Book Review

Dawn of the Solar Age: An End to Global Warming and to Fear

Prem Shankar Jha. 2018. SAGE India.

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The world has been a witness to the vast variations taking place in the climate and the environment since the past few decades and these climatic changes have deteriorated the living conditions for the people throughout the Earth. In reference to the environmental issues, the book *Dawn of the Solar Age: An End to Global Warming and to Fear* drives the reader through an in-depth study of the environmental transition and also explains the role of humans throughout this transition. Section-wise this book reviews the environmental and climatic changes happening around and explains how the human beings have dealt with them. Since these climatic changes are so substantial, addressing them has become an important part to augment the survival of the human era and the planet and this book has been successful in addressing these concerns. The author has, throughout the book, supported his views with scientific proofs and results from famous studies and has successfully validated the content.

In the first section, the author briefs the readers and provides an insight into the frantic situation that has been created with the enormous amount of carbon dioxide (CO_2) that gets released into the atmosphere every day. The world has rapidly industrialized in the past few decades which has constantly pushed the further need for economic activities which generate large amount of CO_2. According to the author, by 2010 energy equal to 4,00,000 Hiroshima-sized nuclear bombs has already been released into the atmosphere and even if we cut down the carbon emissions drastically from today, we will still not be able to save the planet. The accelerating accumulation of CO_2 and other greenhouse gases (GHGs) has not only created a temperature anomaly on the land but also in the oceans and is one of the major cause of the super El Niño. The book refers to many major geological studies by James Lovelock, Lee Kump, James Hansen, and Harry Elderfield that have warned that if such a situation persists, the earth will cross its tipping point, resulting in everything going out of human control. The author has also pointed out that the projections made by the Intergovernmental Panel on Climate Change (IPCC) on the sea level rise were highly flawed and misled the scientists.

As mentioned in the report, *Limits to Growth* developed by a team of MIT researchers, if humans continue to pollute the environment uninterruptedly, the ecological system will collapse very soon, hence the need of a solution. This book refers to some extensive studies, such as the *Atmosphere of Hope: Searching for Solutions to the Climatic Crisis* by Tim Flannery that suggest future solutions for the impending crisis. The author tries to give an insight to all the possible and available alternate energy sources that could aid in lowering environmental degradation, such as wind power, solar photovoltaic power, tidal energy, and geothermal energy. Despite the availability of the

widespread alternative energy sources and the continuous technological advancements, coal is still the top producer of energy. This is due to the low acceptability to the changes by human beings and also the existing infrastructure which would require a huge amount of investments coherent to the technological changes, requiring a strong presence of state's role in the economy. Along with providing suggestions and solutions to the climatic problems, the author has emphasized the role of the government in bringing the transition. This practical approach presented in the book creates a clear solution path into the minds of the reader that needs to be followed and also to learn from the past mistakes of several organizations and governments. As an alternative to the thermal power plants as the source of energy, the rise of solar and biomass have also been stressed by the author.

The second section of the book focusses on explaining the alternative energy fuels and their role along with futuristic steps that have to be taken to bring them in the loop of the economy. The breakthrough that can replace both coal and nuclear power is the solar power-generation capacity. A lot more remains needs to be completed in order to initiate this shift. The author clearly describes the advantage of a concentrated solar thermal power plant (CSP) over a solar photovoltaic cell (SPV), stating them to be both economically and ecologically viable. Despite teething problems in major initial CSP plants, such as the United States' Ivanpah and Andasol of Spain, these plants have managed to achieve around 40 per cent of their rated capacities. Other than giving supporting reviews on the CSP plants, the author has also emphasized on the drawbacks of these plants and how they face unrelenting criticism by the votaries of SPVs. This in-depth study by the author on SPVs and CSPs can be used as by many scientists and academicians as a reference for the future.

