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ENVIRONMENTAL CONSEQUENCES OF CHINA'S URBANIZATION AND LIFESTYLE CHANGE: ECOLOGICAL AND WATER FOOTPRINTS

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ABSTRACT

China has experienced tremendous economic and social transformations since the open door policy was implemented in 1978, making it one of the world's biggest economies and resource users. The stark disparities in wealth and lifestyles, particularly between urban and rural China, were also a factor in China's economic revival. This paper examines present and future urbanization and lifestyle changes, as well as other significant socioeconomic developments in China. The ramifications of these developments are examined in detail for Beijing, and then contrasted to China in the year 2020. Input–output analysis, as well as the Ecological Footprint and Water Footprint, are used to predict these changes by 2020.

KEYWORDS: *China, Consumption, Ecological, Industrial, Sustainable.*

1. INTRODUCTION

Aside from the conventional environmental issues of industrial air pollution, the sheer volume of resources used by the global economy is now regarded as the overriding danger to planetary health. This is because, despite increased efficiency and improved hazardous material control, human resource demand continues to rise[1]. As a result, maintaining a balance between socioeconomic objectives and environmental sustainability requires not just knowledge of economic resource flows, but also an understanding of how much biological capacity is required to support those flows and absorb waste streams. The current idea of sustainable development is based on determining how a limited world can offer sufficient resources to guarantee the well-being of all people. The Ecological Footprint, in particular, shows that mankind is presently living above the planet's limits.

Rees introduced the idea of Ecological Footprint in 1992 as a measure of the amount of biologically productive [2]land and sea needed to create renewable resources in relation to how a population consumes and assimilates waste using current technologies. The Water Footprint, on the other hand, is a relatively new term that captures the entire quantity of freshwater needed to create the products and services consumed by a person, company, or country. Both indicators point to the possibility that humanity's resource demand exceeds what the planet can sustainably provide, and that this over-consumption is set to accelerate in Asia as a result of rapid economic growth, urbanization, migration, lifestyle changes, and other large-scale social transitions.

China, which covers almost the entire East Asian landmass of approximately 9.6 million km2, about 7% and 6% of the world's arable land and fresh water resources, respectively, and hosts more than 1.3 billion people, or roughly 1/5 of the world's population, is one of the growth engines. In absolute terms, China is endowed with natural resources, but a lack of effective technology and a low per capita availability of resources negate this endowment. Since Deng Xiaoping launched the "Open Door Policy" in 1978, China has seen the world's highest economic development, with an annual GDP growth rate of 9.6%, compared to the global average of 3.3 percent over the same time. China's GDP hit 1.13 trillion US dollars in 2005, placing it in the top four or possibly second biggest economies in terms of purchasing power parity. Deng's ‘ladder-up' economic growth approach, on the other hand, has widened regional income disparities, particularly between more wealthy coastal cities and rural western China, as well as between the southern and northern provinces.

For many Chinese, the most immediate and important consequence of China's economic development is a remarkable increase in their quality of life. These sections of society are no longer content with enough food and clothes, and they want a better existence that includes high-quality food, pleasant living, health care, and progressive adoption of western habits[3]. Simultaneously, China's economic structure is undergoing a steady transition from a mainly agrarian to a rising proportion of industrial and service sectors. By 2003, the secondary and tertiary sectors accounted for about 85% of the national GDP. Despite these advances, many of China's industries remain labor- and resource-intensive .Since 1980, as a result of large-scale industrialization and other significant social developments like as urbanization, the household, municipal, and industrial sectors have begun to compete for resources, hastening the exploitation and depletion of natural resources.

China used to rely far more heavily on what it could manufacture, importing just a few luxury items and rare local resources from other countries. Its economy is no longer limited by the resources accessible inside the nation. Global markets are consumed by urban centers. In reality, China's resource-intensive development path has never seen so many tons of resources enter and leave the country. Important infrastructure and other urban planning choices, on the other hand, require a thorough understanding of alternatives and their environmental consequences. As a result, a thorough knowledge of resource and emission fluxes is a need for China's long-term growth. This study examines current development trends and possibilities for China and one of its main cities, Beijing, until 2020.

Population increase, per capita income growth, urbanization and lifestyle changes, [1]as well as structural economic changes, technological development, and resource efficiency changes, are all examined in the scenarios. The Ecological Footprint (EF) and the Water Footprint (WF) are used to evaluate and quantify the effects of these changes (WF). As a result, the strategy was based on input–output analysis, which was then supplemented by these resource consumption indicators. Scenario analysis has gained a lot of traction as a useful technique for studying large-scale interactions between social, economic, and environmental systems across extended time horizons. The approach offers a logical framework for analysis, allowing for the visualization of the evolution and interaction of the relevant systems as well as the facilitation of debate on the topics of interest.

