RELATION OF SUSTAINABLE DEVELOPMENT WITH SCIENCE EDUCATION AND HUMAN NEEDS AND GREED

P.C. Agarwal and I.B. Agarwal

Regional Institute of Education, NCERT, Ajmer-305004. Rajasthan
E-mail: pcagca@yahoomail.com

The challenge of meeting needs for human development while protecting the life support system on mother earth confronts scientists, technologists, policy makers and communities from local to global level. Many believe that *people who have studied science* play central role in sustainable development. While many other believe that human needs and greed eradicates the discrimination between them and *those who have not studied science*. Keeping in view the role of science education and the role of human needs and greed, this paper is an attempt to find out the relationship of the two independent variables—science education and humans' future aspirations and plans for expenditure with one dependent variable—sustainable development. To carry out this study, the following standardised tools were used:

(i) Scale for way of fulfillment of daily requirement (SWFDR)

(ii) Scale for general awareness for the future consumption pattern (SGAFCP)

The sample consisted of 90 (–45 studied science and –45 did not study science) persons belonging to middle class families in the age group of 21 to 60 years from Ajmer city. The data were collected using random sampling and execution of above tools. Using relevant statistical techniques, it is found that there is a significant mean difference between the groups of science educated and non-science educated persons on the scale SWFDR scores, on the basis of the obtained scores employing SWFDR, three groups were formed for higher, lower and average scores. No significant difference is found among these three groups on the basis of second scale (SGAFCP) scores. This shows that science education plays central role in sustainable development, however, humans' needs and greed eradicate the difference between science educated and non-science educated persons.

Key words: *Sustainable development, human needs and greed, science educated persons, non-science educated persons*

Introduction

Sustainable development [Mebratu, 1998 and NCERT, 2003] implies meeting the basic needs of everyone and extending to all the opportunity to satisfy their aspiration for better life without compromising to the needs of the future. Development is the essential process for human society, countries and world. Today the world is facing various crises. The rising populations in the developing countries and the affluent consumption and production standards of the developed world have put a great stress on the supplying resources and management of assimilating waste. Many resources have become extinct and the waste generated is beyond the absorptive capacity of nature. Human greed for the demand of resources for both the production and consumption has gone beyond the rate of regeneration of resources increasing the pressure on the absorptive capacity of the nature and has led to degradation of resources.

The challenge [Jai Ganesh, et. al, 2013] of meeting needs for human development while protecting the life support system on mother earth confronts scientists, technologists,

policy makers and communities from local level to global level. Many believe that science educated persons play central role in sustainable development. While many others believe that human needs and greed eradicate the discrimination between people who have studied science and those who have not keeping in view the role of science education [Heuer, 2013] and the role of human needs and greed, this paper attempts to find out the relationship of two independent variables— science education and humans' future aspirations and plans for expenditure with one dependent variable—sustainable development.

To assess which factor is influencing more or plays a key role in the present scenario of sustainable development, this study involves both who are educated in science and technology and those who are not educated in science and technology at the graduation level.

To determine the role of science and technology which would lead the development of sustainability, following standardised tools were used.

(i) Scale for way of fulfilment of daily requirement (SWFDR)

(ii) Scale for general awareness for the future consumption pattern (SGAFCP)

Objectives

(i) To measure the differences of the two groups on scores against SWFDR with various dimensions, and

(ii) To measure the effect of their way of fulfilment of daily requirements on their future expenditure pattern or plan which provides clues for the path of sustainable development.

Hypothesis

(i) There is no significant difference between mean scores of two groups for SWFDR.

(ii) There is no significant effect of the way of fulfilment of needs or requirements on general awareness for their future planned expenditure.

Methods and Procedure

In this study, the authors tried to measure the way of fulfilment of daily requirements. Two groups were formed. One group was consisted of randomly selected science teachers and science graduates of all age groups belonging to middle class families. The other group consisted of traders, contractors, brokers and housewives belonging to middle class families. To assess how they meet their needs, SWFDR was conceptualised. This scale included the following four dimensions:

(i) Consumption of energy,
(ii) Changing pattern of lifestyle,
(iii) Garbage management, and
(iv) Re-cycle and reuse of things.

Every dimension was represented by ten items. There were total 40 assessment items in this scale. Both positive and negative items were used in the scale. A three-point (level) rating scale has been used to measure requirements against SWFDR in the form of always, sometimes and never. Scores assigned for responses of positive items were 2, 1 and 0, while 0, 1 and 2 were for responses of negative items.

