Socioeconomic Determinants of Sustainable Rural Development: A Study of Women from Rural India

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Abstract:

The research attempts to examine the socioeconomic determinants of sustainable rural development with a focus on women from rural India. The structure of sustainable rural development included three components: social inclusion, economic growth and environmental protection. Married Women (r=0.299, p=0.000) with higher educational qualification (r=0.515, p=0.000) and younger in age (r=-0.428, p=0.000) demon started higher financial literacy levels as compared to others. Results of linear regression indicated that financial literacy is significantly influenced by education, woman's relationship with environment and informal economy such as her work situation, role in decision making and preparing household budget. The study concluded that education was the most important socioeconomic determinant of sustainable rural development, hence providing education to rural women could be a catalytic step towards the sustainable development of rural India.

Keywords: sustainable development, women, rural India, social inclusion, economic growth, environmental protection, education.

1. Introduction

Development is a multi-dimensional process involving changes ineconomic, environmental, social and demographic components, as well as the acceleration of quality of life, the reduction of inequality and eradication of absolute poverty.

By comparison with development, rural development is a much newer term. Rural development emerged as a distinct focus of policy and research in the 1960s and gained full momentum in the 1970s, as observers increasingly realized that, while economic growth and industrialization were important, rural areas and rural development had still more important, larger and different roles to play in a country's development.

Although agricultural growth is a very important dimension of rural development, especially in India,it is not enough on its own to ensure economic growth in rural areas. Other sectors or dimensions come into play in the process of rural growth, such as health, education and economic activities outside the agricultural sector.

Thus, rural development is broader than agricultural development, encompassing many sectors and addressing links between the social, technical, economic, political, institutional and ecological dimensions of rural change. Its goal is essentially achieving equitable growth to benefit the poor in rural areas. The means include investment in agriculture, improved rural services and infrastructure, institutional reform, health,

technological change, economic change, political reform – all combined with measures to ensure environmental sustainability. It requires a truly multi-disciplinary approach.

Environmental concerns-especially those relating to climate change-are now at the forefront of the rural development agenda, so that we rarely talk about 'rural development' but rather 'sustainable rural development'. Sustainability comprises interlocking economic, social and ecological dimensions; and the relationship between them must be addressed for sustainability to be effective. The sustainable livelihoods approach to development provides a holistic framework for analyzing poverty and identifying potential solutions and became popular with many development agencies in the opening years of the 21st century.

The extensive reach of women's agency is one of the most neglected areas of development studies, especially when it comes to rural development. Indeed, environmental, economic and social participation of women is acrucial aspect of" sustainable rural development". Therefore, this study examines the socioeconomic determinants of sustainable rural development with particular attention on the women of selected villages of Patiala district, Punjab in India.

1.1 *Definition of Sustainable Development*

United Nations defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected and essential for the well-being of individuals and societies.(https://www.un.org/sustainabledevelopment/development-agenda/#).Therefore,thepresentstudy has included all of these three elements while constructing the structure of sustainable rural development. This structure has been discussed in the section of materials and methods.

1.2 *Financial Literacy*

PradhanMantri Jan-DhanYojana (PMJDY) is National Mission for Financial Inclusion to ensure access to financial services, namely, a basic savings & deposit accounts, remittance, credit, insurance, pension in an affordable manner. Under the scheme, a basic savings bank deposit (BSBD) account can be opened in any bank branch or Business Correspondent (Bank Mitra) outlet, by persons not having any other account. Under this scheme one basic bank account is opened for unbanked person with no requirement of minimum balance. The world's largest financial inclusion scheme using PMJDY scheme has been very effective as 40 crore people have been included by opening of bank accounts since 2014. It has provided the Government huge infrastructure support for implementing schemes related to Direct benefit Transfers (DBT) meaningful during demonetisation. It also acted as a lifeline recently during the coronavirus pandemic-led lockdown when the government transferred cash directly into the bank accounts of migrant labourers and poor sections of the society. It also ensured four social security schemes, which are PradhanMantriJeevanJyotiBimaYojana (PMJJBY), PradhanMantriSurakshaBimaYojana (PMSBY), Atal Pension Yojana (APY), and PradhanMantri Mudra Yojana (PMMY) to be attached with it. With the scheme, the government provided zero-balance Basic Savings Bank Deposit (BSBD) accounts with additional features of RuPay debit card and overdraft. The government and its regulatory

bodies like SEBI, RBI, IRDA are doing extensive work in promoting financial literacy to reach to underprivileged, uneducated and people in rural areas.

