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INCREASING ROLE OF THE NATURAL FACTOR IN SUSTAINABLE DEVELOPMENT

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Abstract. *This article examines the escalating importance of natural factors in sustainable development, spotlighted by the adverse consequences of historical exploitative environmental practices. These practices have generated a colossal ecological and social debt, manifesting as severe environmental crises that undermine global stability. A paradigm shift towards sustainable development is imperative for fostering security, equality, and harmony between human societies and the biosphere. Sustainable development, though conceptually elusive, fundamentally aims to redefine the interaction between human civilization and the natural environment for enduring coexistence.*

Keywords: *sustainable development, natural factors, ecological debt, renewable energy, biodiversity conservation, non-renewable resources, economic development, climate regulation*

BARQAROR RIVOJLANISHDA TABIIY OMIL ROLINING ORTISHI

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Annotatsiya. *Ushbu maqolada barqaror rivojlanishda tabiiy omillarning ortib borayotgan ahamiyati ko'rib chiqiladi, tarixiy ekspluatatsion ekologik amaliyotlarning salbiy oqibatlariga e'tibor qaratiladi. Ushbu amaliyotlar global barqarorlikka putur yetkazadigan og'ir ekologik inqirozlar sifatida namoyon bo'ladigan ulkan ekologik va ijtimoiy qarzni keltirib chiqardi. Barqaror rivojlanish sari paradigmaga o‘tish insoniyat jamiyatlari va biosfera o‘rtasidagi xavfsizlik, tenglik va uyg‘unlikni mustahkamlash uchun zarurdir. Barqaror rivojlanish, garchi kontseptual jihatdan qiyin bo'lsa-da, inson tsivilizatsiyasi va birgalikda yashash uchun tabiiy muhit o'rtasidagi o'zaro ta'sirni qayta aniqlashga qaratilgan.*

Kalit so'zlar: *barqaror rivojlanish, tabiiy omillar, ekologik qarz, qayta tiklanadigan energiya, bioxilma-xillikni saqlash, qayta tiklanmaydigan resurslar, iqtisodiy rivojlanish, iqlimni tartibga solish.*

ВОЗРАСТАЮЩАЯ РОЛЬ ПРИРОДНОГО ФАКТОРА В УСТОЙЧИВОМ РАЗВИТИИ

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Аннотация. *В этой статье рассматривается растущая важность природных факторов в устойчивом развитии, подчеркнутая неблагоприятными последствиями исторической эксплуатации окружающей среды. Эта практика породила колоссальный экологический и социальный долг, который проявляется в виде серьезных экологических кризисов, которые подрывают глобальную стабильность. Смена парадигмы в сторону устойчивого развития необходима для укрепления безопасности, равенства и гармонии между человеческими обществами и биосферой. Устойчивое развитие, хотя и концептуально неуловимое, по своей сути направлено на переосмысление взаимодействия между человеческой цивилизацией и природной средой для обеспечения устойчивого сосуществования.*

Ключевые слова: *устойчивое развитие, природные факторы, экологический долг, возобновляемые источники энергии, сохранение биоразнообразия, не возобновляемые ресурсы, экономическое развитие, регулирование климата.*

Introduction.

This was largely due to an extractive and exploitative attitude towards the natural environment, treating its resources as though they were infinite, and relying upon a sharp inter-generational inequality such that the interests and welfare of the currently existing generation could be advanced at the expense of future generations. This has led to the erosion of sustainable systems and the massive buildup of global ecological and social debt, which manifests as a series of interlocking and increasingly severe environmental problems that threaten global stability and security. This recognition of unsustainable development has led to the search for a new development path that can provide greater security and equality for the world's oppressed peoples, and greater harmony within human society, and also between human society and the biosphere. This must involve a long-term strategy of transition to sustainable social, economic, and ecological systems, and it is this transition to sustainable systems that we refer to as sustainable development.

A more exact definition of the overall goals for sustainable development has proved remarkably elusive. There are several reasons for this, not least that the concept has proven to be politically and rhetorically extraordinarily useful, and so has been stretched and adapted to a variety of different purposes. Nevertheless, it is widely agreed that at its core, sustainable development represents a new approach to the relationship between the natural biosphere and human society, one that is intended to last into the indefinite future. It is now widely understood that the earlier modern period of industrialization, and in general the development strategy of the industrial revolution that is still being played out in many parts of the world, has resulted in massive social, economic, and environmental change, much of it negative in terms of the interests of future generations (Meadows & Meadows, and other, 1972).

