Case Report

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A Case Study for Verification of "E = mc²": Calculation of Food Shortage

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Abstract

"Earth Overshoot Day" means that we will begin to manage with the foods that are produced in 1 year in our world on 4 August, which we passed, and only the foods that are stocked in the markets. Albert Einstein tried to draw attention to the use of energy stored in the form of carbohydrates as nutrients in addition to the fertility-enhancing features of the bees, with a question mark from many years ago with the interpretation of "all bees have vanished and humanity has 4 years left." The depletion of the agricultural resources declared on August 4 has turned out to be a threat to humanity.

Keywords: Bees; $E = mc^2$; Earth overshoot day; Evolutionary environment effects; Carbohydrates

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Introduction

According to the Ecological Footprint Atlas, we have lived in a state of ecological overshoot since the 1970s, which means that human demands have exceeded the Earth's biocapacity [1]. Human demands measure the ecological assets that a given population requires to produce the natural resources it uses and biocapacity refers to the productivity of that ecological asset [2]. Human demands alter ecosystems by creating ecological pressures such as land-use changes, resource extraction and depletion (such as deforestation and overfishing), emissions of waste and pollution and the modification and movement of organisms [3]. The resulting environmental impacts include, but are not limited to, climate change, land degradation, loss of biodiversity, and pollution [4-6]. Consequences affect primarily the very poor and vulnerable populations in developing countries through, for instance, famine, water shortages, and competition over resources [7-10].

Methodology

Following sections are explained due to the below physical laws used to calculate the food shortage according to the Einstein's famous quote; Stefan-Boltzmann radiation law, Doppler effect, Stefan-Boltzmann distribution law Section, $E=mc^2$ defines as rest energy.

How food depletion occurs?

In the Earth Overshoot Day platform declares each year nearly 1.3-billion-ton food produced in the worldwide [11]. The Food and Agriculture Organization of the United Nations gives an energy value of each food if the means of the energy content of the foods was calculated it is obtained that it is approximately 21.8 Kj/g.

The overall energy of the food is calculated as $1.3 \times 10^{15} \times 21.8 = 28.34 \times 10^{18}$ j. It means ants and or bees have a role to convert sun energy to food which yearly of 28.34×10^{18} j.

The ideal body that completely absorbs all the energy falling on it is also called the black body. The amount of energy a black body emits by radiating energy per unit time is proportional to the fourth power of temperature. And calculated by Equation 1.

$$E = A\sigma T^4 \quad (1)$$

This statement is known as Stefan-Boltzmann radiation law. Where E is the amount of energy emitted from surface A by irradiation with A, T is surface temperature, and σ is Stefan-Boltzman constant [12].

If the unit energy amount (heat current) W, the surface area m^2 and the temperature are expressed in K, then the size of σ becomes as $\sigma = W/(m^2.k^4)$. The value is 5.6697×10^{-8} W/(m^2.K^4). According to Equation (1), E= 28.34×10^{18} (j).

And if we divide E with the value of σ we have nearly 4.99851 × 10^{26} ($m^2.K^4.s$). Then if we divide with sun surface area of 73080 × 10^{12} (km^2) we, therefore, have 6839,778325 ($K^4.s$). Sun surface temperature is known as 5,778 K so the value of time calculated as 2,2091967 × 10^{-8} hours. It means, one year of food production energy comes from the sun with 2,2091967 × 10^{-8} hours. Also expressed as 67.72 × 10^{14} km/h velocity (distance between earth and sun is 149.6 million km). The energy 28.34 × 10^{18} (j) will be used to calculate the usage of energy in the following section.

For the "Doppler effect" of bees are calculated due to the equation below [13-16].

$$\mathrm{E} = E1+\left(1+V^2/C^2\right)$$

28.34 × 10^{18} = E1 + (1 + (67.72 × 10^{14})^2/(300000)^2)

