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Original Article

Linkage of Sustainable Agriculture with Quality of Life: A Quantitative Assessment

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Abstract

Agriculture often places a significant strain on the environment and natural resources. Sustainable agriculture aims to maintain and improve soil fertility, protect the environment, and expand the Earth's natural resource base, improving life quality. The principal aim of this research project is to determine a relationship between the advancement of sustainable agriculture and the standard of living, which includes all aspects of an individual's life circumstances, such as natural, social, and economic. Because sustainable agriculture is complex, it must be thoroughly examined. This calls for a rigorous process for a thorough investigation. This required methodically classifying 24 indicators into a subset, which defined specific elements within the environmental (10 indicators), economic (13 indicators), and social (1 indicator) domain dimensions. To check the relationship of all the indicators, trend of all the indicators has been shown after normalization. The results show that there is a harmful impact of degradation in environment's quality on people's heath. The government should organize awareness camps to aware people about use of fertilizers and pesticides. This will promote chemical-free, environmentally friendly agricultural practices that will improve soil health. This will require addressing the weaknesses in technical training, certification, and marketing infrastructure for farmers.

Keywords: *Sustainable agriculture, quality of life, standard of living, environment.*

Introduction

The unique characteristics of agriculture are important in assessing whether the primary goal of any nation's socio economic structure, national security, of which food security is an essential component, can be achieved. Among the many modern theories of socio economic growth, creating a sustainable agricultural sector must be prioritized. Sustainable development's objective is improving life; Quality of Life (QoL) is frequently characterized as the overall well-being of individuals and society. QoL is a multifaceted concept that individuals may evaluate and interpret differently, influenced by age, gender, health status, and cultural considerations. Sustainable agriculture embodies a comprehensive, enduring system intertwined with diverse elements impacting the quality of life. Moreover, it promotes enhancing environmental quality and efficiently utilizing both renewable and non-renewable energy sources. The term 'sustainably underscores the pivotal role of the agricultural sector in augmenting food availability and ensuring food security. This is in accordance with the more general worldwide goals delineated in the Sustainable Development Goals (SDGs) of the United Nations In particular, Goal 2 aims to end hunger, achieve food security, enhance nutrition, and promote sustainable agriculture. SDG 2 acknowledges the connection between access to enough nourishing food and quality of life (QOL), SDG 2 aims to improve the lives and well-being of people and communities by eradicating hunger and securing food supplies. Sufficient nutrition maintains physical health and fosters cognitive growth, educational attainment, and general societal prosperity. SDG 2's focus on sustainable agriculture emphasizes the need to use resources responsibly, protect the environment, and use energy efficiently. These actions support the long-term well-being of current and future generations and are consistent with the multifaceted definition of quality of life. In context to address this, this study aims to analyze the impact of sustainable agriculture on quality of life in the context of SDGs.

Literature Review

The connection between sustainable agriculture and quality of life has been explored by various researchers in terms of rural livelihood (Acharya, 2006), food security (ESCAP, 2009), social capital (Prayitno et al., 2022) and many more (Purvis & Smith, 2013; Shobri et al., 2016; Feher & Beke, 2013). In a study, it has been found that there is a significant correlation between sustainable agriculture and quality of life and between GDP and sustainable agriculture also (Polcyn et al., 2023).

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In another study, results show that in case of farmers' living standards are influenced by social capital (Prayitno et al., 2022).

Data and methodology

Sustainable agriculture addresses three key dimensions environmental, social, and economic. A total of 24 indicators have been employed to gauge these aspects, with 10 focusing on the environment, 13 on the economic front, and I on the social dimension. Data from 2000 to 2020 from world development indicators have been gathered to assess the performance across these indicators. In this study, all indicator values have been normalized to make a comprehensive comparison on a standard scale. Based on computed normalized values of each indicator, line graphs have been generated to show trends over the period.

Normalized value

Here, CV. Current value of the indicator.

Min. Minimum value of indicator and Max Maximum value of indicator.

