

Impacts of Education on Sustainable Development: A Micro Study in Burdwan District of West Bengal, India

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Abstract The present research paper attempts to examine the impacts of education on sustainable development in the district of Burdwan, West Bengal. The study covers two hundred households both in urban and rural areas consisting of 'Below Poverty Line' (BPL) and 'Above Poverty Line' (APL) of Burdwan district in West Bengal. As a statistical method, Chi-square test was used to examine the association between education and sustainable development of the households. The analysis also includes historical evolution and principles of education conducive to sustainable development. A conceptual framework has also been developed to visualize the role of education for achieving sustainable development through a system model. A binary logit regression model has been used to determine the extent of relationship between education and sustainable development by a set of selected indicators. Again, students't-test has been applied to examine the hypotheses whether any variation about the impact of sustainable development in terms of education among the households (i.e., rural and urban or APL and BPL families) exists or not. Finally, it has been concluded that education have had a significant positive impact on the sustainable development of households of Burdwan district in West Bengal.

Keywords: Education, awareness, Education community, decision making, status of women, binary logit model, sustainable development

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1. Introduction

Education is an essential tool for achieving sustainability. People around the world recognize that current economic development trends are not sustainable and that public awareness, education, and training are key to moving society toward sustainability. People argue about the meaning of sustainable development and whether or not it is attainable. They have different views of what sustainable societies will look like and how they will function. People wonder why educators have not moved more quickly to develop education for sustainability programs. However, UNESCO [10] declares that education is a human right and the primary agent of transformation towards sustainable development by increasing people's capacities to transform their visions for society into reality.

Sustainable development is a complex concept. It is also continually evolving, which makes it difficult to define. One of the original descriptions of sustainable development is credited to the Brundtland Commission; "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p 43). Sustainable development is generally thought to have three components; environment, society, and economy.

The well-being of these three areas is entangled, not separate. For example, a healthy, prosperous society relies on a healthy environment to provide food and resources, safe drinking water, and clean air for its citizens. The sustainability paradigm rejects the contention that casualties in the environmental and social realms are inevitable and acceptable consequences of economic development. Thus, sustainability is treated as a paradigm for thinking about a future in which environmental, societal, and economic considerations are balanced in the pursuit of development and improved quality of life [1]. An important distinction is the difference between education *about* sustainable development and education *for* sustainable development. The first is an awareness lesson or theoretical discussion. The second is the use of education as a tool to achieve sustainability. Various studies were conducted to evaluate the role of education on sustainable development but no comprehensive study has yet been done on both the concepts. The present study is intended to bridge the gaps of knowledge in this area [1,2,3,7,8].

2. Objectives

Following objectives are laid down for the study:

- i) To analyze the history and principles of sustainable development.
- ii) To assess the importance of education on sustainable development.

- iii) To examine the degree of association between education and sustainable development of the studied households.
- iv) To analyze the factors responsible for sustainable development and interlinked with education.
- v) To study the nature of about sustainable development of the households belongs to BPL (Below Poverty Line) and APL (Above Poverty Line) categories through education.
- vi) To assess the attitude and understanding about sustainable development of the people belong to rural and urban areas and its relation with their level of education.

3. Null Hypotheses

H₀₁: There is no true gender difference in the opinion about education and sustainable development.

H₀₂: The impacts of education and sustainable development on rural and urban households do not differ significantly.

H₀₃: The discrepancies between the APL and BPL households about the impacts of education on sustainable development do not differ significantly.

4. Data Source and Methodology

The study is mainly empirical in nature. Data to satisfy the objectives of the study were collected from 200 households both in urban and rural areas out of which 100 belongs to APL and another 100 households belongs to BPL categories in Burdwan district of West Bengal during 2013-14.. A self made structured questionnaire was used by considering different kinds of factors associated with socio-economic sustainable development. The following factors have been selected to analyze the effects of education on sustainable development:

- i) Per capita income (PCI)
- ii) Status of women (ESW)
- iii) Population growth (RPW)
- iv) Standard of living (RSL)
- v) Awareness about environment protection (EEP)
- vi) Decision making (DM)

A system model (in terms of flow chart) and binary logit regression have been used in order to analyze the effect of the above selected factors on sustainable development [2].

