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Review Article

Green Horizons: Shaping the Future through Environmental Priorities

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A B S T R A C T

Life on earth for either humans or any other living organism is crucially balanced by the components of an ecosystem. This crucial balance is what keeps this planet breathing with all life, but in the worst condition, each of us has been facing the risk of our existence being washed out and the earth being barren. The question arises to us about polluting the environment, destroying the environmental heritage, and misbalancing the living-non-living cohort. As a supreme organism, we seemed irresponsible for our planet, and it's high time to correct or make mistakes and realise rather than repent of what has been done. We, as such supreme beings, can seek innovations and initiatives that can protect our future generation and their needs.

Keywords: Environment, Sustainability, Green Technologies, Energy

Introduction

The environment, as defined as the cohort of all biotic and abiotic components, involves the interactions between organisms themselves and their co-interaction with the ecosystem.

This interaction can persist only if there is a cycling action involving give and take. But the current scenario in ecosystems, where humans have been deriving resources from the environment without supporting its protection and not realising that ecosystems should sustain life for all, is the subject of concern.

Yes, it is a heartbreaking fact that the environment has already deteriorated to the point that we can't in any way revive it back to the original ecosystem with the correct balance of components. Thus, the only thing we humans right now can do is

- To act promptly to minimise the effects of what has been done
- To ensure that nothing in the future will contribute to such effects.
- To promote actions that will revive the environment

And to achieve these important goals, we can expect our technologies to be environment-friendly and have a clean footprint on the future of the ecosystem.

Future Energy[1]

Energy is the backbone of every development that we see in the world, but the energy, its source, and the process to harness it have to be clean and green so that the future will not be suppressed under the impacts of these non-renewable sources. The time is gone to seek out coal mines, oil reserves, fossil reserves, etc. to fulfil our needs. These resources has to be replaced by wsources that are perpetual and the process to derive energy from them is cleaner. Figure 1 depicts various forms of renewable energy and few of the supporting candidates are discussed below.

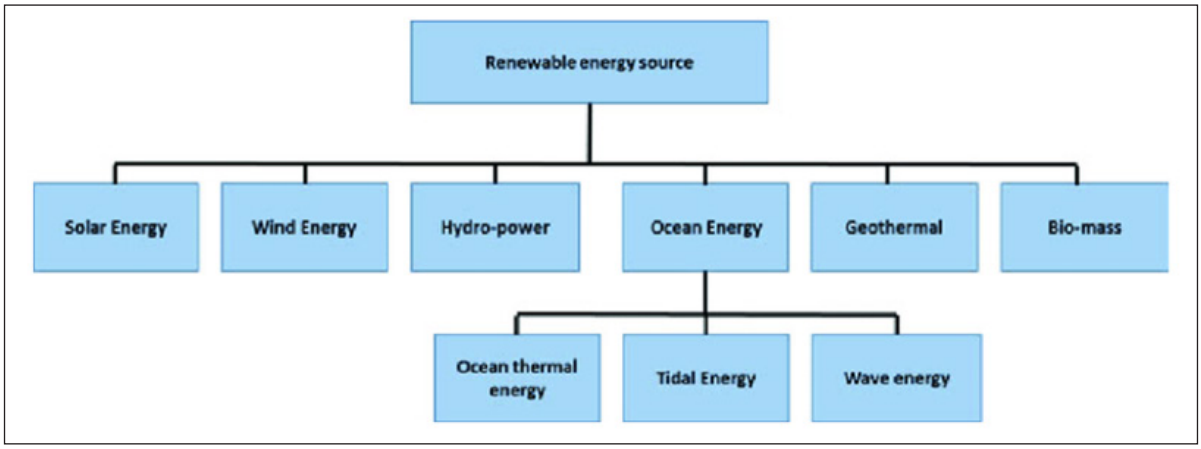

Figure 1.Fundamental renewable energy system and its classification[1]

