haber/yesil-yol-tartismasi-surerken-binlerce-agaci-kesmisler-84788>
- Kuvan, Y. (2011, July 26). *Mass Tourism Development and Deforestation in Turkey*. Retrieved from: <https://www.tandfonline.com/doi/pdf/10.1080/13032917.2010.9687096?needAccess=true>
- Atmış, E., & Günşen, H. B. (2016). *Türkiye’de orman yıkımına karşı mücadelelerin analizi*. In Third Annual International Conference on Turkey and Turkish Studies, Athens, Greece. Retrieved from: https://www.researchgate.net/profile/Erdogan-Atmis/publication/307545673_Turkiye'de_Orman_Yikimina_Karsi_Mucadelelerin_Analizi/links/57c7e80f08ae28c01d4f9963/Tuerkiyede-Orman-Yikimina-Karsi-Muecadelelerin-Analizi.pdf
- Bodo, T., Gimah, B. G., & Seomoni, K. J (2021), *Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions*.
- Karabıyık, E. (1993). *THE EFFECTS OF ENVIRONMENTAL PROBLEMS ON DEFORESTATION*. Retrieved from <http://nek.istanbul.edu.tr:4444/ekos/TEZ/21700.pdf>

3. The major consequences of the problem: (2 pts.)

- **Socio-economic:**

- People get forced to leave their ancestral homes and move elsewhere due to deforestation and its consequences. (*Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions*, Bodo et al., 2021, Pg. 28)

- **Environmental:**

- Lands that have been deforested experience more flooding and landslides. (*Detection of disaster-prone vernacular heritage sites at district scale: The case of Fındıklı in Rize, Turkey*, Aktürk & Hauser, 2021) (pg. 10)
- Deforestation leads to habitat loss while preservation and conservation of the natural forest increase biological diversity. (*Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions*, Bodo et al., 2021, Pg. 22)
- Deforestation exposes the soil making it increasingly fragile, leaving it more vulnerable to natural disasters such as landslides and floods. (*Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions*, Bodo et al., 2021, Pg. 27)
- 1,280,820.83 tons of landslides in the Eastern Black Sea region every year.
- Deforestation is estimated to be responsible for 10-15% of all anthropogenic CO2 emissions. (*Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions*, Bodo et al., 2021, Pg. 27)

Source(s):

- Bodo, T., Gimah, B. G., & Seomoni, K. J. (2021). Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions. Retrieved from <https://eds.s.ebscohost.com/eds/pdfviewer/pdfviewer?vid=1&sid=8394f4c3-875f-4342-a7ce-709b1e0e2342%40redis>
- Aktürk, G., & Hauser, S. J. (2021). Detection of disaster-prone vernacular heritage sites at district scale: The case of Fındıklı in Rize, Turkey. Retrieved from <https://reader.elsevier.com/reader/sd/pii/S2212420921002041?token=8F89280E0A5F717FE72FB6CADD2168231790A02C3630C4D804E69C6B32AD1EEA9FC0C3219CA8C69A15996B1B83A3A05A&originRegion=eu-west-1&originCreation=20220318145633>
- Turkish Ministry of Agriculture and Forestry (2018). *DEMIS Turkey Water Erosion Statistics, Technical Summary*. Retrieved from: [https://www.tarimorman.gov.tr/CEM/Belgeler/yay%C4%B1nlar/yay%C4%B1nlar%202018/Di%20namik%20Erozyon%20Modeli%20ve%20C4%B0zleme%20Sistemi%20\(DEM%C4%B0S\)-%20Teknik%20C3%96zet.pdf](https://www.tarimorman.gov.tr/CEM/Belgeler/yay%C4%B1nlar/yay%C4%B1nlar%202018/Di%20namik%20Erozyon%20Modeli%20ve%20C4%B0zleme%20Sistemi%20(DEM%C4%B0S)-%20Teknik%20C3%96zet.pdf)

4. Existing solutions (6 pts.)

- *Solution 1:*

Name of the project: Rebellion in Artvin, Cerattepe

Name of the solution player: Citizens of Artvin

Type of the solution player: Citizens

Aim/mission of the project: For the last 20 years, Artvin is suffering from mining projects. Government allows companies to do their mining projects and to provide them a comfort spot, the government separates 4406 hectare area for these projects (nearly 1 million 700 thousand trees are in danger). However, the citizens of Artvin do not allow the government to do this and start to resist.