Table 1. Selected variables explaining the sustainable quality of life among the respondents

Sl. No.	Variables	Explanation
1	Higher per capita income	It can be described as indicator of economic development on a sustained basis.
2	Enhancement status of women	It can be explained as proxy variable of rising status and position of women within the households and in the society.
3	Reduction of population growth	It can be used as a proxy variable of growing attitude and consciousness about control of rate of growth of population.
4	Raise standard of living	It can be treated as a proxy variable about the enhancement of quality in life through the change in consumption pattern.
5	Enhancement awareness about environment protection	It can be described as proxy variable to organise and participation of people to protect environment.
6.	Power of decision making	It can be explained as proxy variable of enhancement of decision making power of educated members of households in day-to-day life.

5. Analysis and Discussion

Analysis of data was made with a view to the following issues:

1. Principles and History of sustainable development
2. Impact of Education on Sustainable Development: A Conceptual Framework.
3. Education and Sustainable socio-economic Development: A Non-parametric Chi-square Test.
4. Education and Sustainable socio-economic Development: A Binary Logit Model
5. Attitude and awareness of households about sustainable development through education consisting of rural and urban areas belong to APL and BPL classes: An Analysis in terms of Students t test.

5.1. Principles and History of Education for Sustainable Development

Many governments and individuals have pondered what sustainable development means beyond a simple one-sentence definition. The *Rio Declaration on Environment and Development* fleshes out the definition by listing the following principles of sustainability [3].

- People are entitled to a healthy and productive life in harmony with nature.

- Development today must not undermine the development and environment needs of present and future generations.
- Nations have the sovereign right to take advantage of their own resources, but without causing environmental damage beyond their borders.
- Nations shall develop international laws to provide reimbursement for damage that activities under their control cause to areas beyond their borders.
- Nations shall use the preventive approach to protect the environment. Where there are threats of serious or irreversible damage, scientific uncertainty shall not be used to postpone cost-effective measures to prevent environmental degradation.
- Nations should reduce and eradicate unsustainable patterns of production and consumption, and promote appropriate demographic policies.
- Environmental issues are best handled with the participation of all concerned citizens. Nations shall enact effective environmental laws, and develop national law regarding liability for the fatalities of pollution and other environmental damage. The polluter should, in principle, bear the cost of pollution.
- Environmental protection shall comprise an integral part of the development process, and

cannot be considered in isolation from it. Eradicating poverty and reducing disparities in living standards in different parts of the world are essential to achieve sustainable development and meet the needs of the majority of people.

History of Education for Sustainable Development

Sustainable development was first endorsed at the UN General Assembly in 1987, the parallel concept of education to support sustainable development has also been explored. From 1987 to 1992, the concept of sustainable development established as committees discussed, negotiated, and wrote the 40 chapters of *Agenda 21*. Initial thoughts with reference to education and sustainable development (ESD) were captured in Chapter 36 of *Agenda 21*, "Promoting Education, Public Awareness, and Training."

Unlike most education movements, ESD was initiated by people outside of the education community. In fact, one major push for ESD came from international political and economic forums (e.g., United Nations, Organization for Economic Co-operation and Development, Organization of American States). As the concept of sustainable

development was discussed and formulated, it became perceptible that education is key factor to sustainability. In many countries, ESD is still being shaped by those outside the education community. The concepts and content of ESD in these cases are developed by ministries, such as those of environment and health, and then given to educators to deliver. Conceptual development independent of educator input is a problem accepted by international bodies as well as educators [7].

5.2. Analysis Pertaining to Environmental Education and Sustainable Development

The present study was conducted to make an assessment of perceptions of the guardians and women members of the households about the role of education in achieving sustainable development in terms of non-parametric 'Chi-square' analysis. The opinions of the respondents collected from the field survey have been expressed in the following table.

Table 2. Opinions of the respondents about association between education and sustainable development (ESD) selected for the present study

Respondents	Yes	Uncertain	No	Total	value of χ^2	Level of significance
Men	70	20	10	100	3.98	0.05
Women	80	10	10	100		
Total	150	30	20	200		

Source: Field Survey, 2013-14.

The calculated value and the observed value of 'Chi-square' are exposed in the table below (vide Table 2).

It evident from the table - 3 that the observed value of Chi-square (χ^2) i.e., 3.98 is not significant at 0.05 % level. Therefore the null hypothesis is accepted. So, there is no true gender difference in the opinion about education and sustainable development. During field survey, it was revealed that most of the members irrespective of gender variation are aware of education and its ultimate effect on socio-economic development in a sustainable manner.

