Household Characteristics and Higher Education Role in Creating Sustainable Development, In the Future

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ARTICLE DETAILS

ABSTRACT

The present study has been designed to examine household characteristics and higher education’s role in creating sustainable development in the future in Southern Punjab, Pakistan. It indicates the sustainability in education based upon core knowledge and scientific methods that are used to increase the interest of households toward economic growth. Household higher education for sustainable development (HESD) is a good method but it is affected by different social and economic factors. Primary data was collected from 200 respondents from urban households. Data on the household higher education was collected by the respondent by asking a series of questions. For data estimation ordered logistic regression was used. The final findings of our study concluded that age, income, and covid vaccine19 have positive coefficients and which indicates a household’s higher level of education has a positive impact on sustainable development for creating sustainability in the future, and household family size and landholding have a negative coefficient. Measuring sustainability and the economic progress of household characteristics through higher education is the best way and it indicates a good standard of household lifestyles. Proper policies should be implemented that increase the interest of the government to increase funding for educational institutions at the province level in creating sustainable development in the future in southern Punjab Pakistan.

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1. Introduction

Education is an important pathway to sustainable development. It is an important tool for social problem solving. For long term, economic development higher education is a key that boosts
the human capital of the individual. It provides two kinds of growth one type that accelerates scientific and technological progress and another type that focuses on the method of learning to understand the above techniques (Badea et al., 2020; Leal Filho, 2015). The lower enrollment ratio in developing countries created many problems in developing sustainability as compared to developed countries. In developed countries, the enrolment ratio is higher and mostly human capital is involved in economic development (Ozawa et al., 2022; Shafiq et al., 2019).

In poor countries, the use of technological techniques is very lower new methods are not used that increase labor skills so poor use of technology creates many problems. To develop a country's progress or solve problems at the national level higher education has played a crucial role in developing sustainability. Resources devoted to research and development increase income shares that accelerate development, and sustainability that will increase higher education and enrollment ratio in poor developing areas of Pakistan. So the advancement of higher education increases the intellectual of individuals that extend the use of technological services for development sustainability in the future (Ozawa et al., 2022; Shafiq et al., 2019; Leal Filho, 2015).

In developed countries government is more focused to devoted resources to research and development is the best way that increases national income shares or standard of living but in poor developing countries lower resources are devoted to research and development and the government showed lower interest to take new technologies that accelerate development sustainability because mostly poor regions have lack of higher education and enrolment rate. So higher education development and sustainability is a crucial factor that increases economic development (Badea et al., 2020; Pirosca et al., 2020).

Creating a national innovation system for research and development that endogenous technological progress is a big challenge for every country's development, but through higher education, it's all possible easy way. Higher education is a major engine of problem solving in poor developing countries, so in future challenges of sustainable development that more focus on adaptations of advanced technology that increase economic productivity and lower dependence on physical environment that decrease economic productivity that all possible through higher education (Shafiq et al., 2019; Sterling, 2004).

Modern economic growth is a good way that pace development, and sustainability in this complicated world which is all easily achievable through higher education. Higher education builds local communities that help poor countries to solve problems. It developed human skills and different techniques that are knowledge based and that all are very helpful to maintain development, and sustainability in upcoming years in that way we will increase development, and sustainability in poor areas of Pakistan so that all possible through higher education to meet the capabilities of economic development (Badea et al., 2020; Pirosca et al., 2020).

Through higher education, in poor countries, farmers adopted different production techniques that will increase the average income of every farmer will increase poor living standards because, in backward countries, most farmers are attached to the traditional method of farming that played very minor roles to increase the productivity of land farmer so higher education is a good way to increase per acre productivity of land farmer (Draghici, 2019; Komives et al., 2019; Lacharite, 2016)
An increase in higher education and enrolment rate in poor areas will solve farmer, and agricultural problems in a good way. Modern agricultural methods with less use of physical effort and more used of machines will increase the knowledge base technological skills and development sustainability. So increasing the higher education and enrollment rate is an effective method that will efficiently solve the problems of farmers (Komives et al., 2019; Leal Filho, 2015; Alam et al., 2009).