Activities of the project: They start to resist and become successful. they have a chance to meet with the government. Because of the pressure that the citizens create, projects and separated places are released.

Source(s): Atmış, E., & Günşen, H. B. (2016, Pg.5). Analysis of Struggles Against Deforestation in Turkey. Retrieved from

[https://www.researchgate.net/profile/Erdogan-](https://www.researchgate.net/profile/Erdogan-Atmis/publication/307545673_Turkiye'de_Orman_Yikimina_Karsi_Mucadelelerin_Analizi/links/57c7e80f08ae28c01d4f9963/Tuerkiyede-Orman-Yikimina-Karsi-Muecadelelerin-Analizi.pdf)

[Atmis/publication/307545673_Turkiye'de_Orman_Yikimina_Karsi_Mucadelelerin_Analizi/links/57c7e80f08ae28c01d4f9963/Tuerkiyede-Orman-Yikimina-Karsi-Muecadelelerin-Analizi.pdf](https://www.researchgate.net/profile/Erdogan-Atmis/publication/307545673_Turkiye'de_Orman_Yikimina_Karsi_Mucadelelerin_Analizi/links/57c7e80f08ae28c01d4f9963/Tuerkiyede-Orman-Yikimina-Karsi-Muecadelelerin-Analizi.pdf)

○ Solution 2:

Name of the project: Ecotourism

Name of the solution player: Governor of Artvin

Type of the solution player: Government

Aim/mission of the project: Nowadays, people prefer to travel small and natural places to escape from the stress of the bigger places. One example from these places is Camili Biosphere

Reserve in Artvin. In Artvin, people gain their lives from forests. However, the popularity of small places for travel affects citizens of Artvin. Their sources (forests) are damaged because of these tourism activities. Therefore, this project aims to make everyone happy by helping forest villagers and creating decent travel places for tourists at the same time by the help of ecotourism.

Activities of the project: With the help of the questionnaires applied with the villagers selected according to the full count method; all ages from the group; The educational status of the villagers participating in the event, their level of knowledge about ecotourism activities, their annual income, change in living conditions and migration from village to city; is measured before and after ecotourism Data will be analysed through descriptives, Chi-Square, paired T tests and Wilcoxon analyses. As a result, it is revealed that the studies carried out in the region related to ecotourism are not sufficient and the studies in this field should be increased.

Source(s): Aydın, I. Z., & Türker, M. F. (2010, November 8). Socio-Economic Effects on The Forest Villagers of Ecotourism Potentia. Retrieved from <https://ofd.artvin.edu.tr/en/download/article-file/25704>

○ Solution 3:

Name of the project: Ecosystem-based multiple-use forest planning (EBMUFM)

Name of the solution player: Turkish government

Type of the solution player: Government

Aim/mission of the project: Developing Turkish forest management with “sustainable forest management” criteria and indicators drafted in a few national and international agreements.

Activities of the project: Research is done at Saçinka Forest which is located in Northeastern Turkey. To assess the patterns during a 21-year period (1985-2006), the necessary data were obtained from forest stand maps and evaluated with Geographical Information Systems (GIS). Results showed that the decrease of agricultural and settlement areas caused the increase of productive forests and the decrease of degraded forests. Bark beetles, which have a common effect in Artvin, had less effect on the vitality of Saçinka Forest Planning Unit forests compared to the neighbouring forest ecosystems. This forest ecosystem vitality and integrity level was a result of the mechanical and biological interventions against the beetle damages and appropriate silvicultural prescriptions.

Source(s): Yolaşmaz, H. A., & Keleş, S. (2009, April 30). Effects of Turkish forest management philosophy and applications on forest ecosystem structure and functions in Northeast Turkey: A case study in Saçinka Forest Management Planning Unit. Retrieved from <https://academicjournals.org/journal/AJAR/article-abstract/C69895828560>

PROBLEM SOLUTION PAPER

Submission II

Submitted by: Seyit Kubilay Ulucay, Umut Ilkbahar, Berke Cecen, Dilay Hallioglu, Berkay Tan

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To what extent can deforestation in Northeastern Turkey be reduced?