A framework for evaluating various development pathways or scenarios regarding a society is required in order to compare them. A framework like this is provided by input–output tables supplemented with sustainability indicators. Regardless, input–output analysis has been chastised since the fundamental input–output relationships are represented by fixed coefficients across a certain time period. As a result, the physical structure does not react to price fluctuations automatically. Fixed proportion (Leontief-type) production functions are also assumed in the input–output analysis, implying that input functions are linear. Despite these critiques, input–output analysis provides for discrete and explicit structural modifications, reflecting different scenarios built around each issue to be investigated.

The technology employed in[4] various sectors, the share of the size of various sectors, changes in the composition and breadth of various final demand sectors, and the availability and quality of various environmental resources are all examples of structural changes[5]. Technical literature and specialist knowledge are valuable resources for learning about present and future industrial processes, demographic and other social trends, and environmental issues.

Input–output models may be used to illustrate the connections between income and trade within sectors within an economic area and between regions. These models may also be used as policy tools to examine how the environment interacts with economic and social systems. These technical coefficients aij are considered to be fixed throughout a certain time period. That is, each sector utilizes inputs in fixed proportions, assuming that average spending propensities are equal to marginal expenditure propensities and that production economies of scale are disregarded. An study of the impact of changes in external variables is used to assess economic impacts. Effects on total output (Dx) are computed by multiplying the inverse matrix (I A)1 with the vector (Dy) reflecting changes in final consumption: Dx 14 I A 1Dy (3), where (I A)1 is typically represented as M, the multiplier matrix or Leontief coefficients matrix.

Technical change, or changes in the input–output relationships of economic sectors, is reflected in Matrix M.2.2. Environmental accounting as an extension of the input–output model The interplay of the economy and the environment has been one of the most common applications of input–output analysis in recent decades. However, since there are frequently no market prices and non-linear connections controlling the interactions between economic and ecological systems, the application of input–output analysis to environmental issues seems unexpected at first glance.

Environmental inputs and outputs, on the other hand, may be reconciled using I–O accounting. Over the last several decades, a variety of methods to incorporating the environment have been created. The method used in this article, on the other hand, is based on Leontief's tradition of focusing on the fluxes from the economy to the environment. 'The technical dependency between acceptable and unsatisfactory output levels may be represented in terms of structural coefficients comparable to those used to trace the structural interdependence among all regular branches of production and consumption into the traditional input–output framework.".To link pollution to the activities of each industry, Leontief developed pollution coefficients. This fundamental concept may be expanded to account for any kind of pollution or resource consumption coefficient, and it is used in both of these examples.

2. DISCUSSION

By 2006, the population will have risen to around 1.3 billion. The large proportion of Chinese people in fertile age groups has generated a strong demographic momentum that propels the country forward. Despite already low fertility rates, China's population is growing. China is faced with two opposing trends: while one is positive, the other is negative. Economic development, urbanization, and the resulting lifestyle shift Lower fertility rates, modernization, and the creation of new businesses may all result from this. The government's stringent one-child policy in family planning may face resistance from society. In its most current version (medium variant) The Population Group of the International Institute for Environment and Development (IIED) has made a prediction. According to the Austrian Institute of Applied System Analysis (IIASA), China's in 2020, the world's population will be 1.43 billion, and urbanization will be at a rapid pace. Is expected to be about 50%.

Beijing, according to IIASA projections, will have17.64 million (now 10.86 million, with a 67 percent urbanization rate) With a population of 17.65 million people and a high pace of urbanization, will reach a whopping 88 percent).People's purchasing habits in 1997 were notable because The input–output table is used to determine which households are in the city and which are in the country. Income elasticity's of demand and per capita income for the year 2020 were calculated in 1997.Estimates of per capita income were utilized Changes in technology and structure. Figure 1 discloses the Composition of the Ecological Footprint in China in 2001.