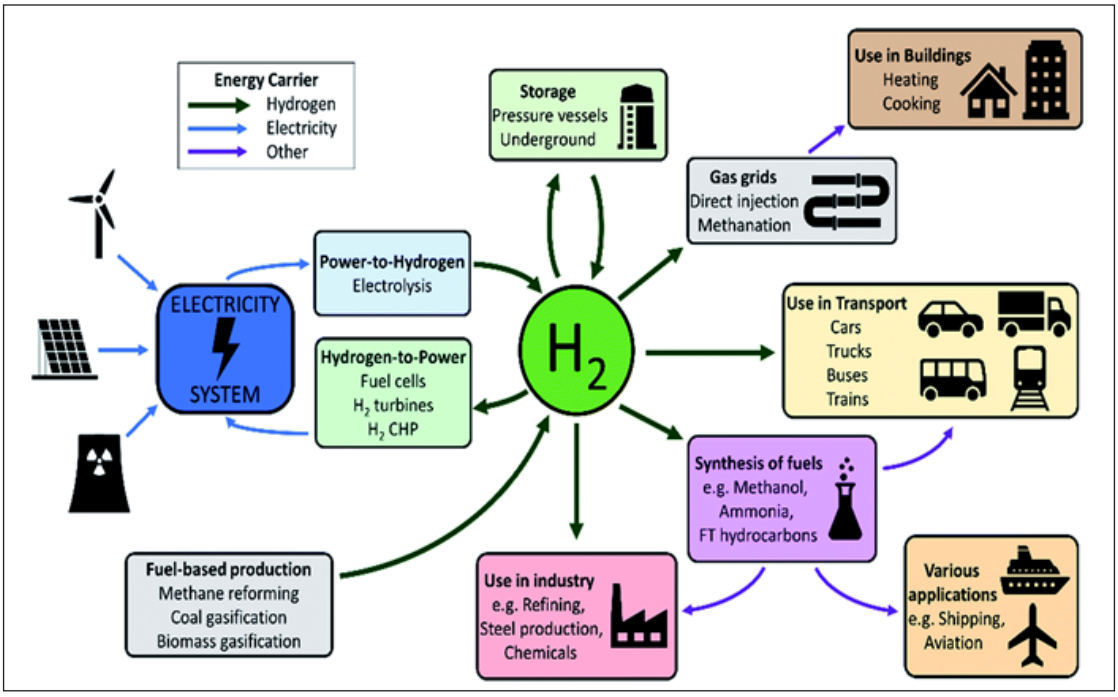

Figure 2.Use of hydrogen as a fuel[3]

Solar Energy

The sun has been the light of life and the biggest reason that the earth supports life to flourish in it. The sun is basically the source of everything and of every kind of energy that has been used to date. The sun radiates an enormous amount of energy, but on earth it is received as a small fraction that, if we are able to harness it properly, can meet our needs. Solar energy can be crafted into electricity using photovoltaic cells embedded in solar panels. Using these solar panels extensively can surely help us derive a huge amount of energy, but the problems associated with them, such as the wastage of land used to insert solar plants, are concerning. Solutions to such problems have emerged recently, such as floating solar plants in water and thin sheets of solar panels that can be pasted on walls, roads, houses,houses etc. These solutions can help meet the need for green buildings and houses that run on solar power and can support human needs.[2]

Nuclear Energy

Nuclear energy that can be derived from the fission or fusion of nuclei is potentially the candidate with the largest one-time output of energy. So far, only nuclear fission has been achieved using radioactive materials. But this energy, too, is associated with problems. The radiation pollution resulted from improper handling of nuclear fuels can be disastrous, given the huge impact it can have on the environment. Thus, the side-wise development of systems to manage nuclear waste and control radiation hazards is crucial so that it can be a more common form of energy rather than a few distributed by powerful countries.

Hydrogen Energy[3]

The future of humanity can be hydrogen-powered. We may see all the technologies, ranging from land to air transportation, running on this mighty fuel, as the byproduct of this fuel is pure water. But environmental concern arises at the point when we manufacture the machinery that is used to produce hydrogen and that uses hydrogen as a fuel. The hydrogen that we use today is blue, which is not carbon neutral, but we can refine our technologies to go for green hydrogen as our future fuel. Figure 2 shows how H_2 can be harnessed as fuel and can contribute to a greener environment with less carbon emissions. This advancement may take time, but to protect the environment, it will have to be common.

Bio-Energy

This is the energy derived from biomaterials. It includes biofuels, biomass energy, etc. Traditionally, it was just a concern for household alternatives for simple purposes, but recent advancements in these methods have made them the potential energy sources for transportation, industries, and households. These fuels and energies not only include bio-products such as methane and gasoline but also a range of fuels derived from microalgae's and cellulolytic bacteria's. They are efficient means of energy and are easy to produce compared to other fuel alternatives. A schematic representation of bioenergy and its utilisation is shown in figure 3.