Liberal or practical education is the best way to increase industrial growth so through industrial growth, economic development, sustainability is more stable and long term growth effects meet not level effects comes. The Government gives more focus to increasing investment activities in education, and institutions to increase the ratio of higher education, but in a poor community's government does not take an interest to increase the enrolment rate which is the main reason for lower development sustainability in backward regions (Giannetti et al., 2021; Badea et al., 2020; Pirosca et al., 2020; Draghici, 2019). So, the study will explore the various factors that affect the households' higher level of education in creating sustainable development in the future in southern Punjab Pakistan.

2. Literature Review

Wals and Jickling (2002) examined the role of higher education in developing sustainability in many educational institutions in Canada or the Netherlands. Sustainability in education indicates that core knowledge and scientific methods are used that increase the interest of students toward economic growth and prefer those production techniques that bring no damage or negative effects on the environment. This study showed that educational institutions give more focus on different programs or technical courses that increased the interest of economies toward development sustainability. So, the study belonging on the role of higher education in the development of sustainability indicates more efforts are needed that increase interest in sustainability and lower interest in sustainability brings many problems in the upcoming year.

Calder and Richard Clugston (2003) analyzed the international efforts to promote higher education for development sustainability in Johannesburg. This study used a concept of higher education that explained how the environment is protected from pollution because the old methods of production not used resources efficiently, but with core knowledge and values base technical techniques used resources efficiently or protect economic resources and preserve the environment for the future generation. This study used qualitative based research that indicated with time more used technology and less used physical environment are possible only through higher education. The final result of the study indicated that the government is only concerned to increase business activities as the best way to increase development, sustainability but in most countries like the Philippines, Holland and in Tanzania more concerned with the education that increases development, sustainability, or take proper policies to preserve the economy from environmental pollution. So, this study suggests some important policy implications that increase households' interest in higher education and increase development sustainability in the future.

Velazquez et al. (2005) investigated different factors that affect higher education institutions for development and sustainability. For data analysis, different department reports, and website published and unpublished papers have been selected from Mexico university. The time frame of this paper included a literature review from 1990 to 2002. This study examined different factors that influence sustainability programs like lack of funding and interest, internship training or poor access to data and many technical problems that decreased the development sustainability process in many
institutions. The final findings of the paper indicated that government does not take an interest to implement proper policies or programs to increase sustainability stability and has little focus to improved sustainable development goals at the university level. Moreover, the government does not pay higher wages to teachers that have more experience. Proper policies should be made to increase the awareness and interest of the government to increase funding rates in higher education institutions. So the current study explores different factors that influence household higher education's role in developing sustainability.

Garcia et al. (2006) examined sustainability in higher education. This paper analyzed that some educational institutions focused more to increase development, and sustainability but some institutions have lower concerns to increase development and sustainability. This study used a qualitative method to understand sustainability in higher education. The result showed that education played an important role in households' higher education and sustainable development in some countries more focus on research and development to get growth level effects but in some poor countries lower focus on research that brings temporary development not long term effects of development.

Sibbel (2009) analyzed different pathways that increase awareness of development sustainability through higher education in Australia. This study showed that through sustainability, the basic knowledge of workers increased and they used advanced level policies that did not create air pollution and used economically friendly policies to protect the environment or limited resources of the economy. The final results of the study showed that the government offered special funds that increased the salary of those workers that have more experience as compared to those professional persons that have lower experience because experienced staff brings a positive impact on those workers that lack knowledge toward the adaptation of useful productive techniques. So, the present study implements proper policies that should be made to increase households' awareness of higher education.

Draghici (2019) examined the impact of vocational institutions' knowledge and skills in Romina. The study showed that many professional officers extend their skills and knowledge through training programs offered by vocational institutions. Two international training programs are taken for data analysis and assistance is given in these vocational institutes by the international funding system. The final result of the study showed that training programs offered by the international funding system in roman economies bring a positive impact on development and sustainability in the future. So, the current study identifies different household social economic factors that affect higher education in creating sustainability in the future.

