

# ***The Current Situation of the Environment and Natural Resources and Blueprint of Green Economy***

**Yanbo Jia<sup>1,a,\*</sup>**

<sup>1</sup>*Department of Economics, University of Warwick, Coventry CV47AL, United Kingdom  
a. yanbo.jia@warwick.ac.uk*

*\*corresponding author*

**Abstract:** This paper aims to introduce different environment problems and the method to solve and improve the current situation. There are definitions of green economy, physical water scarcity and economic water scarcity, green building, green bond etc. And comprehensive explanations of what and how to solve the serious natural damages and energy scarcities based on data. Beside of repairing the environment, other means for improvement of green economy system like giving government inventions and popularizing green bond market are also worse to be highly concerned. The energy and resources problems have always been underestimated, especially water resources. Thus, to arise people's attention of this issue and acquaint the seriousness of it is another vital goal. This paper mentioned various fields of data, including map of water scarcity distribution, proportion of water usage in different aspects, data of damage caused by human economic activities, statistical data of Chinese new energy vehicle sale and the comprehensive green bond dataset from 2006 to 2020.

**Keywords:** Water scarcity, green building, government intervention, green bond market

## **1. Introduction**

Expressions like global warming and climate change frequently appear on TV or newspapers. The damages to the environment by human economic activities are easy to see. However, sometime people are still unconscious about the energy shortage, especially water resources and electricity energy. The fact is there are a lot of countries and regions are suffering from it and citizens there pay for the consequence of our underestimation. As a result, the concept of green economy start to be popular and been preferred by many countries. Green Economy, which also called Green Finance, is defined by the United States Environment Program as the economy which promotes human progress and human wealth while using the minimum amount of unrennewable resources and extending the availability of renewable resources [1]. In another word, an economy is defined as green when its low carbon and low gas, at the same time studying and applying and energy-saving technologies and renewable resources like hydraulic electric generator or wind power generator. Building up green economy is becoming a crucial goal for many countries, especially for developed countries and some developing countries because they are the biggest consumers for natural resources in the world. Moreover, the green economy system gets improved with the development of green bond market. In this paper, I will explain how green economy works, what aspects had already been mature and how it improves the green economy in application.

## 2. Water Scarcity

Water resources as one of the largest and the most vital resources, occupying 70.8% proportion of the Earth. Clear drinking water is essential for human's daily life and it is also an indispensable factor for agricultural industries. So people cares not only the quantity of water resources but also quality. It seems like there are unlimited water on the Earth because its area is more than twice of land. However, the fresh water is only about 2.7% while seawater is 97.3% which means water resources is still relatively limited and will run out someday. The difference of scarcity of water could be enormous between different regions, especially for middle east countries, compare with other island countries. This will make the price and value of water extremely unstable. Besides, quality of water started to be considered more because

Water pollution is becoming more and more relevant to our lives, as the pullover of nuclear wastewater by Japan just happened.