Seyit Kubilay Ulucay, Umut Ilkbahar, Berke Cecen, Dilay Hallioglu, Berkay Tan

I. Problem Statement

Deforestation has been defined by FAO (Food and Agriculture Organisation of the United Nations, 2007) as *“the conversion of forest to another land use or the long-term reduction of tree canopy cover below the 10% threshold.”*. The world has been experiencing deforestation on large scales for decades and the consequences of deforestation can be seen in South-eastern Turkey. To be more precise 12,506 ha., which is equivalent to 17,865 football fields of productive forest area was destroyed and degraded forest areas increased by 14,805 ha., which is nearly the size of 21,150 football fields (Günlü A. et al. 2009, Pg. 127). This pattern of deforestation resulted in Rize losing 2.30% of forested areas between 1984 and 2007 (Günlü A. et al. 2009, Pg. 131). Deforestation this large affects the life within the forests as the trees and the area around it is the habitat for many living things. For instance, Altındere Valley, which is South-eastern Turkey, is a very heavily forested area and is home to 32 endemic and 9 rare species according to Sen et al. (2015, Pg. 3) which are under threat as the habitats of these species are being destroyed due to deforestation. These endemic and rare species must have special protection, but they are threatened by mass destruction of forested areas which causes habitat loss and disruption of the balance within the ecosystem. If this pattern remains continuous humanity will face dramatic consequences unless some drastic changes in how forested areas are treated are made.

There are three main reasons which cause deforestation, and they are economic, social, and political. To begin with, there are some concerns about financial gains being prioritised over preservation of nature. One of the concerns is about excessive mining which is a very important one, as mining fields need large areas. Atmis (2016, Pg. 4) states that, Turkey's Ministry of Energy and Natural Resources has granted 303 companies 1012 mining licences in the Black Sea region and the procedure of mining starts with complete destruction of forest areas. Because of these permissions, deforestation is continued indirectly by the government and that shows the relation between

deforestation and politics. One of the economic causes is also related with social causes, which is the construction of infrastructure, which harms nature especially if constructions are within the borders of a natural park. As Gümüş and Eryılmaz (2015) mentions, construction of the roads built to reach the touristic facilities in the Altındere Valley National Park, damages nature greatly as much valuable spruce forests were cut down to start building the road. Tourism is also one of the economic causes of deforestation because Turkey is damaging its natural resources to achieve short-term goals with uncontrolled tourism according to Kuvan (2011). Another major reason for deforestation is related with social problem which is urbanisation on a large scale. Günlü A. (2009) shares the same concern because of the number of people who migrate from rural areas, urbanisation has increased and the demand for wooden products has risen by population. Unless the expansion towards forests is controlled the consequences may be irreversible as the habitat destruction will lead to loss of biodiversity. Yet, the government of Turkey does not seem to handle the situation too seriously as they allow forests to be cut down to build more roads, as we can also see for the Green Road Project which held in Northeastern Turkey, Rize, more than twice as much as a football field of precious forest area was cut down even though this project was meant to be 'green' (Birgün Newspaper, 2015). Also the term 'forest' can be legally narrowed even if the area is scientifically called a forest and this makes it easier for the government to give permits to destroy these valuable lands (Karabıyık, E., 1993, Pg. 80). The way of looking at forests as they are the place to build roads and facilities need to change before it is too late.

Aside from the causes of deforestation, the main consequences divide into two areas which are environmental and socio-economic. One of the environmental consequences is increasing CO₂ emissions. Due to deforestation the trees that act as natural shields are cut down. This causes the absorbed CO₂ from the trees to be released again into the atmosphere and this also prevents trees from releasing oxygen into the atmosphere which is vital for human survival. These causes are