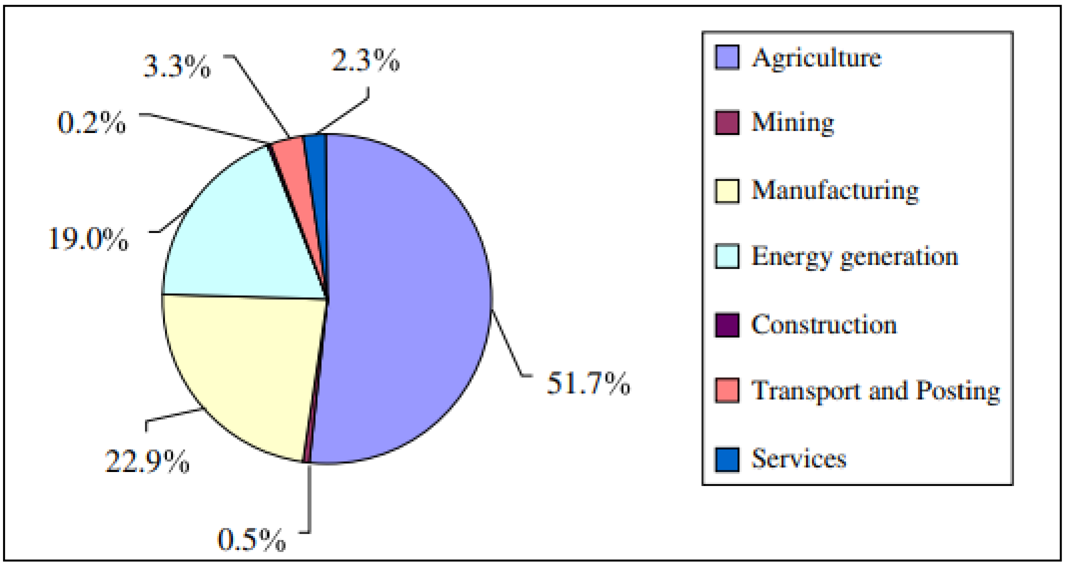

Figure 1: Composition of the Ecological Footprint in China in 2001.

To estimate the Leontief's technical coefficients matrix (A matrix) for 2020, A2020, the RAS method was used. The Royal Astronomical Society (RAS) is a is a commonly used technique for updating an input–output table. During a certain length of time, or to change a national table in order to create a table for each area Miller and his colleagues lay out the fundamentals of the approach. Blair is 27 years old. The base year technology matrix is used in this study. The substitution effect, which is measured by the A1997 14 [aij], then each coefficient all is the degree to which the output of the it sector has been replaced by the output of the it sector.

The fabrication impact; sec total outputs; intermediate production This is determined by the degree to which the intermediate ration the jet sector, the total inputs changed. As a consequence of these two circumstances, in 2020, the technical coefficient matrix may be calculated as follows: 14 brA1997bs A2020 the two diagonal matrices' information, by Estimates of total production in 2020, as well as bus, may be derived.x2020. To get to x2020, we presumptively assumed that the proportion of final the demand-to-total-output ratio in 2020 (y2020) is the same as it was in the previous year.1997 is the starting point. Per unit, certain possibilities for resource usage (EF and WF) of output depending on research available (see the relevant sections) are created (see below).2.4.

In 1997, at a degree of aggregation of 40 by 40 economic sectors, The National Bureau of Statistics of the United States collected and released these statistics. In the year 2000, China was utilized. These tables are broken down per industry. Based on the assumption of sector output homogeneity That is to say, each commodity is produced by just one industry, and each industry produces only one commodity. There is just one product produced by industry. The ‘value-added' categories are those that offer value to a product. Capital depreciation, labor pay, and other items are included in the table. Profits and taxes There are six types of ‘final use':[6] rural fixed consumption, fixed consumption, fixed consumption, fixed consumption, fixed consumption, fixed consumption, fixed consumption, fixed consumption, fixe Investment, inventory changes, and net exports are all factors to consider.

In the meanwhile, the China’s National Bureau of Statistics categorization categories of ‘non-peasants' for city dwellers and ‘peasants' for rural dweller Populations were adopted in a similar way. In the negative numbers, A negative trade balance is shown in the export column. There is an incorrect column. required to keep the table balanced and may be significant in certain case instances. The accounting inaccuracy for industrial transactions, for example, is greater than the figure reflecting net-export of goods. Industrial products As stated in the paper, the National Footprint Accounts (NFA) Manfred et al. And Wackernagel et al. Performed research in the input data for the calculation of EF multipliers pertinent to the Chinese economy is from the year 2004 [30] Network.

According to these findings, the EF for total biological usage isIn 2001, the Chinese economy had 1.78 gha/capita of resources. This The EF may be used for manufacturing, imports, and stock adjustments. Be seen as the entire amount of natural resources needed to create Journal of Cleaner Production 17. Hubacek et al the Chinese economy's overall output, comprising manufacturing in terms of exports This EF was then distributed to 40 different economic sectors. A manufacturing factor need that was later re-allocated Weidman et a research’s was used to perform this analysis. Data on the distribution of EF to industrial sectors from 2006 [20] CO2 emissions and land area built-up were obtained from the National environmental accounting in China. ‘‘China's Regional Water Bullets" was published in 1997, and the ‘‘Regional Water Bullets" was published in 1998.Freshwater consumption is included in the 1999 Statistics Yearbook.