5.3. Importance of Education on Sustainable Development: A Conceptual Framework

The term sustainable development is a multi-dimensional concept. The relationship between education and sustainable development can be explained in terms of a system model through the several quantitative as well as qualitative indicators.

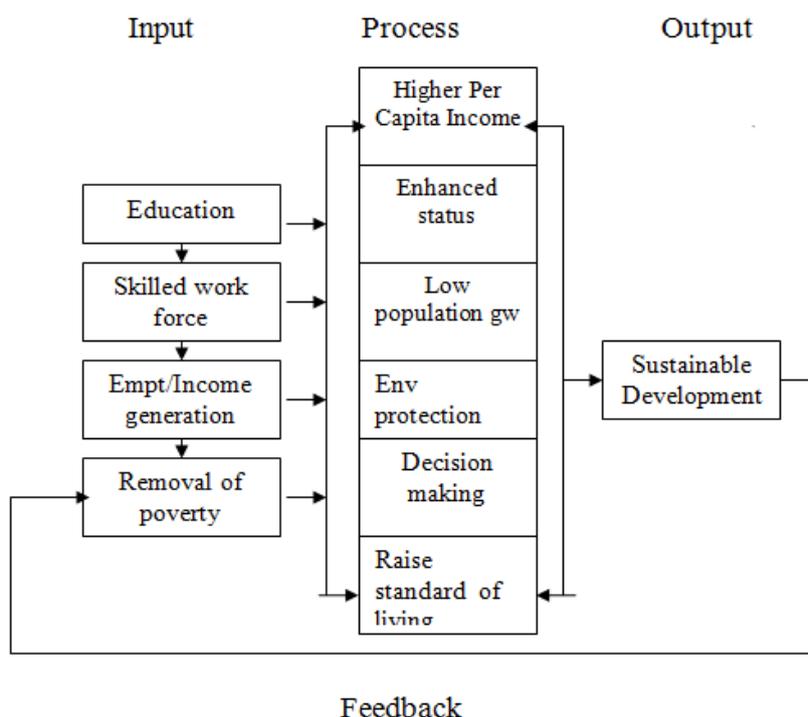


Figure 1. Education and Sustainable Development: A Conceptual Framework

Figure 1 above depicts the hypothesized benefit process of education, reflecting intermediate and ultimate impact goals. The inputs of education channel through promotion of skilled work force, employment/income generation and removal of poverty which have the potential to produce intermediate or first order effects that include higher per capita income (PCI), enhancement of status especially of women members in the family, controlled population growth, conservation of environment, power of decision making, raise standard of living etc. These first order

effects provide the potential for the second order and ultimate effects on sustainable development [8].

5.4. Education and Sustainable socio-economic Development: A Binary Logit Model

The impact of education on sustainable development of the households can be explained in terms of a binary logit regression model with the help of a set of selected indicators influencing development.

Table 3. Logit analysis explaining sustainable development through education

QL = C ₀ + C ₁ *PCI + C ₂ * ESW + C ₃ *RPW + C ₄ *EEP + C ₅ *RSL+ C ₆ *PDM				
Variable	Coefficient	Std. Error	Z-Stat	Prob.
C	-14.32142	2.213451	-6.521344	0.0000
Higher Per Capita Income (PCI)	0.001423	0.000247	4.425361	0.0000
Enhance the status of women (ESW)	4.428124	0.699321	6.328254	0.0000
Reduce population growth rates(RPW)	0.241029	0.641950	0.354712	0.6210
Enhance environmental protection (EEP)	0.297816	0.697812	0.374513	0.6832
Raise the standard of living (RSL)	1.287241	0.286542	4.492352	0.0000
Power of decision making (PDM)	1.789122	0.378516	5.742516	0.2145
Mean dependent var	0.832145	SD dependent var		0.373241
S.E. of regression	0.146125	Akaike info criterion		0.169354
Sum squared resid	12.91254	Schwarz criterion		0.212546
Log Likelihood	-45.24516	Hannan-Quinn criter		0.182845
Restr. Log likelihood	-276.45	Avg. log likelihood		-0.25174
LR statistic(5df)	457.23	McFaddenR- squared		0.789614
Probability (LR stat)	0.000000	-		-

Source: Author's calculation based on field survey, 2013-14
 Dependent Variable = Sustainable Development
 Total number of observations = 200.