responsible for almost 15% percent of CO₂ emissions caused by humans (Bodo et al., 2021, pg. 27). By losing trees humanity will be faced with CO₂ accumulation which is really harmful for humanity. Another major environmental problem of deforestation is landslides. Lands that have been deforested experience more flooding and landslides (Aktürk & Hauser, 2021) because the roots of the trees hold onto the soil and prevent the soil from misplacemening. Because there are no roots to hold onto soil due to deforestation, every year 1,280,820.83 tons of landslides happen in the Black Sea region according to the Turkish Ministry of Agriculture and Forestry (Turkish Ministry of Agriculture and Forestry, 2018). With lots of landslides happening people lose their homes and, they can not find place to live as Bodo et al. (2021, pg 28) mentions and also they lose their workplaces where they can make money, and farms where they make food to stay alive and this situation puts people in financial and moral difficulties. Putting an end to deforestation and encouraging people to plant trees is crucial to saving the soil that takes thousands of years to form. The loss of habitat is another problem caused by deforestation. Since deforestation is responsible for mass destruction of forests, the large range of biological diversity that live in it is endangered due to deforestation (Bodo et al., 2021, pg. 22). The way of treating forests needs to change in order to leave a better and sustainable future for the next generations to give them a chance to develop continuously without compromising future generations' ability to satisfy their own needs. If not, it will be dramatic and maybe lead the community to horrific and irreversible changes in the future.

II. Existing Solutions

In this paper, a variety of existing solutions for preventing deforestation are explained and analysed in a chart (see appendix). The first solution which is examined in this paper, was by the citizens of Artvin. As a citizens' solution, protesting is the best way to be heard. The citizens of Artvin have been suffering from deforestation caused by the mining projects for 20 years. As being aware of the importance of forests, they started to rebel against the government to stop the mining projects.

The rebellion of the citizens is considered by the government and the citizens had a chance to meet with the government. The result of this meeting is the cancellation of the mining projects and the release of the surrounding areas. The success of the meeting saves approximately 1.7 million trees from dying. That solution is addressed to two SDGs, the first one is SDG 13 Climate action, the other is the SDG15 is Life on land by saving trees by protesting the government and as a result of success, environmental sustainability is provided. Also, that protest makes the area safer than before for future projects and will make the future project less risky. However, there is still a risk of new projects in this area because these protests can provide only a temporary solution. There is no guarantee that these places are safe forever.

As a government solution, ecotourism is a very efficient way to provide everyone's benefit. It is aimed to contribute to the sustainability of forest resources and rural development studies according to the socio-economic characteristics of the forest villagers in the Artvin- Camili Biosphere Reserve area, where forest-village relations are intense. When it comes to investing in ecotourism, it can be said that it is necessary to invest in the forest villagers, who protect and look after the forest in the region that carries out this activity. Necessary incentives, technical and financial support should be provided for the development of interpersonal relations, especially in ecotourism activities. Otherwise, it can be said that the individual will not have any importance in ecotourism activities that develop day by day. There are some strengths and weaknesses that exist in this project. Because of being organised by the government, there is a lot of facility to make this project carry out. There are no economic barriers. Applicable. It aims to benefit everyone (not one sided project, it has equal distance from two perspectives). On the other hand, questionnaires are done on forest villagers, their ideas are taken and reported. However there are no physical and permanent solutions to solve the problem. There are only spiritual and temporary solutions to save the day.

The third existing solution in this paper is about a research which was carried out in Northeastern Turkey in Saçınka Forest, done by the Turkish Government, acquired data and analysed patterns over a 21-year period showed that as agricultural and settlement areas shrank, so did the amount of degraded forest, when the amount of productive forest increased. Bark beetles, the insect species which are famous for their destructive skills on mature trees and also widespread in Artvin, had far less impact on the vitality of the Saçınka Forest Planning Unit forests than that of the surrounding forest communities as a result of the mechanical and biological treatments against beetle damage, as well as proper silvicultural prescriptions. This project was carried out by obtaining the necessary data from the Geographical Information Systems (GIS) without any economic cutbacks and required extensive work and research by the Turkish Government which makes this research well organised and systematic. Aside from these factors there is still no definite solution found for the problem and since it takes a very long time to get results back from this expensive research, it is risky for anyone to invest in it so not a lot of people choose to contribute and invest in this research.

All the solutions mentioned above will definitely help our world and country to have a livable and sustainable life without compromising future generations' ability to satisfy their own needs by contributing to the sustainable development in Turkey. Although these projects may help alleviate the forest problem, other efficient solutions still need to be developed because as mentioned earlier, all of the existing solutions had many problems with them including not having direct and long-term solutions. In the next section of the paper, our solutions will work on eliminating those weak points and developing a long-term solution to achieve SDGs 13 and 15 by closely investigating the positives and the negatives of the existing solutions. We propose our solution below with the hope that we contribute to the sustainability of our planet.