The IRDAI Micro-Insurance Regulations, 2015 defines micro-insurance as life insurance policy with a maximum sum assured of Rs. 2 Lakhs or less. The coverage of the amount starts as small as Rs. 5,000 to Rs. 10,000 for a small period. Micro-insurance products were launched to provide financial protection to people at the bottom of the pyramid, low income households and reaching to rural areas where other schemes are not available. It has been designed specifically for lower valued assets and compensation for illness, injury or death. It includes life micro-insurance and genera micro-insurance products. It also noted that improving access of PMJDY account holders to micro-credit and micro investment such as flexi-recurring deposit among others would be emphasised going ahead.

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. The digital payment platforms have also been promoted by the Government in rural areas after demonetisation, by using Unified Payments Interface (UPI), Unstructured Supplementary Service Data (USSD), Aadhar Pay, Immediate Payment Service (IMPS) and Debit Cards (RuPay debit card).

2. Materials and Methods

This section provides details of spatial distribution of study population, sample selection methods and study variables.The structure of sustainable rural development,which was applied in the present study, has also been discussed, here, thoroughly.

2.1 *Study Design and Methods*

This cross-sectional study with survey design was based on the methodological guidance developed by the International Network on Financial Education(OECD INFE (2011).Population of the study included women,aged more than 18 years, belonging to rural areas of Patiala District which is located in the Malwa region of South Eastern part of Punjab in India. Thesubjectswere selected through stratified random sampling technique. The entire target population of Patiala District was divided into nine main strata (subgroups) on the basis of block wise division of Patiala district, Punjab. Two villages from each block were then randomly selected for survey.Thewomen participants,from this total of 18 villages, were also selected randomly.Thus, the sample for the present study comprised of360women distributed over 18villages (20 women from each village) belonging to nine blocks-Patiala, Rajpura, Nabha, Samana, Bhunerheri, Patran, Ghanour, ShambhuKalan and Sanaurof Patiala district in the State of Punjab, India. A clear and unambiguous description of the survey was provided so as to encourage them to cooperate in this important research.