It is clear from the results (vide Table 3) that the higher per capita income has been found to be positively associated with sustainable development which is highly significant. This implies that the higher the level of education, the higher will be the level of development through enhancing higher level of per head income of the members with in the households. Again the two factors-enhancement status of women and raise standard of living are also seen to be positively related to development and highly significant. Although the coefficient of the explanatory variables affecting development i.e., reduction of population growth, environment protection and power of decision making are found to be positive but it suffers the problem of insignificance. This indicates a question mark about consciousness of the families on sustainable development in the study area. This suggests one important view that in order to enhance the sustainability

of development of the households, awareness about modern outlook and peaceful life must be ensured [9].

5.5. Attitude and Consciousness of Households about Sustainable Development through Education Consisting in Rural and Urban Areas as well as in APL and BPL classes: An Analysis in Terms of Students t Test

Environmental education has had a positive impact on sustainable development of the surveyed households. But there exists significant variation of impact of education on sustainability of development according to status and locality of households. This can be expressed in terms of the calculated values of students't-test.

Table 4. Attitudes of households about the awareness of sustainable development through education in terms of calculated values of mean, S.D. and t

Type of Households	N	Mean	S.D.	't' Value	Level of significance
Urban	80	28.31	5.02	2.67	0.01
Rural	120	21.45	3.24		

Source: Author's calculation based on field survey, 2013-14.

Table 4 indicates that the calculated value of t is greater than the critical values both at 5 % and 1 % level of significance. Therefore, the null hypothesis is rejected indicating that there exists significant variation of awareness among the studied households about the impact of education on sustainable development. During field survey, it has been observed that most of the rural

households are not aware of the modernity and better quality of life in spite of their enhancement of per capita of income through the upliftment of education. Moreover the schools in rural areas of this district are not well equipped in terms of infrastructural facilities. This finding suggests the view of the study of Mondal, Paul and Baskey [4].

Table 5. Attitudes of surveyed households about the awareness of sustainable development with the help of education in terms of calculated values of mean, S.D. and t

Status of Households	N	Mean	S.D.	't' Value	Level of significance
APL	100	27.25	5.34	2.89	0.01
BPL	100	21.14	4.23		

Source: Author's calculation based on field survey, 2013-14.

Table 5 indicates that the calculated value of t is larger than the critical values at 1 % level of significance. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted indicating that there exists significant variation of awareness among the households about the impact of education on development. During field survey, it has been observed that most of the studied BPL families (i.e., households living below the poverty line) in Burdwan district are ignorant about the concept of sustainable development although they are advancing in education day by day. This means that the rural BPL classes' households are not in close touch of information and communication technologies (i.e., ICTs) to acquire of modern amenities of development. Again this finding is consistent with the study of Paul and Mondal [5] Nandi and Paul [6].

6. Conclusion and Suggestions

6.1. Conclusion

This paper of research highlights the role of education affecting degree of sustainable development among the households of Burdwan district, West Bengal. The result revealed a positive association between education and sustainable development irrespective of sex, areas (i.e., urban or rural) and categories (i.e., APL or BPL). The results further indicated that there has been significant positive influence on sustainable development with reference to the factors – higher per capita income (PCI), enhancement of status of women, reducing population growth rate, enhancing environment protection, raise standard of living and power of decision making. However, there exists some variation regarding the degree of sustainability of development through the education among the households belongs to different socio-economic status (APL and BPL households) and localities (urban and rural).

6.2. Concluding Remarks

The policy suggestions that can be made to enhance the effective role of education in sustainable development as follows:

- Nations shall caution one another of natural disasters or activities that may have harmful impacts on sustainable development.
- Sustainable development requires better scientific understanding of the problems. Nations should

share knowledge and innovative technologies to achieve the goal of sustainability.

- The full participation of women is essential to achieve sustainable development. The creativity, ideals and courage of youth and the knowledge of indigenous people are needed too. Nations should be familiar with and support the identity, culture and interests of native people.
- Warfare is inherently unhelpful of sustainable development, and Nations shall respect international laws protecting the environment in times of armed conflict, and shall collaborate in their further establishment.
- Peace, development and environmental protection are mutually supporting and indivisible.

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