E1= -2,33522E+19 J means key animals in the world are helping about growing food. For occasions, nectar-eating bats are pivotal pollinators for more than 500 plant species, a considerable lot of which are environmentally huge, fruitivorous bats travel far separations, helping plants to develop and make due in an assortment of areas, so bats have been calling "ranchers of the tropics." honey bees or ants devoured. Termites are detritivores and decomposers, which means they expend decaying plant matter and assume essential parts in reusing environment vitality, and also in adjusting biogeochemical cycles. Not at all like different detritivores, the termite gut is one of a kind in that it contains microorganisms that separate cellulose (building obstructs for plants), which is unpalatable without this advantageous relationship. Seed-collecting ants transport seeds to their supplement rich homes, where plants can securely develop, free of damage from herbivores. Ants in some cases travel far separations with seeds, allowing plants their coveted dispersal objective for less light, space, sustenance, and water rivalry with different plants. For what reason would ants be so kind? Ants appreciate devouring elaiosomes, little structures on the external surface of seeds, without hurting the plant. Ants help in disintegration and turn up more soil than night crawlers. At the point when ants dig tunnels, they circulate air through the dirt and reuse supplements. This action is environmentally significant in keeping up sound soil for plant (sustenance) development. Ants even help decrease the utilization of synthetic manures and the requirement for water system. Huge numbers of us are familiar with seeing honeybees fly around our lawns on summer nights, yet what we may not comprehend is exactly how essential these animals are to our proceeded with presence on this planet. Honeybees are in charge of pollinating roughly 250,000 plant species. Without the honeybees' work, these plants would soon wane into annihilation, which would have a thump on impact on the herbivorous creature species who rely upon them for survival and would in the long run reason meat-eating creatures' numbers to decrease as well, as their prey species vanish. Winged animals play out a wide assortment of natural parts, including woodland decay, bug control, supplement reusing, bio-sign of environment wellbeing, plant fertilization, and seed dispersal. Some ground-abiding winged animals even help circulate air through and turn up soil with their paws. Despite the fact that subterranean insect, termite, bat, and frog species may be the experts of their exchanges, feathered creatures unquestionably appear like the jack of all [17-29].

It is known that in ecological communities, for example, there are reciprocal interactions between plant species and animal fodder or seed distributors. It is known that this interaction varies according to the degree of functioning in nature due to differences in species characteristics. Until now, it has not been investigated how ecological networks correlate biotic function grades with a climatic niche broadness and vulnerability to climate change. The prospect of this research is to prevent species extinction and to break down species from ecological communities under climate change [23]. For this reason, it is tried to explain how the disappearance of species in this study is mathematically expressed and how these creatures depend on the human species. Because human beings are indirectly in direct relationship with other living species in nature.

Because the interactions of plants and their five key pollinators above are the main supporters of terrestrial biodiversity, and it is very important for our society's food safety. Unfortunately, the introduction of alien species into local ecosystems, climate change, widespread use of pesticides, habitat loss and deterioration seriously threaten the integrity of these interactions in a negative way, and these issues need to be investigated. Despite the importance of pollinator interactions with plants, the recent increase in factors that threaten food production due to the above problems suggests that it is also of great importance to determine these interactions [20]. Today, the work in this area is often divided into different disciplines and varies according to the analytical approaches used in most of the studies. However, as biodiversity and interactions are measured in different forms, the focus is on the emergence of results on a wide range of scales and the use of specific methods instead of general scientific hypotheses. Apart from this, nowadays biological diversity and the dynamics that link them are variable, as these dynamics are both dependent on species populations and biomass, as well as their dependence on specific functional groups or key species [27].

Results

According to the Stefan-Boltzmann distribution law [30-32].

$$n_1 / n_0 = e^{-\Delta E/RT}$$

for the population of the humans (n_o)

$$n_1 / n_0 = e^{\left(-2{,}3352210^{19}\right)/8{,}314.\left(6{,}02.10^{23}\right).\left(298.15\right)}$$

n_0 = 0.99860987431. n_0 means world population will decrease by (1-0.99860987431) amount.

Confirmation earth overshoot day by famous energy equation

In modern physics $\mathrm{E} = mc^2$ defines as rest energy and "The energy mc^2 associated with rest mass m rather than motion is called the rest energy of the particle" [33]. So the rest "food stock (= mass)" for the (1-0.99860987431) amount of people can be calculated for the rest of time 1 human needs roughly 9414 Kj/day and if 7.442 billion of people in 2017 lost its (1-0.99860987431) amount there will be reducing 10345316 population of human and;

The total energy is 28,34 × 10^{18} (j) and the rest energy is calculated as 7442000000-10345316= 2292942356 humans and the rest energy are 2292942356 × 9414000 (j) =2,159 × 10^{16} (j)/day. So,

the total human population need 28,34 × 10^{18} (j) 2,159 × 10^{16} (j/day) = 1312,64 day to survive is equal nearly 4 year as Einstein's quotes. So, if bees disappeared humans will have only 4 years to survive [34-42].

Conclusion

The author declares using solar energy to produce food for human population are depending on the key animals which above mentioned ants, bats, bees, termites and also birds. Furthermore, research into the use of renewable energy sources has become an urgent necessity, as well as exploring why global climate is deteriorating, exploring the reduction of carbon footprints and widespread poverty in the world, as well as sustainable development and increased nutritional consumption of means of achieving a cleaner environment. Although some steps have been taken in this direction, such as investigating the effect of microbial organisms, practical measures using 5 key living things are still missing. The year int the Einstein quote is 4 year and calculated is 3,60 year so God gives us 0,4 year more.

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