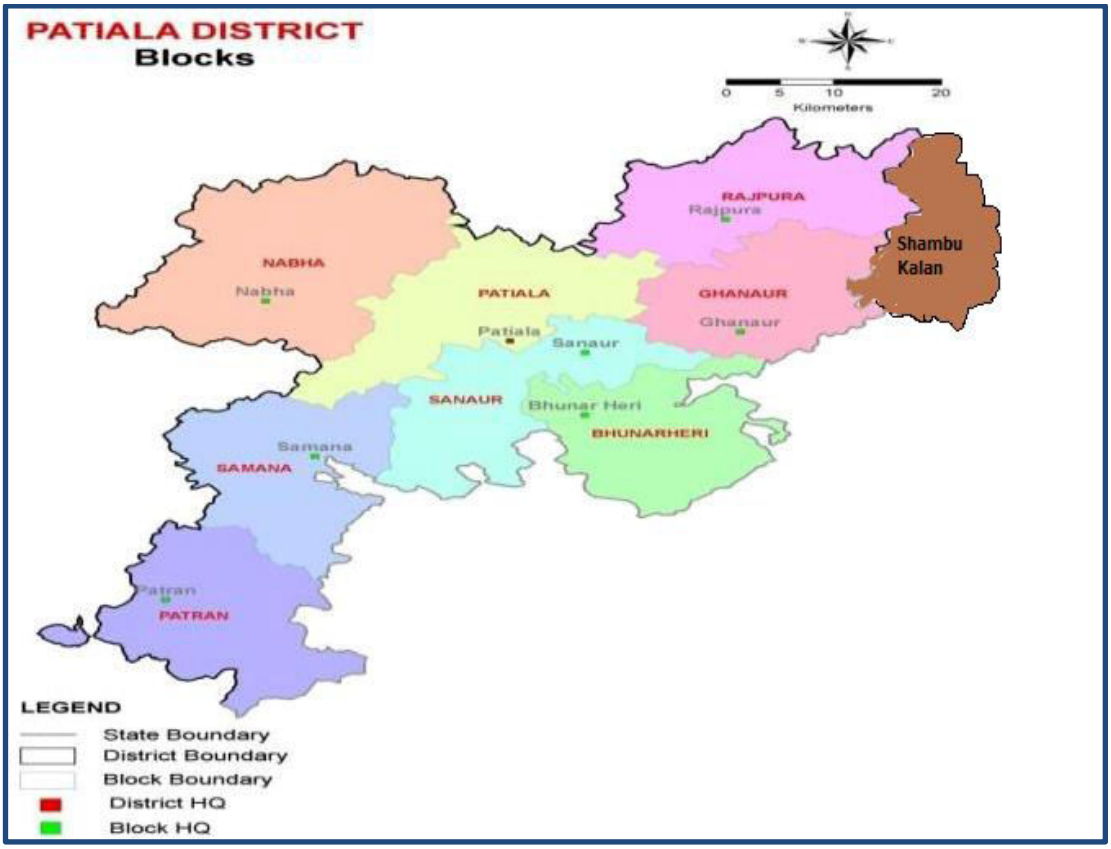

Figure 1: Spatial Distribution of study population

2.2 *Structure of sustainable rural development*:

Figure 2 displays the structure of sustainable rural development that was applied in the present study. It was adapted fromthe reports published by Stanny and Czarnecki (2010) on the national scientific project entitled "Social and Economic Preconditions of the Sustainable Development of the Green Lungs of Poland Rural Areas in the NATURA2000 Network".It is imperative to highlight that the three components (economic growth, social inclusion and environmental protection) of this structure have been adopted from the UN definition of sustainable development.

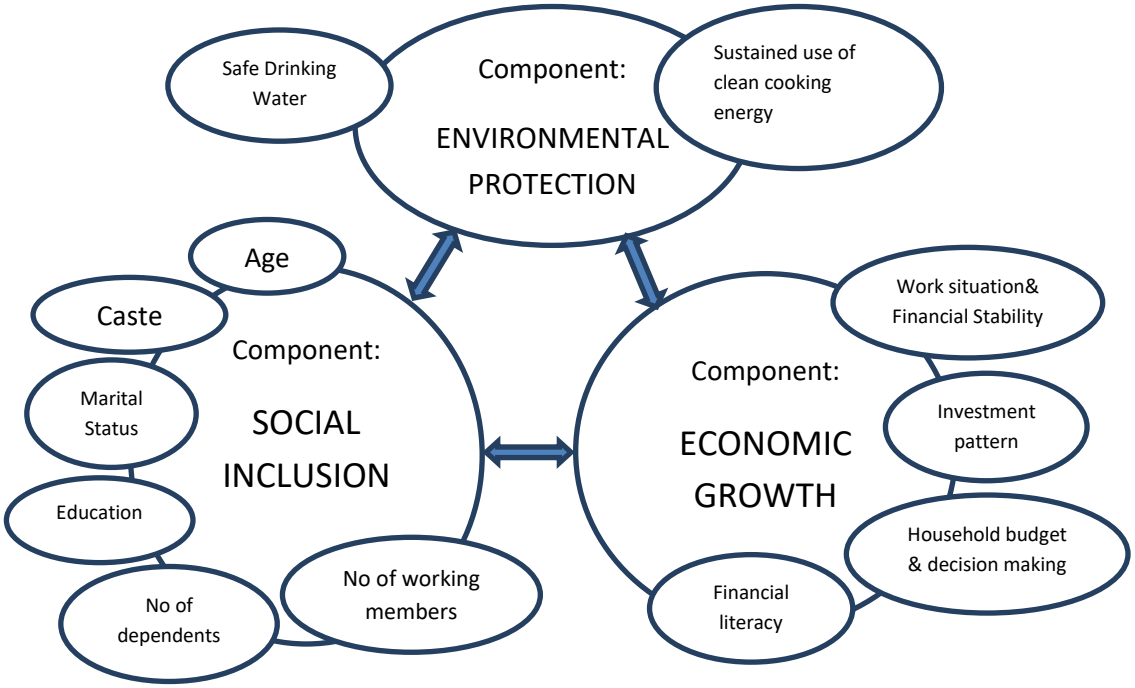

Figure 2: Structure of sustainable rural development as applied in the present study

2.3 *Tools for data collection*

Personal interview, i.e. face to face interview was conducted with each woman participant to collect the information on a questionnaire that was adapted from The OECD Financial Literacy Questionnaire developed by the International Network on Financial Education (INFE).This questionnaire had addressed all the variables which have been included under the three crucial components of the structure of sustainable rural development. These variables have been displayed in figure 1. The financial literacy variables have been adapted from Gakhar (2019) scale for investor behavior.