Sustainable Technologies and a Green Future[5-10]

The future of humanity is already at great risk, imposed upon them by themselves. Thus, the solution has to come from us ourselves. As technological innovations have surged for human capacities to win over everything, they will serve for the protection of humanity as well (as represented in figure 4(a)). In order to save the future of humanity, our technologies should work on the concept of sustainability so that their future will not be challenging to nature. So renewable and perpetual resources are to be utilised for the implementation of these technologies. Each and every innovation that has served human purpose to date has been an equal curse for the environment and its crucial balance. Hence, technologies with a more refined work structure that can be eco-friendly, utilise energy derived from natural sources, and leave no footprint of harmful effects are the driving tech initiatives of the future. These sustainable technologies potentially have to minimise the environmental impacts of our past and should have no effect on the same as well. These technologies can be broadly understood under the following headings for how we can go green.[5-8]

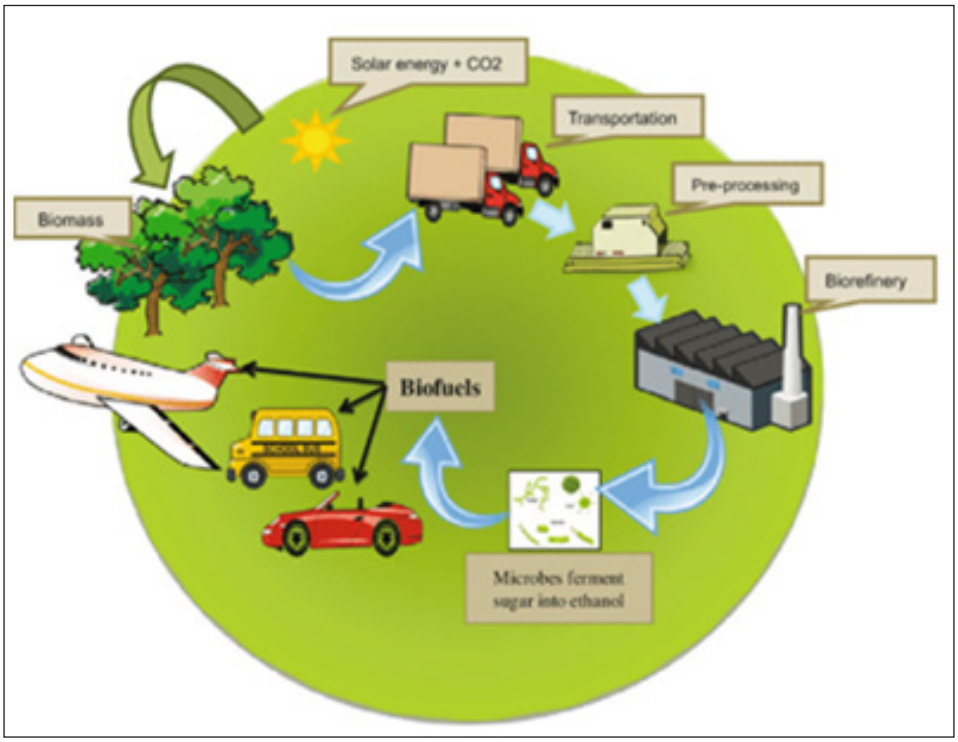

Figure 3.Applications of Bio-fuels[4]

Figure 4: (a) Sustainable Green Technologies and (b) Green settlements [Google Source]

Green Settlements[10,11]

Housing and settlement in the present scenario use materials and designs that are not consistent with energy balance and sustainability. Human settlements using materials that are produced with less deterioration of resources have to be employed, and these settlements should run on renewable resources such as solar power. Production of non-biodegradable wastes should be reduced from its root (reduction in manufacturing and use of such products).The cyclic balance of ecosystems should run from reducing and reusing to recycling, such that a settlement produces and uses within without an extra production of unwanted waste for the environment. With these measures, settlements can be compatible with ecosystems. A pictorial representation of green technology and green settlement is given in figures 4 (a) and (b).