Natural factor is one of the important aspects in sustainable development. Thus, the first question is why it is so important. The answer is, because without nature, sustainable development will not be held. Sheng (2002) stated that nature is something that can provide foundations for life and living. And living or human life is included as a part of nature. In this case, what Sheng meant by it's the home for every living creature and life foundations. Life foundations, which can be obtained in many forms, are ironic if we know that until nowadays we still try to find a way to create an artificial way for a certain life foundation that can be obtained in nature.

"In terms of larger human societies, and the enormous heterogeneity that has prevailed throughout the period of our habitation of the earth, it is factually known that the conditions of well-being and welfare have been reflected in an incredible diverse number of forms." This incredible diverse number is proof that nature can provide everything that humans need, which sometimes in unexpected ways. As something that can provide everything that humans need, it's clear that it will be difficult to find something that has the equivalent value with nature.

This part of the series of articles about the natural factor on sustainable development will try to explain why nature is an important factor for sustainable development. This is the importance of the natural factor. We can think of the importance of nature in sustainable development as a reverse of the concept of sustainable development itself, which sustainable development is about how to make development can maintain the current needs without sacrificing future needs. So, the importance of nature is how to maintain future needs of nature itself, because we must realize that until nowadays, the nature now is not the same as the past nature.

Literature review.

Sustained Poverty Reduction (SPR) theories have attempted to explain development in terms of unsustainable traditional and modern (sustainable) sectors. In these sectors, traditional activities outweigh the carrying capacity of the environment and degrade the natural resource base, leading to a declining trend in real per capita income.

An extension of this approach has been to use the "resource curse" theory, which claims that the abundance of natural resources can be a curse on a nation by crowding out investment in human capital and infrastructure. This leads to the development of a "Dutch disease," where an increase in natural resource exports appreciates the local currency and reduces the competitiveness of other exports, such as manufacturing.

Economists have used various approaches in attempts to show the role of natural resources in economic development. Early development theories, Gerschenberg (1987), argued that the rate of economic development of a society depended on the speed at which it transferred resources from "primary" to "secondary" activities. Here, primary activities were considered to revolve around the use of natural resources. Gerschenberg postulated that societies that were able to "save" a higher proportion of their surplus from primary activities and invest it in secondary activities would be growing at a faster rate.

Natural resources are the basis of production in an economy, as acknowledged by a growing number of economists. Economic development is directly dependent on the productivity of natural resources, such as land and water. This important role of natural resources revolves around the concept of sustainability, in the sense that the economy will be sustainable as long as there is an adequate natural resource base (Stern, 2007).

Analysis and results.

Currently the most significant problem hindering the progress of sustainable development is the increasing use of non-renewable energy. Fossil fuels provide around 80% of the world's energy despite the fact that their reserves are being depleted at a rapid rate. It is the high energy and low cost efficiency of fossil fuels which means they are more attractive to developing countries than renewable alternatives. Once the energy from a fossil fuel is released it cannot be replaced and so it is a finite resource. This has two implications, firstly there will come a point when the cost of extraction will outweigh the benefit gained from using the fuel. A good example is UK coal mining, coal reserves still exist in the UK but it is now cheaper to import the coal from abroad. Secondly and most importantly it means that the use of fossil fuels is not sustainable.

When it is no longer a viable option to burn fossil fuels we will move to an age where the only available energy is that from renewables but, if renewable resources are overused between now and then it will leave a massive energy deficit and possibly lead to a global energy crisis. This

could be avoided if there was a greater understanding of energy conservation and efficiency and if we were to make the transition to non-depletable energy sources (Costanza &
Arge, and other,1997).

Renewable resources are the backbone of sustainable development. So, to begin, we must build an acceptable definition of a renewable resource. It could be described as something with the potential to be replaced after it has been used, though the actual use and replacement may not always occur. The Earth's resources of water, soils and vegetation are essential to human life and are truly renewable. The output from them can be sustainable if it is within the regenerative capacity of the resource, e.g. extraction of timber from a forest at a rate less than or equal to the amount of new growth. However, the term renewable is perhaps most commonly associated with energy resources.