The rising demand for oil and gas is largely fulfilled by the non-renewable resources today but the irony is that these resources will not last for long and thus need to be urgently replaced with other viable alternatives. One such underestimated and unexplored energy alternative is biomass, the use of which can solve major problems. Usually, scientists do not prefer the use of biomass as a key future alternative but the author herein has strongly supported the rise of biomass as a renewable resource which has ample potential and methanol and ethanol being such biomass fuels that have been quite popular since the past few decades. Similarly, the author has shed light on certain other non-conventional fuels, such as municipal solid wastes. According to a study cited in the book, human beings generate around 1–2 kg of garbage daily. With rapid industrialization, this amount of solid waste is increasing exponentially and is the primary cause of large-scale problems in urban cities due to the scarcity of land and mechanisms to deal with it. In low-income countries, the problem is larger as garbage is dumped in insanitary landfills or left to litter the sidewalks and rot in the sun. Adding to this, the municipal authorities in New Delhi collect more than 10,000 tonnes of solid waste daily. Surprisingly, this amount of garbage is sufficient to cover a football field more than 4 m deep in muck. As pointed out by the author, if this waste is turned into syngas instead of being dumped or burned, it will not only reduce the carbon emissions and solve the serious problem of dumping but will also create a source of energy for the future as a part of transport fuels.

Even after pointing out clearly the urgent need of a major transformation, the author agrees that practically this is not so painless; rather it needs the support of the market and market forces. The crucial problem is the unacceptability or the persistent resistance that is rooted to adopt new technologies and inventions both by the market and the consumers. Though economic theories and economists have always supported innovation, be it Joseph Schumpeter or Karl Marx, leading ultimately to competition and expansion of the market, thus regulating the prices but, practically, this approach is not so easy to follow. Broadly analysing the practicality of the situation, the author has explained where the world and the policies went wrong in both

identifying and achieving environmental goals. Supported by valid facts and theories, the author successfully demonstrates that today a situation of panic has set in and the climatic forces may sweep away the world in the future.

The book has notably pointed out all the solutions that could help in saving or extending the life of the earth, whether these are inexpedient or empirical. In giving his reviews and suggestions, the author has been quite straightforward throughout the book such that if we want to give the next generation a chance to live, then we would not only merely need to bring down the carbon emissions drastically but also extract large amounts of CO_2 already present in the atmosphere. The author has managed to maintain a sense of positivity throughout the book in saving this planet and be able to create a better life for the future generations with a cleaner environment. This book describes not only the case of the world as a whole but has also managed to address the issue with an indepth study of a country and further raised the issue at the city level. As we are all aware, New Delhi in 2017 faced the problem of high particulate matter concentration due to stubble burning in the nearby areas, raising the air quality index to a very high (999) and this has since then been a major issue for the capital city. Thus, the author has explained the ways that this situation can be avoided in the future and it can serve as important content that can be used by the policymakers of the country. The solutions pointed out by the study will not only manage to bring in many alternatives to transport fuels but will also be economically viable for the country at the same time.

The book concludes with a deep study of the environmental situation of India and the major issues it has been facing and how has the government dealt with them till date. Yes, the true picture of the country is quite gloomy; however, the author has a positive approach to bridge the gap between the expectations and realities in the future. The author suggests that now it is the high time for not just the developed economies but also for the developing economies, such as India, to step up and explore other energy alternatives, such as solar, biomass, and wind energy. Despite having the fifth-largest coal reserves in the world, India has been consistently suffering from an endemic power shortage, peaking at 13.5 per cent of its total requirements, especially solar will act as a major energy alternative in the future. Thermal power plants are, however, not only the source of energy disrupting the ecological scenario of the planet. As identified by the author, hydropower plants have also been a serious threat to the ecology and have already destroyed much of the Himalayas and been a constant reason for the persistent floods and landslides in several parts of India.

Hence, this book distinctly indicates the serious threats to the human dynasty and to the world that underlie in the near future, if no urgent steps are taken to address the environmental issues. Global warming and other damages to the planet have exaggerated so much since the last three decades that if the situation is kept uninterrupted, unfortunately, the world will not survive even the next 20 years. The author of this book should be applauded for addressing these major issues and bringing them out before the world so firmly and at the same time supported by credible content and certitude.