Green Transportation

As for our attention, the transport sector has been the major sector polluting the environment. To minimise this and to completely nil such effect currently, this sector has been utilising various alternatives such as electric vehicles, vehicles, and aircraft powered by biofuel, hydrogen, etc., which helps reduce the energy consumption per person per km of distance travelled. But not only the use but also the also the production of such alternatives should also favour the capacity of nature. These initiatives should not only be concentric to advancement but should also promote the circular economy and comprise the correlation of all the economies.

Green Food

The most important aspect of living is food for every organism. Due to the destruction of cultivable lands and massive deforestation, the biogeochemical cycle has been disturbed to the greatest extent. Soil quality and fertility will not be able to serve human needs in the coming decades, and the situation cannot be reversed. Hence, the method of production of food resources should be advanced using advanced techniques that use less soil and water, which is enough for the needs of humans. Techniques involving organic farming, vertical farming, hydroponics, etc. can be the future technologies in agriculture that can feed us (a representation of which is given in Figure 5).

Figure 5: Vertical Aquaponics and Green Building [Google Source]

Conclusion

The future of humanity will be dark if actions against these devastating behaviours are not taken. To resolve these, we will have to replace conventional energy sources completely by 2050, introducing renewable resources. The cities of the future should be smart and green, where

every house will be covered with walls of solar panels, and greenery will be its breath. Industries and transport would run on more efficient means of energy, such as biofuel and hydrogen, and the carbon footprint would go neutral. The use of resources by communities will be sustainable. The circular economy should be the heart of future and water and forest resources would be minimally exploited. The use and production of harmful wastes would be mitigated. Overall, the future will go green, but an effort has to be made by every individual from every sector so that all the sectors can make themselves compatible with the capacity of the ecosystem.

Protection of the environment with the use of sustainable technologies is the only way we can assure the sustainability of life on this green planet. Till all the methods of living and utilising resources shift to a green culture with a neutral impact, humans shall face the devastating impacts of their own doom due to themselves.

References

1. Khan SA, Al-Ghamdi SG. Renewable and integrated renewable energy systems for buildings and their environmental and socio-economic sustainability assessment. InEnergy Systems Evaluation (Volume 1) Sustainability Assessment 2021 Jun 2 (pp. 127-144). Cham: Springer International Publishing.
2. Bosu I, Mahmoud H, Ookawara S, Hassan H. Applied single and hybrid solar energy techniques for building energy consumption and thermal comfort: A comprehensive review. Solar Energy. 2023 Jul 15;259:188-228.
3. Wolf E. Large-scale hydrogen energy storage. InElectrochemical energy storage for renewable sources and grid balancing 2015 Jan 1 (pp. 129-142). Elsevier.
4. Qidwai A, Shukla SK, Kumar R, Pandey A, Dikshit A. Introduction of nanotechnology in the field of biofuel production. Green Nanotechnology for Biofuel Production. 2018:29-38.
5. Wu J, Strezov V. Green technologies and sustainability: A new trend. Green Technologies and Sustainability. 2023 Jan 1;1(1):100008.
6. Chen L, Hu Y, Wang R, Li X, Chen Z, Hua J, Osman AI, Farghali M, Huang L, Li J, Dong L. Green building practices to integrate renewable energy in the construction sector: a review. Environmental Chemistry Letters. 2023 Dec 15:1-34.
7. Bungau CC, Bungau T, Prada IF, Prada MF. Green buildings as a necessity for sustainable environment development: dilemmas and challenges. Sustainability. 2022 Oct 13;14(20):13121.
8. Balaban O, de Oliveira JA. Sustainable buildings for healthier cities: assessing the co-benefits of green buildings in Japan. Journal of cleaner production. 2017 Oct 1;163:S68-78.
9. Dey S, Sreenivasulu A, Veerendra GT, Rao KV, Babu PA. Renewable energy present status and future potentials in India: An overview. Innovation and Green Development. 2022 Sep 1;1(1):100006.
10. Buonomano A, Barone G, Forzano C. Latest advancements and challenges of technologies and methods for accelerating the sustainable energy transition. Energy Reports. 2023 Dec 1;9:3343-55.
11. Castro-Mejía J, Castro-Mejía G, Castro-Castellón AE, Martínez-Meingüer AM, Reséndiz-Corona A. Preliminary study of Oreochromis niloticus, Coriandrum sativum, Anethum graveolens, and Petroselinum crispum growth cultured in Biofloc/aquaponic system. Int J Fish Aquat Sudies. 2020;8(3):217-22.