2.4 *Analytical Framework*

The information provided by participants became the raw data for the present study. This raw data was entered into Microsoft Excel sheet in order to facilitate analysis. SPSS 25 version was used to carry out all analyses. It was ensured that none of the contact details collected during fieldwork is used for any purpose other than to validate the survey responses. Data confidentiality statements were provided to participants.

3. Results

Descriptive analysis was used to analyze the variables of three essential components of the structure of sustainable rural development that was applied in present study, namely social inclusion, environmental protection and economic growth. The inter-relationship between these components was analyzed by using either Chi square, bivariate, or multivariate techniques. Linear regression backward method has been used to investigate the factors influencing the financial literacy among the women of rural India. The findings of the study have been presented in the form of tables and graphs.

3.1 *Social inclusion*

It was encouraging to observe that all women examined in the present study, had ID proof in the form of either Aadhar card or Voter card. Nevertheless, only 50.27% (181/360) women knew their exact age. This lack of awareness about the age is reflected in their level of education. Table 1 suggests that maximum no. of women respondents were in the age group of 30-50 years (40.3%) followed by 50-70 years (38.1%). A very small proportion of these women were less than 30 years old with least no. of women having age above 70 years. One of the discouraging findings,about the rural women of northern India, was that most of them had not received the formal education. Only 10.6% women had attained university level education while technical skill was still scanty (3.3%).Additionally, these women with university level education and technical skill were either young (less than 30 years) or adults (30-50 years). On the other hand, women without formal education were past 50 years of age. Thus, as indicated by table 2, there is a statistically significant association between age and education with younger women being more educated than their older counterparts.

Table 1: Socio-demographic characteristics of study population (n=360)

Characteristic	Categories	Frequency	Percentage
Age			
	Less than 30 years	62	17.2
	30-50 years	145	40.3
	50-70 years	137	38.1
	Above 70 years	16	4.4
Education			
	No formal education	141	39.2
	Primary	78	21.7
	Secondary	91	25.3
	Skill / Technical	12	3.3
	University level	38	10.6
Marital Status			
	Married	302	83.9
	Single or Living alone due to various reasons	58	16.1
Caste			
	Schedule caste	151	41.9
	Backward class	67	18.6
	General Category	142	39.5

Table 2: Association between age and the level of education of rural women respondents

			Age				Total	Chi-Square	p-value
			Less than 30	30-50 Years	50-70 Years	70 Years and above			
Education	Uneducated	Count	0	25	101	15	141	253.372[a]	.000
		% within Education	0.0%	17.7%	71.6%	10.6%	100.0%		
		% within Age	0.0%	17.2%	73.7%	93.8%	39.2%		
		% of Total	0.0%	6.9%	28.1%	4.2%	39.2%		
	Primary	Count	8	47	23	0	78		
		% within Education	10.3%	60.3%	29.5%	0.0%	100.0%		
		% within Age	12.9%	32.4%	16.8%	0.0%	21.7%		
		% of Total	2.2%	13.1%	6.4%	0.0%	21.7%		
	Secondary	Count	18	59	13	1	91		
		% within Education	19.8%	64.8%	14.3%	1.1%	100.0%		
		% within Age	29.0%	40.7%	9.5%	6.3%	25.3%		
		% of Total	5.0%	16.4%	3.6%	.3%	25.3%		
	Skill / Technical	Count	7	5	0	0	12		
		% within Education	58.3%	41.7%	0.0%	0.0%	100.0%		
		% within Age	11.3%	3.4%	0.0%	0.0%	3.3%		
		% of Total	1.9%	1.4%	0.0%	0.0%	3.3%		
	University	Count	29	9	0	0	38		
		% within Education	76.3%	23.7%	0.0%	0.0%	100.0%		
		% within Age	46.8%	6.2%	0.0%	0.0%	10.6%		
		% of Total	8.1%	2.5%	0.0%	0.0%	10.6%		
Total		Count	62	145	137	16	360		

	% within Education	17.2%	40.3%	38.1%	4.4%	100.0 %		
	% within Age	100.0 %	100.0 %	100.0 %	100.0%	100.0 %		
	% of Total	17.2%	40.3%	38.1%	4.4%	100.0 %		