Table 1

Mean and SD of scores of SWFDR

Score	N	Mean	SD
Science graduates	45	56.58	18.37
Non-science graduates	45	42.27	19.10

Table 2

Summary Data and Analysis of Variance from score of SWFDR

Sources of variance	Sum of Squares	d.f.	Mean squares	F
Between groups	4608.18	1	4608.18	13.13
Within groups	30895.78	88	351.09	

Table value at .01 level 3.95, at .05 level 6.92

To measure the general awareness for future consumption pattern, the tool against SGAFCP was also administered on the same group simultaneously. This tool also included total 40 assessment items consisting of positive as well as negative items. Three-point scale was used for rating the scores in the same way as was done for scoring of responses against SWFDR. In SGAFCP, items regarding respondents, future consumption or expenditure pattern were constructed along with items for the way of disposal of old things replaced by new ones. In this manner we intended to measure respondents' awareness for environment and resources, greed and practice followed for the use of non-traditional resources.

To cover the objectives of the study, primary data were collected administering tools for both SWFDR and SGAFCP. Random sampling method was used to select units from the population. The sample consisted of 90 (–45 people who have studied science and –45 of those who have not) persons belonging to middle class families in the age group of 21 to 60 years from Ajmer city.

To know the mean difference of two groups, means, standard errors and critical ratios were used. Also, to know the effect of the way of fulfilment of needs or requirements on general awareness for their future planned expenditure ANOVA (F-Ratio) was used.

Results and Discussion

Mean and SD of scores of SWFDR are presented in Table 1 while summary data and ANOVA results on the scores of SWFDR are given in Table 2.

Calculated F value is 13.13 and is greater than the table values at significance level of both .01 and .05. Hence there is significant difference between groups of science graduates and non science graduates. The first hypothesis is clearly rejected.

People who have studied science scored higher and others obtained lesser compared to their average score. This shows that science education plays the prime and central role to proceed on the path of sustainable development. Persons educated in science

use (consume) less energy and use scientific and improvised methods rather than traditional methods. They effectively used or managed garbage and e-garbage which is very harmful for the nature.

On the basis of the obtained mean score for first tool three groups were formed:

groups regarding general awareness for the future consumption pattern.

Conclusion

The results from the present study reveal that every person had a dream to raise income, improve the standard of living and live lavishly

Table 3

Mean and SD of higher, average and lower score groups

Score	N	Mean	SD
Higher	23	41.83	14.42
Average	44	39.82	17.14
Lower	23	41.65	18.31

Table 4

Summary Data and Analysis of Variance from score of SGAFCP

Sources of variance	Sum of Squares	d.f.	Mean squares	F
Between groups	83.33	2	41.67	0.15
Within groups	24585.07	87	282.59	

Table value at .01 level 3.95, at .05 level 6.92

(i) Higher score group: 25 per cent of the sample (i.e., 23 persons with higher score)

(ii) Average score group: 50 per cent of the sample (i.e., 44 persons with middle score), and

(iii) Lower score group: 25 per cent of the sample (i.e., 23 persons with higher score)

Calculated F value is 0.15, which is much less than the table values for both significant levels of 0.01 and 0.05. This shows that there is no significant difference among these three

irrespective of the person is science graduate or non-science graduate. As income of the people increase their consumption of goods also increase. They also imitate or copy the consumption level of their neighbours or other families in community. So 'demonstration effect' (Ahuja, 2010) is observed. Their needs also keep on multiplying irrespective of their educational background. With increasing demand for goods, the environment has not been able to regenerate itself. The carrying capacity or absorptive capacity of the environment continues to be stretched. The supply of every resource, which was in

abundance, is now limited and the quality of resources have been deteriorated. So, the fact is clearly established that if the present is miserable, it is due to increasing needs and greed and, therefore, needs and greed are to be checked immediately. Clearly, the future must not inherit the problems but the resources to achieve a better life.

References

AHUJA, H.L. 2010. *Macroeconomics: Theory and Practice*. p. 163. Published by S. Chand & Co. New Delhi.

HEUER, R.D. 2013. The Role of Science for Sustainable Development of the Society, CERN, UN-CSTD, Geneva, website: unctad.org/meetings/presentation/CSTD_2013_CERN_Heuer.pdf.

JAI GANESH, V. AND P.K. NAGARAJAN, 2013. Science and Technology for Sustainable Development in Indian Scenario. *International Journal of Chemical Engineering*. Vol. 4, No. 2. pp. 66–68.

MEBRATU, D. 1998. Sustainability and Sustainable Development: Historical and Conceptual Review, *Environmental Impact Assessment Review.* Vol. 18, pp. 493–520, Elsevier Science Inc.

NCERT, 2003. *SOCIAL SCIENCE PART II, A TEXTBOOK FOR CLASS X*, P. 79. New Delhi.