Results and Policy Suggestions

In this section, the trends of all the indicators are shown in Figure-1-4 Figure I, which depicts the environmental indicators, shows that the methane emission level is almost the same over the period, whereas the emissions level of No2 has increased. Similarly, the use of fertilizers, freshwater withdrawal, water productivity, irrigated land, and forest area have also increased. In contrast, during this period, total agricultural land and arable land decreased, which shows that agricultural land is decreasing because of industrialization and urbanization. From Figures 2-3, it can be seen that over the period, employment in the agriculture sector has decreased, whereas production has increased due to the high use of fertilizers and pesticides. At the same time, irrigation facilities have also improved, which also helped in high production. Lastly. Figure 4 shows that health expenditures have increased. There can be multiple reasons behind that, such as increased levels of NO2, which causes air pollution, and increased use of fertilizers and pesticides, which harm people's health, ultimately leading to high expenditures on health. To control the use of high fertilizers and pesticides, the government should take initiatives to make people aware of their harmful effects. Besides these, the government should encourage people to move from high-water-consuming crops

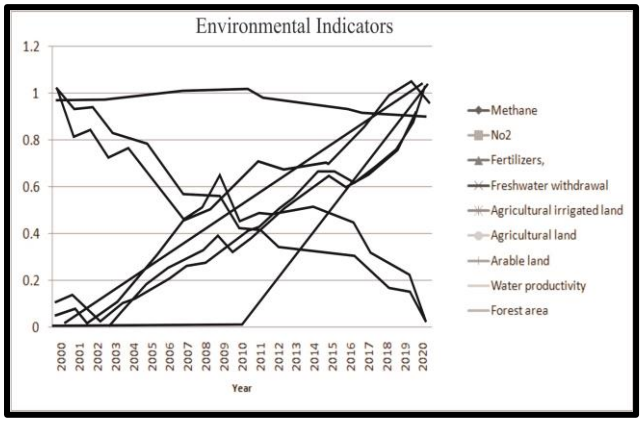

Figure 1: Trend of Environmental Indicators

to low-water-consuming crops, which will also help conserve groundwater. This will also help to reduce the level of methane emissions from agriculture since it is released from paddy fields, which is a highly water-consuming crop.

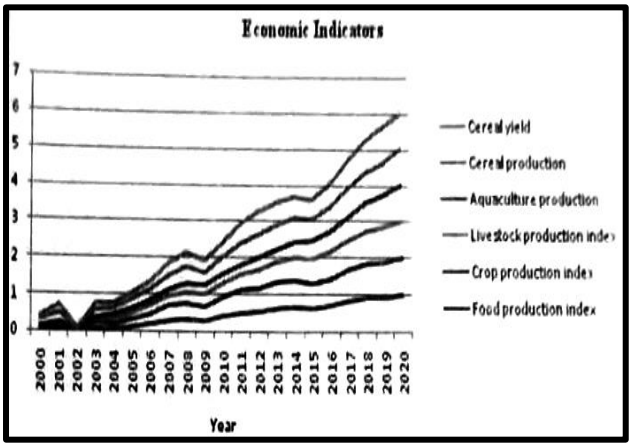

Figure 2: Trend of Economic Indicators

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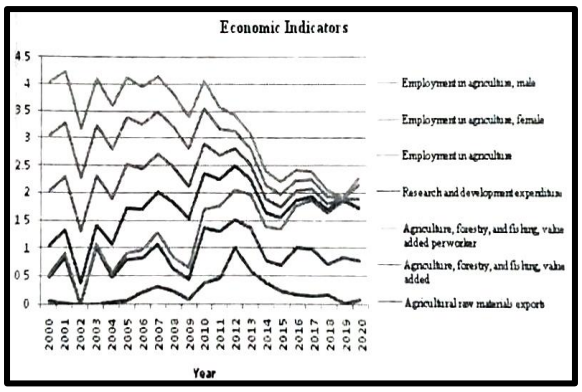

Figure 3: Trend of Economic Indicators

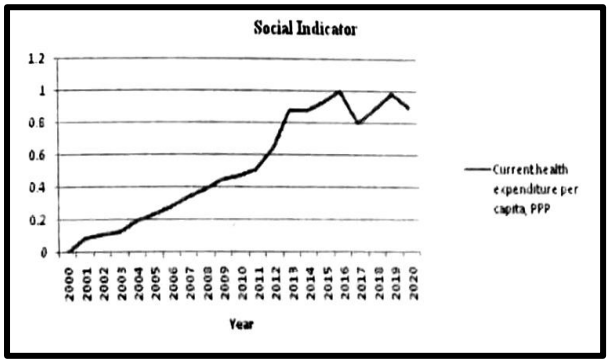

Figure 4: Trend of Social Indicator

Conclusions

This study has compared the various indicators which show the link between quality of life and agriculture. Comparing environmental and economic indicators with social indicators presents a picture of the overall impact of agriculture and the economy on people's health. Results have shown that high emissions levels and increased use of fertilizers harm people's health, ultimately forcing them to spend more on health. Spending more on health because of harmful environmental conditions shows that people's quality of life is not so good. The government should organize awareness camps to make people aware of using fertilizersand pesticides and the optimum use of water resources.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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