Badea et al. (2020) examined the long lasting impact of education on development and sustainability in Rome. And to check the positive impact of education for development sustainability on business management policies that represent the rational behavior of students toward economic development. Primary data have been used for data analysis. The sample size is twelve hundred and fifty three which was taken from roman university Bucharest for economic analysis. The result of the study indicated that universities increase the interest of students toward development, sustainability through education brings a positive impact on business management policies and in that way economic development, improved and that is good for better lifestyles of households and economies. The past study of this scenario about higher education for sustainable development will bring some gaps and turn this scenario into a new pathway to increase the interest of families toward the higher
education role in creating sustainable development in the future in southern Punjab Pakistan.

3. Data and Methodology

3.1 Research Design

For seeking information from the respondents' primary data have been collected from Vehari District. Information about household characteristics like the age of the respondent, the monthly income of the household, higher education, total family size, respondent land holding and the covid vaccine was also collected.

3.2 Sample Subset and Simple Random Technique

The study used the multistage simple random technique. In 1st step, of data collection, Tehsil Vehari was selected. In the 2nd step, five colonies were randomly chosen from urban areas, respectively. In the third stage, 40 individuals were chosen randomly from every colony. So, the total sample subset was 200 individuals from urban areas.

3.3 Collection of Data

Data have been collected by the respondent by asking a series of questions like the age of the respondent, the monthly income of the household, higher education, total family size, respondent land holding and the covid vaccine was also collected. Measuring sustainability and the economic progress of household social change through higher education is the best way and it indicates a good standard of household lifestyles.

3.4 Description Variables

This section explains the description of variables.

3.4.1 Dependent Variable

3.4.1.1 Level of Higher Education for Sustainable Development (HESD)

In our paper, the dependent variable is HESD which includes the primary, secondary, and tertiary levels of education. It was taken in the number of schooling years. When knowing the level of higher education of the respondent at the time of data collection.

3.4.2 HESD Classification

Following is the classification of the HESD for each household head.

Table 1: HESD Classification

<table>
<thead>
<tr>
<th>HESD</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1=(1-5)</td>
<td>Primary level (lower)</td>
</tr>
<tr>
<td>2=(6-12)</td>
<td>Secondary level (medium)</td>
</tr>
<tr>
<td>3=(Above 12)</td>
<td>Tertiary level (higher)</td>
</tr>
</tbody>
</table>

3.4.3 Independent Variables

3.4.3.1 Age of the Household Head

One or more people living in a joint family system is called a household. The age of the household head was recorded in the number of years at the time of data collection.

3.4.3.2 Household Family Size

Household family size represents the total number of persons that are living together in one house. A large family size represents the lower level of schooling year.
3.4.3.3 Income of the Household Head
Earning income shows the total incomes that are earned by all household members from all sources. The income of the household head has been taken in Pakistani rupees in the data.

3.4.3.4 Agriculture Land Holding
In this paper, the land holding was taken in dummy form if owned than one otherwise zero. it represents the positive relationship between per capita income and HESD.

3.4.3.5 Covid Vaccine-19
In this study, the covid vaccine was taken in dummy form if yes then one otherwise zero. it represents the positive relationship with HESD.

3.5 Econometric Model
OLRM was used for data analysis. Measuring sustainability and the economic progress of household characteristics through the higher education logistic regression method is the best way for data analysis (Shafiq et al. 2019; Branden, 2013).