Amongst the sample population, 83.9 % of the women were married and living with their spouses. The remaining 16.1% women were single or living alone due to various reasons such as being unmarried or widow or divorced. On an average, each household had 1-2 children less than 18 years whereas 3-4 people aged 18 years or more. This finding emphasizes the firm belief of rural women in traditional values of marriage and family. Coming to the caste based distribution, 41.9% of the women belonged to the Scheduled class, 18.6% of the women belonged to Other Backward classes (OBC) and 39.5% belonged to the General category. Table 3 shows the statistically significant association between caste and the level of education. On comparison between the groups, it was observed that 14.79% women respondents with University level education belonged to general category whereas 13.23% to backward class and only 5.34% to schedule caste. On the contrary, more no. of women with no formal education was found in backward class (44.12%) and schedule caste (40%) as compared to general category (35.92%). These findings are well in line with those of Kaur (2016) who examined educational status of rural women from four districts of Malwa region of Punjab and reported that scheduled caste women are at the bottom of the scale with abysmally marginal levels of education.

Table 3: Association between caste and the level of education in rural women respondents

	Categories	Caste			Chi square	Sig.
		General	SC	BC		
Education	Uneducated	51	60	30	18.001	0.021
	% within caste	35.92%	40%	44.12%		
	Primary	25	44	9		
	% within caste	17.61%	29.33%	13.24%		
	Secondary	42	32	17		
	% within caste	29.58%	21.33%	25%		
	Skill / Technical	3	6	3		
	% within caste	2.11%	4%	4.41%		
	University	21	8	9		
	% within caste	14.79%	5.34%	13.23%		
	Total	142	150	68		

3.2 *Environmental protection*

The environment related component of the structure of sustainable rural development, in the present study, was judged on the basis of the accessibility of rural women to clean energy and safe drinking water. As exhibited in table 4, most of the rural

women had an access to clean energy in the form of LPG with only 7.8% women relying totally upon traditional three stone chulha or U-shaped mud chulha.These figures are far better than the National figures which suggest that only 24% of rural households use clean fuel for cooking (National Family Health Survey IV).The current findings might be the indicator of the success of PradhanMantriUjjwalaYojna (PMUY) as many of the women respondents had subsidized LPG connections under the said scheme launched by the Indian Government in May 2016. The central government claimed that by December 2018, 60 million households had received access to LPG through the UjjwalaYojana, and that 90% of all Indian households owned an LPG cylinder and stove (GoI 2019). Nevertheless, this substantial increase in access to LPG ownership is not deterrent to the use of solid fuels, because as suggested by table 4, many of rural households (41.9%) also use traditional cook stove. This finding is in consistency with Gupta *et al.*(2020)who presented survey evidence from North India showing persistent solid fuel use despite increases in LPG ownership. They suggested that household economic status, relative costs of cooking fuels, genderine quality, and beliefs about solid fuels were important contributors to high solid fuel use.

Table 4: Accessibility to clean energy and safe drinking water

Characteristics	Categories	Frequency	Percentage
Type of cooking stove			
	Chullah	28	7.8
	LPG+ Chullah	151	41.9
	LPG stove	181	50.3
	Electric stove	0	0
	Solar stove	0	0
Accessibility of safe drinking water			
	Combined motor	16	4.4
	Own motor	215	59.7
	Own motor+ govt. supply	34	9.4
	Govt. supply	95	26.4

Table 4 also displays the data regarding the accessibility to safe drinking water indicated that only 26.4% of women relied fully on the government water supply. Rest of them had either their own motors or the unique arrangement of sharing the water supply by using the combined motor. This dependence on motor or submersible pump is causing a crucial problem of depleting the ground water of Punjab which was once a state of fertile agricultural land.According to a report by the Central Ground Water Board, with 82% of the Punjab's land area witnessing a huge decline in underground water levels and 109 administrative blocks out of 138 placed in 'over-exploited' category, a severe water crisis looms in the 'grain bowl of India.' (Bajwa, 2020)

3.3 *Economic growth*

The component of economic growth of the structure of sustainable rural development had four subcomponents: 1)work situation & financial stability, 2) investment pattern, 3)household budget & decision making power and 4)financial literacy.

All of these subcomponents have been examined in detail to understand the economic growth of rural women of India.