III. Appendix

School of Languages (ScOLa)
Undergraduate English Programme

Solution Player/Method	Name/Title	Brief info. about the organization	Which SDG(s) addressed	Project Description	Strengths	Weaknesses
1.Citizens	Rebellion in Artvin,Cerattepe	Organisation is created by citizens of Artvin. Their main goal is protecting nature. Basics of this organisation stand on unity and coherence of the citizens of Artvin	Sdg number 13) Climate action Sdg number 15) Life on land	In Artvin, the government let some mining companies do their business. However the citizens do not allow these companies to do their business because the citizens know that these companies would cause a lot of environmental damage while they are working. To change	This project is against creating places by cutting trees to create spaces for mining. Therefore the aim of this project is saving trees from being cut down. It directly solves the problem because It saves approximately 1.7 million trees from being cut down. It provides	This project provides only a temporary solution. There is no guarantee that these places are safe forever.

				<p>this situation, the project was born. This project is against destruction of trees to create mining spaces.</p>	<p>environmental sustainability. It decreases the chance of planning new projects on these lands because locals make their voice heard and show their reaction about the situation.</p>	
Reference(s)	<p>Atmış, E., & Günşen, H. B. (2016, June 27). <i>"Türkiye'de Orman Yıkımına Karşı Mücadelelerin Analizi"</i>. ResearchGate. https://www.researchgate.net/profile/Erdogan-Atmis/publication/307545673_Turkiye'de_Orman_Yikimina_Karsi_Mucadelelerin_Analizi/links/57c7e80f08ae28c01d4f9963/Tuerkiyede-Orman-Yikimina-Karsi-Muecadelelerin-Analizi.pdf</p>					

School of Languages (ScOLa)
Undergraduate English Programme

2.Government (GO)	Ecotourism	Governor of Artvin. One of the 81 governor of the Republic of Turkey	Sdg number 13) Climate action Sdg number 15) Life on land	After the increase in popularity of small places to travel, one of these small places, Camili biosphere reserve, suffers from this crowd. Its capacity cannot carry this crowd. Therefore, some deforestation and natural destruction happens to open spaces. However, these natural sources and forests, which are destroyed, are the main source of life	This project is organised by the government. Therefore, there is a lot of facility to make this project carry out. There are no economic barriers. Applicable. It aims to benefit everyone (not one sided project, it has equal distance from two perspectives).	Questionnaires are done on forest villagers, their ideas are taken and reported. However there are no physical and permanent solutions to solve the problem. There are only spiritual and temporary solutions to save the day.
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				and money for the forest villagers. Therefore, a solution which everyone can get maximum benefit, should be developed.		
Reference(s)	<p>Aydın, İ. Z., & Türker, M. F. (2010, November 8). "Artvin- Borçka Camili Biyosfer Rezerv Alanındaki Ekoturizm Potansiyelinin Orman Köylüleri Üzerindeki sosyo-ekonomik Etkilerinin İrdelenmesi". Artvin Çoruh Üniversitesi Orman Fakültesi Dergisi » Ana Sayfa.</p> <p>https://ofd.artvin.edu.tr/en/download/article-file/25704</p>					
3. Government (GO)	Ecosystem-based multiple-use forest planning (EBMUFM)	The Turkish government is responsible for this project.	Sdg number 15) Life on land	Compared with the nearing ecosystems, Saçinka Forest (located in Northeaster	Necessary datas to make this project carry out, are obtained from Geographical	There is very extensive work and research. However there is no direct

				<p>n Turkey) is losing its vitality and integrity. For example, Extinction of bark beetles whose home habitat is Saçinka Forest. After this and similar examples, the Turkish government decided to change its policy about forests and this project is a very huge step for this policy.</p>	<p>Information Systems (GIS) which is controlled by the government. It means this project is carried out in efficient conditions. Also, there are no economic barriers to carry out this project because it is carried out by the government. It is well organised because references for this project are taken from existing national and</p>	<p>solution to solve the problem. It is expensive and investing for this project is a risk because it is a long-term project, giving its fruit after a very long time.</p>
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					international agreements.	
Reference(s)	Yolasiğmaz, H. A., & Keleş, S. (2009, March 2). <i>Effects of Turkish forest management philosophy and applications on forest ecosystem structure and functions in Northeast Turkey: A case study in Saçinka Forest Management Planning Unit</i> . Academic Journals. https://academicjournals.org/journal/AJAR/article-abstract/C69895828560					