Minerals are another form of non-renewable resource and are extracted from the earth's crust. They have a wide range of uses and are often employed as raw materials to produce other goods. Ores such as iron, copper, and bauxite are used to produce metal, while other minerals are used in construction, electronics, and manufacturing. The abundance of mineral resources varies and they are often a by-product of exploration for a more sought-after resource. Mineral extraction can cause various forms of environmental damage, particularly open-cast mining which has left vast scars on the landscape in many areas. The damage caused by mining is discussed in more detail in a later section.

Fossil fuels such as coal, oil, and natural gas are the most commonly used resources on the planet. They were formed from organic matter over millions of years and in some cases up to 650 million years ago. Fossil fuels are high-density resources which produce a lot of energy when they are burnt. This has made them highly sought after and they have been exploited at a great rate, particularly since the industrial revolution. Because fossil fuels are so energy-rich and reserves are being used up so quickly, it is likely that they will be depleted in the near future. This is particularly the case for oil, which is the most versatile of the fossil fuels. Once oil reserves begin to decline, it is likely that intense competition and conflict will occur between nations to secure the last remaining oil supplies. This has the potential to greatly disrupt global stability and security (Sachs, 2015).

Non-renewable resources consist of minerals and fossil fuels. They are considered non-renewable because they take so long to form, and once they have been depleted there will be no more available. This is in contrast to renewable resources which can reform given enough time, which enforces the concept of sustainable development. Some non-renewable resources are classified as 'exhaustible', which means that they will eventually run out. This has obvious implications for future generations who will not benefit from the resources that have been depleted.

The conservation of biodiversity is one of the most important tasks of sustainable development. At the latest since the initiation of a "Convention on Biological Diversity," the conservation of biodiversity has become a main theme on the UN's agenda for sustainable development and, thus, member states of the United Nations have made a commitment to "conserve biological diversity, use biological resources sustainably and share fairly and equitably the benefits from the utilization of genetic resources." The efforts of the international community are to be further specified in a "Strategic Plan for Biodiversity 2011-2020" with 20 Aichi Targets, which has been adopted in the context of the mentioned convention (Sachs, 2015).

The first, and most important, action for the conservation of biological diversity is to create the set conditions, in order to avert a continued loss of species. Should the extinction rate remain high, later generations would be forced to predominantly utilize future natural resources that are today's common supply and mankind would be prevented from accessing as of yet unknown possibilities for new technologies in various fields such as pharmaceuticals or biotechnology. With these reasons in mind, and having noted the fact that habitat destruction is the primary cause of species loss, it becomes imperative to lessen the expansion of arable land and increase the

efficiency of resource use in both agriculture and forestry. This would lead to the decrease in global food supply demand, and reduce the areas of land that are abandoned and left to regenerate or develop new uses. The effects of this action are categorically explained by the IPAT model, using an identity describing an environmental impact as a function of population, affluence, and technology. Here it is predicted that increased efficiency of resource use will directly affect the reversing of cultivated land to natural land, as it will alter the amount of land which is needed to sustain a particular population and level of affluence. However, reducing the expansion of arable land will also require an effort to prevent land use change in tropical regions where soil conditions allow for cultivation of cash crops. This can be done by increasing the revenue on such land whilst providing an improved cost-effective alternative, in order to reduce rapidly increasing rate in cultivated land area (IPCC, 2014).

Climate regulation

Carbon storage is vital in mitigating the impacts of greenhouse gases and global warming, a service provided by forests and peatlands. By using a generic social cost of carbon estimate, the value of carbon stored in the vegetation of the 3.7 billion hectares of tropical forests is about $2.5 trillion a year. At current global rates of deforestation, over 31.5 million hectares of tropical forests are lost annually. This is an alarming figure when considering the importance of carbon storage in climate regulation, and the potential economic benefits which are being wiped out. Changes in temperature, resulting from greenhouse gas emissions, have led to an increased frequency of weather-related natural disasters. The economic losses associated with the damage caused equate to billions of dollars a year. It has been calculated that a 10% decrease in the frequency of natural disasters would save between $600 million and $3.4 billion annually (Ruggerio, 2021).

