

Positive and Negative Influence of Invasive Alien Species

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Abstract: Everything in this world is interconnected, and one touch of a thread can have a minor or significant impact on other parts of the whole system. One small change or intervention in a system can destroy an entire system that has functioned well and flourished. In our environment, these changes happen all the time, intentionally or unintentionally. For example, an increase in temperature by only one present in recent decades has created so many problems that a further increase in temperature is fraught with a complete change in the world we know. Similarly, there are others that are less harmful to the entire system, but dangerous to the smaller ecosystem of our world. These are invasive alien species. These species are described as being introduced into the ecosystem either by accident or by design, which does not occur naturally in the region of distribution. Therefore, the article will be devoted to these species. Mainly explaining the meaning and definition of invasive alien species. They affect nature both positively and negatively. Global warming and overpopulation and their role in the systemic whole will also be briefly explained. At the end, possible solutions will be outlined to overcome the damage they cause to natural habitats.

1 INTRODUCTION

The beauty of our planet can be mesmerizing, and it all comes from the diversity of our nature. Every place is different and has its own uniqueness and ecosystem. Therefore, taking care of the ecosystem to preserve its individuality also serves for the existence of local species of living organisms. Due to natural or deliberate interference with these ecosystems, severe consequences can occur. From violation of the natural habitat to its complete death. It is also fair to note that impacts are not only local, but may also affect the health of the global ecosystem.

Habitat destruction can occur gradually or over a short period of time. Biodiversity can be influenced by various factors. The following are some common examples: fossil fuel extraction, deforestation, river dredging, bottom trawling, urbanization, wetland filling, and field mowing (<https://www.everythingconnects.org/>). The destruction or alteration of biodiversity is not a new phenomenon. Numerous events have occurred in the past that have destroyed or altered unique ecosystems, and hence this has been the main reason for the emergence of a new form of diversity. However, in

today's realities, the loss of a significant part of biodiversity is inevitable. Global warming and population growth are the present and future reasons for the decline in diversity.

1.1 Global Warming

Global warming can be an example of gradually changing the established biological system. It does not need to be always in a negative way. Some might prosper from it and others not (Magomedov, 2021).

Global warming is a long-term increase in the average air temperature on Earth due to human activities, primarily the burning of fossil fuels, which increases the level of heat-trapping greenhouse gases (this process is called the "greenhouse effect") in the Earth's atmosphere. According to some estimates, the average temperature has increased by about 1 degree since the pre-industrial period, and it continues to rise (about 0.2 degrees per decade).

The "greenhouse effect" is the natural warming that occurs when certain gases in the Earth's atmosphere trap heat. These gases allow light to pass through but prevent heat from escaping, much like the glass walls of a greenhouse, hence the name. Sunlight hits the Earth's surface, where energy is absorbed and

then radiated back into the atmosphere as heat. There, greenhouse gas molecules absorb some of the heat, and the rest goes into space. The more gases accumulate in the atmosphere, the more heat is retained in the molecules.

1.2 Overpopulation

Future once must have seen bright, but with the today's realities it is not. The first and most obvious problem that leads to it is population growth and its consequences. The problems behind the population increase is that it creates higher numbers of demands for the resources and spaces. Where both of these are at their red line level. And the issue gets worse with the presence of climate change or in other words Global warming.

As it was mentioned, population increase is directly related with the resource demand. For instance, food and goods. Can we keep up with the demands of growing population? The answer is yes. However, the increase of demands is also directly related with climate change. With the growth of production rate, the Greenhouse gases emission also rises. Hence, leading to more aggressive or unpredictable climate change, which of course have negative influence on the production rate. The other side (side effect) of the issue is chemical usage for creating good and for increasing the production rate. These chemicals are mostly used or left on the land or in the water, hence making water unusable and land barren. There are other problems such as diseases, poverty, etc. Consequently, one can see the clear path of chains of one primary issue

Over population is also a driver of a destruction of natural habitat. With the growth of population, increases demands on places and food. A massive landscape is transferred to the living areas, leaving behind fully eliminated formed in many years' ecosystem. Another side of over population as it was mentioned before is increasing the food production. Hence, landscapes are fully altered for different types of yield (Magomedov, 2020).

There are many minor factors that can slightly influence or fully eliminate the ecosystem but, in this work, aim is to outline the danger of alien species.

2 ALIEN SPECIES OR INVASIVE SPECIES

Simply put, it can be described as a species introduced by accident or intentionally into an

ecosystem that does not occur naturally in the region of distribution. There are various definitions and terms for alien species. For example, invasive species are also described as species that intentionally or unintentionally spread into a new environment, causing harm to the ecosystem as well as human health (<http://www.issg.org/>). In addition, according to the United Nations Development Program (UNDP), alien species are the second largest cause of biodiversity loss. Not only plants, but also animals and pathogens can be invasive.

How can these alien species spread in an unknown region (ecosystem)? As mentioned earlier, there are two main scenarios for their introduction: intentional and unintentional. The intentional spread of alien species can be carried out by humans to change an existing ecosystem or completely change it. The unintentional spread of alien species can occur in a variety of ways. For example, alien species can be brought to a new area by wind, rising water, animal migration, tourists, and so on. In recent centuries, invasions of invasive or alien species have become more frequent (Meyerson, 2007; Byers, 2002). The increase is due to the expansion of world trade, the specialization of production and the increase in links with previously isolated places, as well as global distribution (Byers, 2002).