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Submission 3

BERKE

We construct a forest which is used to produce wooden furniture. As a starting point, we will purchase 60 hectare of forest. We plant trees with 3 x 1 meter gaps to maintain the ecosystem without any change. For 1 hectare, we plant approximately 3.300 trees and it makes a total of approximately 120.000 trees as a starting point. If we need more funds, we have land where we produce hazelnut. As an extra income (instead of income from furniture), we can sell hazelnuts to make up for our shortcomings.

To decide type of tree to plant, we need to observe which trees have ability to live in blacksea ecosystem and suitable for producing wooden furniture. According to our research, oak (*Quercus robur* L., *Quercus petraea* L.) and hornbeam (*carpinus betulus*) are the most appropriate types of tree for our project. We plant a mixture of these two trees on our land. Or we can use maritime pines (*pinus pinaster*) for industrial forest, instead of giving flowers like hornbeams maritime is giving pine cones which is also profitable.

When choosing our place to do the project, we decide to use land which has a high potential to become a forest. Therefore, we go on destroyed forests. On 8 December 2021 a wildfire happened in Rize, Fındıklı, Çağlayan village. After the wildfire, most of the forests were damaged. Because of being a forest before the wildfire, we decided to do our project there.

Firstly, we purchased 60 hectares of land from this village. From the datas of Enat AŞ which is a pioneer of the idea of industrial forests, creating an industrial forest from zero needs 15 years to give its outcome. After 15 years, the forest is ready to be cut. In 5 years the forest will be cut completely. At the end of 5th year, new planting starts immediately. The wastes from the cutting process are

converted into munchs and these munchs are added to soil to make soil more efficient. After repeating this process 3 times, the project ends.

Kubi

Deforestation is a global phenomenon with specific local and global causes and impacts. People's negligence about deforestation makes the issue bigger and worse day by day. In our solution, the focus is Northeastern Turkey, citizens of Turkey, social businesses and the government (basically everyone) have to move together to reduce deforestation as soon as possible, so that deforestation will not result in irreversible and horrible consequences. We developed the following project with the aim of contributing to a sustainable future and stimulating further improvements and applications to a variety of contexts.

Extra giriş:

As the K.O.A.Ş (Black-sea Forestation corporation) social business, the underlying causes, consequences as well as the existing solutions have been carefully examined which allowed us to write our own unique solution to the issue of deforestation in Northeastern Turkey. Citizens of Turkey, social businesses and the government basically everyone have to move together to reduce deforestation as soon as possible, so that deforestation will not result in irreversible and horrible consequences.

III. Suggested solution

As the K.O.A.Ş (Black-sea Forestation corporation) social business, the underlying causes, consequences as well as the existing solutions have been carefully examined which allowed us to write our own unique solution to the issue of deforestation in Northeastern Turkey. Citizens of Turkey, social businesses and the government basically everyone have to move together to reduce deforestation as soon as possible, so that deforestation will not result in irreversible and horrible consequences.

From our name K.O.A.Ş, it is easy to understand that we are focused on the northern blacksea region in Turkey. The aim of the “establishment and development project of industrial forest plantations in the Eastern Black Sea Region” is briefly, better protection of our natural forests by reducing the production pressure on them, reducing dependency on foreign markets by meeting the increasing need for raw materials, reducing the current account deficit by using the country’s resources, reducing carbon emissions and erosion, creation of new employment areas and finally it can be summarised as contributing to rural development. Our mission is to plant and create an industrial forest consisting of a mixture of oak and hornbeam trees to a flat area of 60 hectares as a starting point in the Rize province, which can contain about up to 120.000 trees. We will be providing material that is in high demand from the paper and packaging industry starting in 2022. From the date of the plantation, about 15-17 years later, harvesting and reforestation will take place with industrial automation tools, replanting all the trees that were harvested, and continuing the cycle.