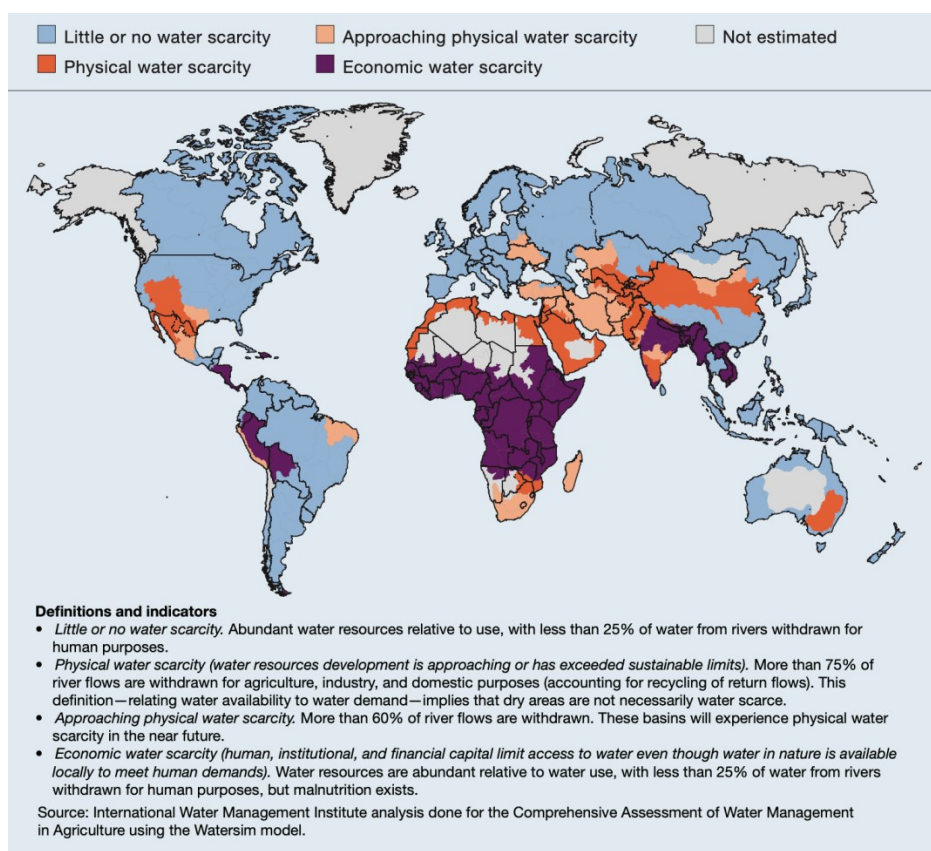


Figure 1: Distribution of different water scarcity (Picture Credit: Molden, 2007) [2]

Although most people in the world do not face the seriousness of water scarcity, there are still some countries and regions suffering the inconvenience brought by physical and economic water scarcity. By definitions, physical water scarcity is the situation that available water resources cannot fulfill aggregate demand of water. Economic water scarcity is defined as the investment on water resources cannot keep pace with the growing demand of water resources [2]. It will cause even more serious physical water scarcity in long run because this is a vicious cycle if there is no other intervention. As shown in Figure 1 above that economic water scarcity widespread in areas like Sub-Saharan Africa, South and Southern East Asia and Southern East of North America, where most countries there are developing or underdeveloped countries. At the same time, physical water scarcity approaching and occurring in Middle Asia, Western Asia, and Northern South America, mainly

because of arid climate. So it is obvious to see that water scarcity is relatively a more serious problem than we expected [3].

In order to prevent water resources from using up, reserve water should be the most primary and easiest way. The first and fundamental is to develop and enhance the awareness of saving water to everyone. People should be clear about the world water capacity and realize the seriousness of current water situation. The government should take more responsibilities on setting up the water-saving concept because it has greater influential power than any individual or organization. Making slogan and advertisement about water-saving to unconsciously influence citizens or enacting laws to punish the individuals and industries who waste or pollute water could be a proper decision for water reservation. Besides of reserving water, another widely used method to save water is through improving efficiency of using water. Water resources, as a sort of energy resources, is frequently used as coolant in power station. As we can see in Figure 2, the water usage per day in the USA in 2015, the largest proportion is for thermoelectric power use, which is used as a coolant, using 133 billion gallons per day. And it is obvious to see that irrigation is the second largest water use aspect with 118 billion gallons per day, which is for agricultural use. Beside of the US., China is another country using enormous amount of water on agriculture. The agricultural water using of China in 2021 was 364.43 billion m<sup>3</sup>, occupies 61.5 of total water usage [4]. Then improve water efficiency on thermoelectric use and agricultural use could largely reduce the expense of water.

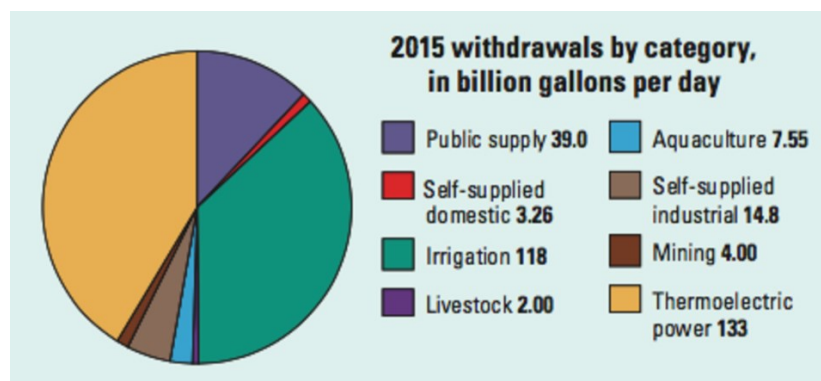


Figure 2: Water usage by category per day in the U.S. (Picture Credit: Public Domain)

### 3. Green Building

Popularizing “green” building or energy-saving building structure is another noticeable green change for the economy. With the rapid growth of world economy, the speed of urbanization process in recent decades had reached the peak in the human history. As the process moving on, more and more land is used for commercial purposes and forests are cleared away for building more skyscraper for various use, especially in developed countries and countries with large population. In recent 15 years, the reduction of forest is more than  $1.048 \times 10^6 \text{ km}^2$ . The consequences caused by land use change is 23% of the world CO<sub>2</sub> emission, 60% of methane emission and 23% of N<sub>2</sub>O emission [5]. As a result, more and more natural disasters like sandstorms, global warming and drought are seriously effecting people’s daily lives. It is self-evident that human activities like land use change bring extreme damage to the Earth ecosystem. Thus, it seems green building structure becomes more necessary.