3 POSITIVE AND NEGATIVE IMPACTS OF INVASIVE ALIEN SPECIES ON THE ECOSYSTEM

This paragraph will focus on the advantages and disadvantages of alien and invasive species. Only the main aspects will be considered. Although there are many impacts that are not felt at the moment, but will occur in the future.

3.1 Human Health Relate Problems as a Result of Invasive Alien Species Invasion

3.1.1 Negative Impact of Invasive Alien Species on Human Health

The first thing, which will be valued more than anything, in the modern time, is health of an individual. By any means, if the ecosystem is harmful or hazardous, the region or the area will be altered by removing all the threatening parts or completely changed. The impacts of invasive alien species on human health vary from psychological effects,

discomfort, nuisance, and phobias to skin irritations, allergies, poisoning, disease and even death (Hanley, 2019).

Mainly due to the climate change, some invasive species can be flourishing in different parts of the planet. For instance, ragweed can be seen in the European countries, which came in within the mix of bird feed. Ragweed can be a trigger of hayfever and other allergies (Giuseppe, 2018). These species can be seen as a normal vegetations, but in the reality they can harm and even can get lethal

Another dangerous invasive species are carriers of disease. The Asian tiger mosquito can be carrier of almost 20 different diseases, which can be seen in the southern European countries. Most of the people do not expect some diseases (mostly transmitted from one person to another) can be carried out by the insects. Therefore, it is important to spread the information of such issues.



Figure 1: Example of Ragweed (by Krzysztof Z.).

Similarly, there are different types of invasive species that can cause different health related problems, which of some are unnoticeable and some are lethal. There are some indirect impacts to human health. For example, the red palm weevil is destroying large numbers of palms in the

Mediterranean region, transforming the green spaces in cities.

There are many examples of invasive alien species, that can harm a human being and hence the management of such things have to be prioritized.

3.1.2 Positive Impact of Invasive Alien Species on Human Health

There may be a bright side to the intentional or unintentional introduction of invasive alien species. For example, harsh environments (dangerous plants, dangerous insects, etc.) can be replaced with more sustainable species for humans, animals, or even plant health benefits.

Some species are more resistant to harsh environmental conditions. Thus, it is suitable for most places where vegetation is scarce. This means that the introduction of such species into the environment will smooth it out and therefore create a comfortable living environment for humans.

3.2 Biodiversity

3.2.1 Negative Impact of Invasive Alien Species on Human Health

The negative effect on biodiversity as it was mentioned earlier is distraction or alternation of existing ecosystem. Biodiversity is an ecosystem where different species not only plants, but also animals and pathogens co-existing in synchrony of life. Every piece of it is involved in keeping the whole system working. When one down, the system is at the risk of losing its uniqueness. But when species that do not belong to the system enters it and start to replacing all the diversity it has, the system goes down and dies. In the figure 2 one can see that the invasive alien species is dominating the surroundings and therefore overtaking and replacing the whole diversity it has.

3.2.1 Negative Impact of Invasive Alien Species on Human Health

Sometimes these invasive alien species are deliberately introduced into a new system to breathe life into its dying ecosystem. As mentioned earlier, some species are more tolerant of harsher conditions. Today global warming is changing the suitable weather to the most of vegetation and once one cannot cope with the weather the other one is introduced as it can prosper in such climate.



Figure 2: The threat to biodiversity.

4 SOLUTIONS

By the danger they bring to the ecosystem it is a must do thing to properly manage the spreading process. Management can bring an end to the invasion of alien species and stop distraction at early stage.

By the danger they bring to the ecosystem, it is a must-do thing to properly manage the spreading process. Management can bring an end to the invasion of alien species and stop distraction at an early stage.

Invasive alien species spread not only in small regions, but they can take massive landscapes and similarly dysfunction well-established ecosystem.

In this case, the feasible solution is to utilize modern technologies to control the spreading at its beginning or eliminate them after occurrence. Today, we have so many tools to use to fight the spread of unwanted species in the larger areas. For example, drones with the cameras and built AI capabilities and other useful tools to distribute substances (chemicals like fertilizers and hazardous chemicals to kill the unwanted alien species). The drone can scan a large scale of regions and then the AI can detect (using a spatial algorithm to detect invasive intruders) an invasive alien species and remember the coordinates. After that, with the collected data of information, one can distribute chemical substances to kill the unwanted species distantly (using drones) or by labor. There are other technics to be used in fighting the invasive alien species in the market.

5 CONCLUSIONS

In conclusion, the work was done to outline what are the invasive alien species and what they can do to the ecosystem if left uncontrolled. The effect of Global warming and uncontrolled emission of gasses into the atmosphere were also outlined in terms of how they can influence the invasive alien species prosperity. Also, the overpopulation problem was covered and its links to the global warming. The main goal of the work was to look at the positive if there are any and negative influences of the invasive alien species to the wellbeing of people and ecosystems. And hence if there are issues related to the invaders how to solve the problem by utilizing modern technologies. However, it does not mean that these species to be removed from the new regions. However, this work illustrates that there are two sides of the issue.

Hence, identification and monitoring of invasive alien species can mild the problem that they might bring in the nearest future.

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