Statistics for both Beijing and China the many types of watesectors Several studies have been conducted. The indication was utilized to make a decision. Because it enhances the knowledge of human behavior, sustainable development is seen as a strong teaching tool. by representing all components of the demand on biological resources as if it were a comparable land (and sea) area. The vast bulk of EF is the unit of measurement in reports is global hectares. a worldwide The yearly productivity of one hectare of land is defined as a hectare (gha). Biologically productive land or sea with world-average production[7]. Large EFs are mostly seen in industrialized nations. Per capita, such as the United States, Australia, and Sweden The footprint of the richest nations is nine times that of the poorest.

The dimensions of the The exchange rate are strongly related to a country's GDP, showing that not all currencies are created equal. Only one nation has been able to fully divorce economic development from population growth. Effect on the environment one of the EF's most powerful messages is showing the effect of trade and emphasizing the need of continuing to do so Countries' economic growth is largely dependent on ecosystems outside of their boundaries. Figure 1 shows an example of a number of nations' EFs showing the importance of Existing disparities Several Chinese Footprint investigations have also been published recently was published. On a per capita basis, China's ecological footprint In contrast to inhabitants of wealthy nations, particularly the United States, is comparatively tiny. Even when measured in absolute terms, the Despite the fact that the US population is less than China's, the US has a larger footprint. China's GDP is less than a quarter of what it is in the United States.

The United States of America and European nations have predicated their economic development on the extraction of natural resources Using few resources, attaining a reasonably good quality of living for a large number of people the vast bulk of their people. However, a significant percentage this work was done at a period when resources were few. Availability[8]. There was a lack of awareness of ecological limitations, and [9]the pressures that came with increasing natural resource use putting life support systems in place Cost of raw materials was cheap, and it failed (and continues to fail) to take into account the real nature of the situation. Production expenses include environmental costs[10].

3. CONCLUSION

Pollution exacerbates water scarcity in North China, particularly in the Beijing area. Guan and Hubacek reported in 2007 that discharged effluent from the economy polluted approximately half of the yearly accessible freshwater resources .The pulp and paper sector was held responsible for the deterioration of the hydro-ecosystem in this case. Since 1996, China has recognized water pollution control as a critical component of the country's overall environmental protection. As a consequence, cleaner manufacturing, especially in the pulp and paper sector in North China, has been encouraged. Many small and medium-sized pulp and paper mills have shut down or switched to more environmentally friendly technologies. Avoiding wet preparations, innovation in the bleaching process, creating a recycling system for alkali liquids in the paper manufacturing process, and other new cleaner production technologies in the paper producing sector may all be implemented.

China's task is to achieve economic development while ensuring that the strain on ecological services does not rise dramatically. This is not the case, according to the situations presented in this article. The evolution of decisions made in the building of new cities and towns is one important topic. Sustainable design may promote a lifestyle with fewer Footprints than the present UK and predicted Beijing levels, as shown by examples of best practice. As a result, China's capacity to build sustainable communities in the future is a major issue.

REFERENCE:

1. C. K. Eaton et al., "The Influence of Environmental Consequences and Internalizing Symptoms on Children's Tic Severity," Child Psychiatry Hum. Dev., 2017.

2. R. Laurenti, J. Singh, R. Sinha, J. Potting, and B. Frostell, "Unintended Environmental Consequences of Improvement Actions: A Qualitative Analysis of Systems' Structure and Behavior," Syst. Res. Behav. Sci., 2016.

3. N. S. Arunraj and J. Maiti, "Development of environmental consequence index (ECI) using fuzzy composite programming," J. Hazard. Mater., 2009.

4. J. P. Hayes et al., "Environmental consequences of intensively managed forest plantations in the Pacific Northwest," J. For., 2005.

5. F. A. L. Pacheco, L. F. Sanches Fernandes, R. F. Valle Junior, C. A. Valera, and T. C. T. Pissarra, "Land degradation: Multiple environmental consequences and routes to neutrality," Current Opinion in Environmental Science and Health. 2018.

6. K. Fichter, "E-commerce: Sorting out the environmental consequences," Journal of Industrial Ecology. 2002.

7. C. Belvederesi, M. S. Thompson, and P. E. Komers, "Statistical analysis of environmental consequences of hazardous liquid pipeline accidents," Heliyon, 2018.

8. R. Banai and T. DePriest, "Urban Sprawl: Definitions, Data, Methods of Measurement, and Environmental Consequences," J. Sustain. Educ., 2014.

9. D. A. Kring, "The Chicxulub impact event and its environmental consequences at the Cretaceous-Tertiary boundary," Palaeogeogr. Palaeoclimatol. Palaeoecol., 2007.

10. S. A. Mukul and J. Herbohn, "The impacts of shifting cultivation on secondary forests dynamics in tropics: A synthesis of the key findings and spatio temporal distribution of research," Environ. Sci. Policy, 2016.