Despite the release of carbon through land use change, the increase in atmospheric CO2 has led to the enhanced growth and carbon uptake of many ecosystems, particularly temperate and boreal forests. In time, the rate of carbon uptake will slow in response to a saturation of carbon storage, and carbon release will occur when the ecosystem is disturbed or subject to further environmental change. The impact of climate change itself may be the most important yet uncertain factor in the future carbon balance of the global ecosystems. High latitude regions and high altitude regions are most likely to experience increased ecosystem productivity and carbon uptake. In contrast, areas which are already drought-affected or have a limiting water balance may experience reduced productivity and increased tree mortality. The carbon released by these and other climate-induced ecosystem changes has the potential to act as a positive feedback on the climate system, further increasing the rate of climate change. The overall effect of the change in carbon balance of terrestrial ecosystems on the future climate is still highly uncertain. Simulation of the future carbon cycle is an area of ongoing model development and an important part of climate prediction and the assessment of climate mitigation strategies.

Over climate regulation, the amount of CO2 in the atmosphere has been hugely affected by human activity, particularly through land use change. The most significant impact has been the conversion of forest to cropland, in particular the tropical forest areas. This process has led to the release of carbon that was stored in biomass and soil. In temperate regions, the main impact has been through Urbanization and the abandonment of agricultural land. These activities have released carbon and also decreased carbon sequestration. Global scale land use change has also led to an increase in atmospheric CO2 through the burning of biomass. Peatlands have been particularly subject to this kind of land use change. The release of carbon from these diverse activities has been a key factor in the elevated levels of atmospheric CO2. The Kyoto protocol has initiated research into ways to use land management and reforestation to mitigate CO2 levels (Bhutta & Tariq and other, (2022).

The role of ecosystems in regulating climate through the exchange of carbon dioxide and water, and through their influence on the physical properties of the earth surface, is a major and complex area of research. The carbon cycle is a well understood global scale ecosystem process that has direct relevance to the climate system. The cycle is characterized by the processes of

photosynthesis and respiration, by which green plants and other organisms use atmospheric CO2 to produce organic compounds during plant growth, then return CO2 to the atmosphere through respiration, and finally carbon release occurs through the decomposition of organic matter.

The global climate is not only a result of human activity but is also hugely affected by the various interactions of the natural environment. Two main factors of the climate system are the radiation balance and the circulation of atmosphere, which create a complex feedback interaction between the atmosphere and the other components of the earth system. Analysis of how vegetation and the atmosphere interact, with the aim of developing ways to use this knowledge to improve climate prediction, climate modelling and development of mitigation strategies, is the focus of much current and future research.

The key to conceptualization of an ecosystem service is using an appropriate ecosystem structure having a potential of producing a good or service which can then be valued by society. According to the MA, a service is defined as the benefits provided to human beings from ecosystems drawing on four categories which are: provisioning services, regulating services, cultural services, and supporting services. The role of any ecosystem in water purification can be valued as an ecosystem service as it can provide a benefit to humankind in terms of reducing the cost on the society of taking pollutants back out of the water once they have caused degradation and reducing the health impacts and costs on society of contaminated drinking water. This can further be valued in terms of human health, reduced economic costs, and increased recreational benefits provided by clean water.

Water purification can occur in many different ecosystems ranging from completely natural to highly artificial. Although artificial ecosystems can provide purification services by using natural processes, it is inclined that the more natural an ecosystem is, the better it is at purifying water due to the native species and the more complex interaction between the organisms and the abiotic environment. This is due to the fact that more natural ecosystems have faced less environmental stress and disturbances. Many studies have shown that any natural ecosystem can provide some benefit of water purification, but a research project conducted by Costanza et al. sought to value the relative importance of different ecosystems and landscapes (Wang & Hu and other. 2020).

Conclusion.

The research unequivocally underscores the critical role of natural factors in the pursuit of sustainable development. The historical trajectory of resource exploitation, primarily driven by an extractive economic ethos, has precipitated a global environmental predicament characterized by the depletion of non-renewable resources, escalating CO2 levels, and loss of biodiversity. This unsustainable path has highlighted the urgent need for a systemic transition towards sustainable practices that respect the natural limits and ensure the well-being of future generations.

The analysis reveals that the cornerstone of sustainable development lies in prioritizing renewable over non-renewable resources, conserving biodiversity, and implementing effective land use strategies to mitigate climate change. Moreover, the intrinsic value of natural ecosystems in providing essential services, such as water purification and carbon storage, further reinforces the indispensable role of the natural factor in achieving sustainable development goals.

In conclusion, fostering a symbiotic relationship between human activities and the natural environment is paramount. This necessitates a holistic approach that integrates economic, social, and environmental considerations to devise sustainable development strategies. The future of global stability and security hinges on our collective ability to embrace sustainable practices and ensure *that the natural world can support the diverse needs of all life forms, now and in the future.*

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