3.5.1 Estimation of Ordered Logistic Model
The general form of OLRM

\[ Y_i = B_1 W_{i1} + B_2 W_{i2} + B_3 W_{i3} + \ldots B_k W_{ik} + e \ldots \ldots (a) \]

Where
- \( Y_i \) = dependent variable
- \( W_i \) = Predictor variable
- \( e \) = white noise
- \( i \) = number of observations 1,......k

Further, we assumed that our n regressors were in j –ordered alternatives or in odd ratio form.

\[ Y_i = 1(1-5), \text{if } Y_i \leq a_1 \]
\[ Y_i = 2(6-12), \text{if } a_1 \leq Y_i \leq a_2 \]
\[ Y_i = 3, (above..12), \text{if } a_2 \leq Y_i \leq a_3 \]
\[ \vdots \]
\[ Y_i = J, \text{if } a_{j-1} \leq Y_i \leq Y_j \ldots \ldots (b) \]

where \( a_1 < a_2 < a_3 \ldots < a_{j-1} \)

\( Y_i=j \) is our classification and in this study, our classification is three. Every level of education is greater than the previous level of education. So, the above twelve level of education is greater than the previous one.

4. Empirical Results
Results and explanation of various variables that are used in the models showed in this section. Descriptive statistics are present in 4.1. And the result of the correlation matrix and OLRM results are presented in two parts 4.2 and 4.3.
4.1 Descriptive Analysis
Table 2 presents the descriptive analysis of all variables that are used in OLRM.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Y) HESD</td>
<td>2.46</td>
<td>0.664</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>(W1) Age</td>
<td>31.945</td>
<td>6.168</td>
<td>20</td>
<td>43</td>
</tr>
<tr>
<td>(W2) Size</td>
<td>4.115</td>
<td>1.521</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>(W3) Income</td>
<td>4.005</td>
<td>1.132</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>(W4) Landholding</td>
<td>0.645</td>
<td>0.48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>(W5) Covidvac19</td>
<td>0.89</td>
<td>0.314</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2 presents the description of the statistics and the mean value of the Y order (HESD) and its value is 2.46, the lower value of the Y order (HESD) is one & higher is three. The mean value of W1,31.95 with the least number considered twenty and the higher number ranging forty-three. Same as the W2 value of the mean is 1.521 with the least number one and higher number range of five. W3 mean range is 4.005 least number one and the higher number five. The W4 and W5 values of the mean are 0.645 & 0.89 respectively, the lowest and the highest values of both are zero and one.

4.2 Correlation Matrix
Table 3 explains the variable matrix relationship of all variables that are used in OLRM.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Y</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y(HESD)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W1</td>
<td>0.733</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W2</td>
<td>-0.769</td>
<td>-0.675</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W3</td>
<td>0.853</td>
<td>0.564</td>
<td>-0.712</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W4</td>
<td>-0.321</td>
<td>-0.258</td>
<td>0.208</td>
<td>-0.191</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>W5</td>
<td>0.630</td>
<td>0.381</td>
<td>-0.310</td>
<td>0.624</td>
<td>-0.227</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The table indicates a correlation between Y (HESD) and its value is one. The relationship of Y (HESD) & W1 is positive that indicated - a unit increase in W1 is associated with an increase in Y order (HESD). W2 and W4 are correlated with y negatively. The values of the correlation coefficient lie between positive to negative. Positive values indicate a positive relationship and negative values indicate a negative relationship with the dependent variable and zero value indicates no relationship with the dependent variable. But the value of W3 and W5 indicates a positive relationship a one-unit increase in W3 and W5 is associated with an increase in Y order (HESD).

4.2 HESD in Y Order Category
HESD is classified into 3 parts primary, secondary and tertiary levels of education. Figure 4.2 indicates the HESD. The lower primary order category is 9.5%, the secondary or middle level is 3.5% and the higher or tertiary level is 55.5%.
4.3 The Analysis of Ordered logistic Regression

Different factors influence household characteristics and the role of higher education in creating sustainable development in the future. Regression results for HESD in southern Punjab, Pakistan showed in table 4.