Project 1 Raising public awareness

This stage will proceed with the government building a common understanding of the deforestation problem to create shared values on how forests which are currently not really understood how important deforestation is should be used and managed. Media tools such as TV, internet, and printed media, as well as non-conventional media tools such as billboards and product bills with pictures or messages on it will be used for raising public awareness. In Trabzon (most populated city in the Northeastern Blacksea) According to the Trabzon municipality, in 2017, 13 million commuters used public transportation only in Trabzon (Beyaz-Newspaper, 2018). That number will be larger if we think of Northeastern Turkey. As a result, transportation screens are probably a very effective way to communicate the project to society. Additionally, planning and executing campaigns by establishing partnerships with experts, schools, and local NGOs may provide effective dissemination of information. All of these attempts will definitely promote greater sustainable behaviour among city dwellers.

Project 2 Industrial Forest Project (planting , cutting, and selling trees as resource)

Our aim is decreasing deforestation. Production of wooden furniture is one of the most important reasons for deforestation. Therefore, we construct an industrial forest which is used to produce wooden furniture. Our hope while doing this project is to reduce the deforestation caused by the production of wooden furniture. For preparation, We purchase 60 hectares of land from Rize, Fındıklı, Çağlayan village. We decided to do our project there because this area was a forest before a huge wildfire happened. Being a forest before makes this place have a high potential to become a forest again. After choosing the land, we calculate the most efficient way to use the land. By the results of our research we decide to plant trees with 3 x 1 meter gaps. For a hectare, approximately 3.300 trees are planted and that makes a total of approximately 120.000 trees as a starting point.

Therefore, we purchase approximately 120.000 plants. While deciding the type of plants, we searched which type of tree grows faster, suitable for producing wooden furniture and able to live in blacksea ecosystem. According to our research, oak (*Quercus robur* L., *Quercus petraea* L.) and hornbeam (*carpinus betulus*) are the most appropriate type of trees for our project. Therefore, we plant a mixture of these two trees on our land. For planting trees, we want to get help from the citizens of Rize, Fındıklı. We give them money for per planting and cutting process. Our reason for using locals in Rize is, we want to show them that we are not damaging any natural resources. Also, we want to provide them a new source of income because we are aware of the economic difficulties that the locals are suffering from.

While implementing our project, we plant trees which we have purchased earlier, with 3 x 1 meter gaps to maintain the ecosystem without any change. As we said before in the preparation part, for 1 hectare, we plant approximately 3.300 trees and it makes a total of approximately 120.000 trees as a starting point. From the data provided by Enat AŞ which is a pioneer of the idea of industrial forests in Turkey, creating an industrial forest from zero needs 15 years to see the end result. The trees will be cut within 5 year intervals. At the end of 5th year, new planting starts immediately. The wastes from the cutting process are converted into munchs and these munchs are added to soil to make soil more efficient. After repeating this process 3 times, the project ends. If more funds are needed, the land which was bought from the locals can be used to grow hazelnuts as an extra income (instead of income from furniture) to make up for our shortcomings.

As an evaluation, we obtain wood after the cutting process. We sell these woods both as raw materials and sell them after converting into furniture. We decide to sell them as a raw material because we are aware of the lack of raw woods in the market. After the sales, we use the money to expand our industrial forest, do some encouragement payment to workers and for our training which we have stated at project 1.

On the contrary to the existing solutions discussed in the previous section lacking both a comprehensive scope and realistic approach. Other projects were only looking to save the day without thinking about the future of the country and citizens. The K.O.A.Ş Project is realistic, and long-term with a focused but still comprehensive scope. notably targeting Eastern Blacksea and its 2.5 million dwellers (TÜİK, 2021). In relation to the root causes mentioned earlier in this paper, the project directly addresses the underlying causes of the problem “lack of education” by giving forest education by qualified teachers to citizens, other causes which are political and economical are not easy to approach or tackle. Moreover, the K.O.A.Ş project is measurable and time-bound in the sense that the goal can be evaluated with objective statistics within a specific time span. By going through with this project; we will be contributing to the sustainable development of Turkey in the light of addressing the current needs of our generation without compromising future generations' ability to fulfil their own needs by dealing with SDG 13 (climate action) and 15 (life on land). The ultimate goal of preventing deforestation and contributing to sustainable development is realistically achievable when resources, enthusiasm, and support are available. This local project could also be an inspiring one both nationally and internationally.

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