The definition of green buildings is generally the buildings with low cost of energy or resources, and building including stored building, roads, and all sorts of infrastructures. As we just mentioned before, water resources is vital and necessary for human beings and its scarcity is always being underestimated, so infrastructures which could save water will release water scarcity to some extent. In China, the concept of a new type of city road, called sponge city, which could collect rainwater

was introduced and largely constructed in 2018 [6]. The road possesses characteristics of penetrable and storable. Rainwater could penetrate through the surface of the road and be stored underground. Although rainwater on the ground could get back to water-circle system through evaporation, sponge city could have a better control on water resources.

Carbon dioxide emission is always regarded as the main cause of global warming and process of creating blended cements will emit large amount of CO<sub>2</sub>. To solve this problem, which is to reduce the CO<sub>2</sub> emission, the discovery of natural inorganic materials used to make low carbon cement pave the way to the invention of Portland cement and it brought revolutionary change to construction application at the time of early twentieth century [7]. Beside of using inorganic resources, naturally available resources are “greener”. When the house is constructing, wise ideas of construction could utilize wind power and solar power. Having an opening at south-west side of the house could provide better ventilation. And the position of window could be designed to obtain more naturally available sunlight. Moreover, the solar system had already been mature to replace the old electricity generation method. It saves electricity and save other energies used to make electricity.

#### 4. Government Actions

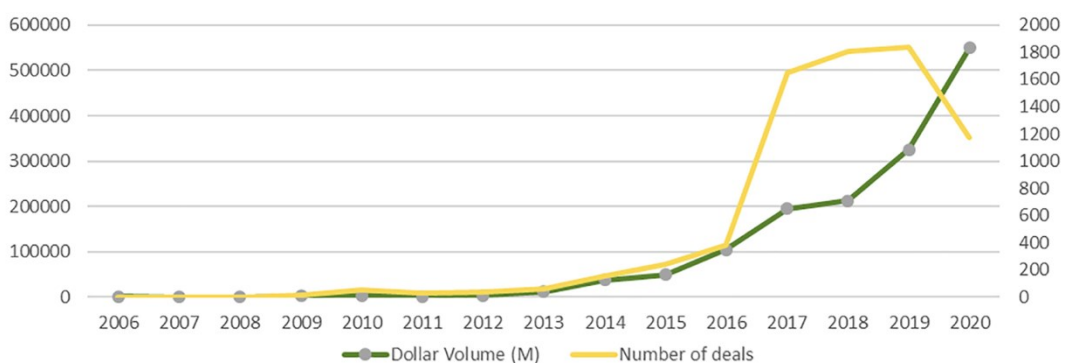
As the development of the society and revolutionary improvement in producing industries in the past decades, it is obvious to see the damages it brought to the natural environment. For instance, “The Smoke” happened in London in 1952 which lead to thousands of death, mainly because the emission of toxic gases emitted by factories mixed with the product of combustion of coal in cold winter. Thus, even the development of industries is significant to economic growth, the behaviors of some companies and factories still bring invariable negative impacts to our human beings. To implement sustainable economic growth, companies should not only be motivated by profits but should also be aware of environmental protection. However, it is hard to develop the awareness by firm owners themselves, so sometimes government inventions could be a convenient tool. For example, enacting limited pollution permissions to firms that frequently emit waste gas. With the permission, firms could only discharge the amount of pollution within the limitation and there should be effective punishment system as long as they exceed the regulated number. Thus, with the regulation by the government, the aggregate amount of pollution could be calculated and controlled. Meanwhile, the limited pollution permission could be tradeable among firms because after this the permission could be allocated to the one need it the most through market economy. The method of government intervention is not only through tax or punishment but could also be subsidies. As the development of electric car, it is becoming a fresh product to the public and popularizing quickly. Governments of many countries will be likely to see the replacement of electric cars to traditional ones. This transfer is profitable to the environment, because it is not need to mention the enormous amount of CO<sub>2</sub> and other toxic gases created by vehicles. Chinese government subsidies consumers who consumer electric vehicles through cut off the purchase tax, which is around 8.5% of the car’s price. Benefit by subsidy of the government, China sold 6.887 million new energy vehicles, up 93.4% year-on-year, accounting for 61.2% of global sales [8]. The outcome of the subsidy is obvious to see and more important is that it is a startup for the popularization of electric cars and another improvement of green economic.