Table 4: The Model of Ordered logistic Regression

<table>
<thead>
<tr>
<th>Y Ordre (HESD)</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>0.510***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
</tr>
<tr>
<td>W2</td>
<td>-1.306***</td>
</tr>
<tr>
<td></td>
<td>(0.410)</td>
</tr>
<tr>
<td>W3</td>
<td>3.473***</td>
</tr>
<tr>
<td></td>
<td>(0.796)</td>
</tr>
<tr>
<td>W4</td>
<td>-2.205**</td>
</tr>
<tr>
<td></td>
<td>(1.043)</td>
</tr>
<tr>
<td>W5</td>
<td>3.214**</td>
</tr>
<tr>
<td></td>
<td>(1.257)</td>
</tr>
<tr>
<td>Total sample</td>
<td>200</td>
</tr>
<tr>
<td>LR Chi-square(5)</td>
<td>316.971</td>
</tr>
<tr>
<td>Pseudo r-squared</td>
<td>0.863</td>
</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>0.000***</td>
</tr>
</tbody>
</table>

*** p<0.01, ** p<0.05, * p<0.10: Values in Parenthesis form are standard Errors

The estimated coefficients of OLRM are presented in table 3. The Chi-square value of Y order (HESD) is 316.971 and the p- the range is 0.0000 at the 1% level & indicating the overall model is fit.

The independent variables age (W1), family size (W2), income (W3), landholding (W4) and covidvaccine19 (W5) are significant. The range of R-square is 0.848. So, a 86% variation in Y order (HESD) is due to the independent variables and another 14 % change by other outside forces. Pseudo- R² range 0.863. And presents our model is perfect.
In OLRM W1 has a positive coefficient and a significant level of 1%. That shows one unit increase in W1 is associated with a 0.510 unit increase in Y order (HESD), and the remaining variables that are present in our model are held constant. The same result has been explained by Richardson et al. (2003), Chassidy, (2012) and Richardson, (2015). The coefficient value of the W2 has a negative sign and it is highly significant & indicates a 1 unit increase in W2 is associated with a 1.306 unit decrease in Y order (HESD) of being in a higher category. The same result has been explained by Shafiq et al. (2019) about household family size, with higher levels of education, families prefer a smaller number of children as compared to those households that have lower levels of education.

The W3 coefficient has a positive value and at the 1% level, it is highly significant and indicates a 1 unit increase in W3 is associated with a 3.473 unit increase in Y order (HESD). The same result has been explained by Badea et al (2020), Shafiq et al. (2019) and Branden (2013). W4 coefficient has a negative value and at the 5% level, it is significant and indicates that a 1 unit increase in W4 is associated with a 2.205 unit decrease in Y order (HESD). The same result has been explained by Komives et al. (2019), Alam et al. (2009) and Chaudhry and Rahman (2009). W5 coefficient has a positive value and at 5% it is significant and indicates an increase of 1 unit in W5 is associated with 3.214 unit increases in Y order (HESD). The same result was explained by Mohamed et al. (2021) and leng et al. (2021).

5. Conclusion and Suggestions

The present study explores the various factors that affect household HESD in southern Punjab, Pakistan. The study concluded that age and income have positive coefficients and which indicates a household higher level of education has a positive impact on sustainable development for creating sustainability in the future, and household family size and landholding have negative coefficients and which indicates higher levels of education, families prefer a smaller number of children as compared to those households that have lower levels of education. Furthermore, the final results of OLR, covidvacine19 have a direct effect on households with higher levels of education and have a good response to a healthy life so they prefer vaccines to protect family members from pandemic disease. The role of higher education is a good way to integrate development and sustainability in the future. Higher education is a framework for learning to live for sustainable development that interlinked the future of people and the planet. So we need higher education to help our poor communities and bring awareness in families to how higher education helps us to live on a planet for sustainable development.

Higher education for sustainable development teaches us how we preserve our environment from poverty, the loss of biodiversity, pandemics, and rising sea levels and how to increase development sustainability for the future generation. Higher education for sustainable development involved much basic knowledge and valuable techniques that increase our vision of how all things relate to challenges or risks. It helps us to preserve the environment for future generations to use economically friendly production techniques that protect the resources of an economy and increase development for sustainability in the future. In this way, we are transforming our poor local community from a national level to a global level. Proper policies should be implemented that increase the interest of the government to increase funding for educational institutions at the province level in creating sustainable development in the future in southern Punjab Pakistan.
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