#### 5. Green Bond

When people talking about investment market like bonds or shares, nobody will connect it with green economy and environmental protection. However, as people could invest in various profitable firms, it is the same for companies studying environmentally friendly technology and renewable resources. Green bonds are categorized into four categories [9]:

- (1) Green bonds: the investments are used for new or existed programs which have positive influence on the environment.
- (2) Social bonds: the investments are used for projects bring positive social outcomes, like water safety, vacancy studies, social justices
- (3) Sustainable bonds: the investments are used for a combination of green bonds and social bonds.
- (4) Sustainability-link bonds: structurally linked and progress towards achieving the SDGS will result in reduced or increased interest on the instrument.

The European Investment Bank (EIB) released the first Climate Awareness Bond in 2007, as the first green bond to support renewable energy programs. The following period 2007–2013 is named the “initial stage” of the global green bonds market [9]. Generally speaking, the profit brought by green bond is less than traditional bond because of the lack of space of premium. Then there is no reason for investors to prefer green bonds. However, here are some ideas which could make green bond reasonable. First, not all investors only care about profits, so for environmental protection awareness and long run profit, they will choose to invest in green bonds. Second, green bond could be effective for hedging other bonds with climate risks. It could diversify risks and make bonds with climate risks less risky. Third, green bond has lower return rate than traditional one, it also brings lower risks for investors so it is relatively more profitable in long run, while been contributory to ecosystem. Figure 3 shows the dollar volume and number of deals of green bonds from 2006 to 2020. The increasing trend of green bonds deal started in 2013 and it was relatively flat until 2016, following with an extraordinary rise from 100000 to 500000 in one year. Then it went flatter again and suddenly experienced a drop in 2020, ended with number of 1173. The trend of green bonds dollar volume keeps increasing from 0 in 2013 to 550000 million dollar in 2020. So people’s opinion about investing in green bonds had gradually been accepted and the result of this change will definitely be observed in the future, which is a better living environment and more renewable natural resources. We must therefore look for a leaner, cleaner, more efficient economy which respects environmental limits in delivering maximum wellbeing for all. This moves to green the economy gives us enormous opportunities [10].



Source(s): Authors own work

Figure 3: Dollar volume and Number of deals for Green Bonds between 2006 and 2020 (Picture Credit: Gabr, 2003)[9]

## 6. Conclusion

In today’s society, cities change rapidly, and economic growth is always the priority to many individuals and organizations. But to try seeking for the development system in the long term, green economy would be the direction for humanities’ future. So, the studies and researches for renewable natural resources and improvements and applications for green economic system should have the

same priority with GDP growth. As the paper explained above, the fulfillment of green economy should be based on efforts in various fields and various aspects. The blueprint of green economy just begins, and new explorations are still needed.

## References

- [1] Tongai Wen, Yuxia Ni. (2010) *The Rise Of Green Financial System And Our Country's Countermeasures*, 33
- [2] Molden David, et al. (2007) *Trends in Water and Agricultural Development*. IWMI Books.
- [3] Nairobi, Unep. (2011) *United Nations Environment Programme. Towards a Green Economy : Pathways to Sustainable Development and Poverty Eradication*, 18-21
- [4] *The People's Daily*. Central People's Government of the People's Republic of China. (2023-01-04) *China's new energy vehicle production and sales have ranked first globally for 8 consecutive years*. Retrived from: [https://www.gov.cn/xinwen/2023-01/24/content\\_5738622.htm](https://www.gov.cn/xinwen/2023-01/24/content_5738622.htm)
- [5] Zhou Q, Shi W, Guo Q H. (2021) *The influential mechanism of urban Environmental and Green Infrastructure Investments on Urban High Quality Economic Growth*. *Acta Ecologica Sinica*.
- [6] Yu Kongjian, Li Dihua, Yuan Hong, Fu Wei, Qiao Qing, Wang Sisi. (2015) *Theory and practice of "spongy city"*, 26-27.
- [7] Isha Verma, Prachi Kaustubh Sohoni, Nipun Verma. (2012) *Application of green technology in infrastructure, science*, 150-151.
- [8] Central People's Government of the People's Republic of China. (2022-06-16) *Release of the 2021 China Water Resources Bulletin*. Retrived from: [https://www.gov.cn/xinwen/2022-06/16/content\\_5695973.htm](https://www.gov.cn/xinwen/2022-06/16/content_5695973.htm)
- [9] Dina Hosam Gabr, Mona A.Elbannan. (2023) *Green Finance Insights: evolution if the green bonds market*, 11-13.
- [10] Barbier, Edward B. (2013) *A New Blueprint for a Green Economy*. Routledge.