Table 5: Work Situation & Financial Stability among rural women

Characteristic	Categories	Frequency	Percentage
Work status			
	Not Working	262	72.8
	Working	98	27.2
Gainfully employed			
	Partially Employed	47	13.1
	Fully Employed	51	14.2
Stable income of family			
	No	166	46.1
	Yes	194	53.9
Prepare a household budget			
	No	247	68.6
	Yes	113	31.4
Role in financial decision making			
	No involvement	199	55.3
	Self and Spouse	94	26.1
	Self and other family members	40	11.1
	Independent	27	7.5

The results of economic variables, undertaken for analyzing the sustainable rural development, are shown in table 5. There is income stability in 53.9 per cent of the families. Only 27.2 per cent of the sample women respondents are working and out of those 14.2 percent are fully employed for more than 8 hours in a day.31.4 per cent of households prepare budget for managing monthly expenses in the family. Looking at the involvement of women in financial decision making in rural Punjab, only 7.5 per cent take independent financial decisions, 26.1 per cent decisions are taken in consultation with spouse and 55.3 per cent women are not involved in financial decision making in the family. Previously, Patel and his associates(2018) also reported that only 6.25 % (6/96) households had women as the decision makers.

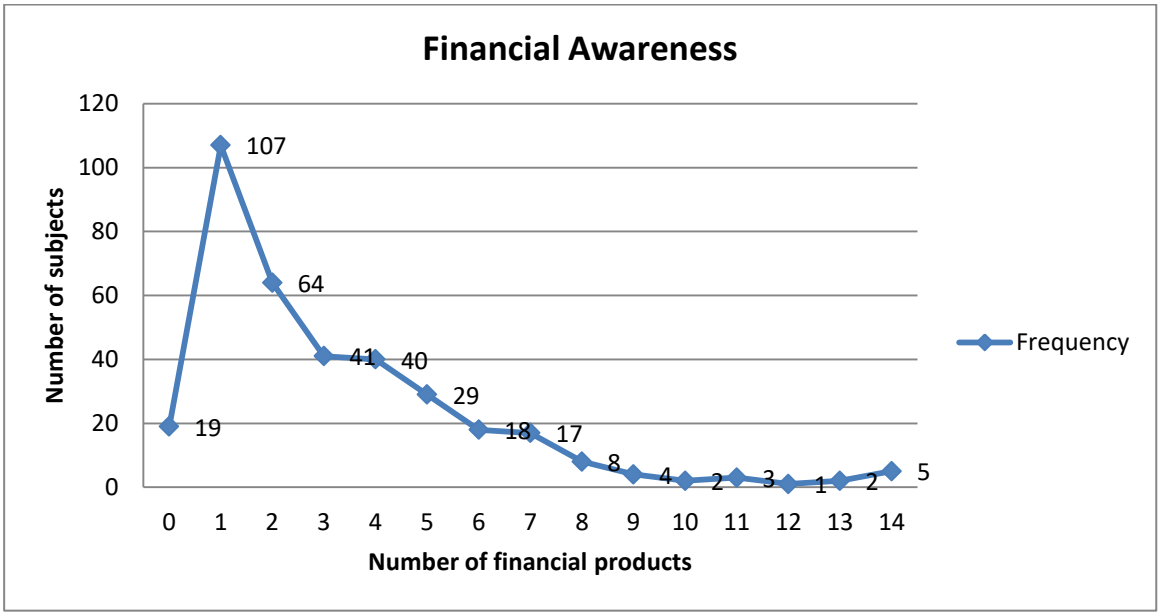

Figure 2: financial awareness among rural women respondents

Table 6: Investment Pattern among rural women of India

Investment Pattern		
	Frequency	**Percentage**
Low Risk Financial Products	259	71.9
Medium Risk Financial Products	26	7.2
High Risk Financial products	1	.3
Total	286	79.4

Table 6 shows investment pattern of women in rural Punjab. 71.9 per cent women invest in low risk instruments which primarily includes banking related investment instruments. Lascu *et al*. (1997); Loible and Hira (2007), also found that women are risk averse. 7.2 per cent women have investment in medium risk instruments and only 0.3 per cent women have invested in high risk instruments. Most of the women have joined banking system through PMJDY (PradhanMantriJan DhanYojna).

Table7: Financial literacy level based on Awareness about type of financial product

Categories	**Frequency**	**Percentage**
Low risk instruments		
Yes	343	95.3
No	17	4.7
Medium risk instruments		
Yes	18	5.0
No	342	95.0
High risk instruments		
Yes	15	4.2
No	345	95.8

Financial literacy level of women in rural Punjab has been judged through asking them about awareness of investment products. These investment instruments were categorized as low risk instruments, medium risk instruments and high risk instruments. Under the low risk instruments category products like saving bank account, fixed deposits, provident funds, tax saving instruments, gold and government securities have been included (Murithi *et al*., 2012), Gakhar, D. (2019). For medium risk instruments category instruments like mutual funds, real estate and ETFs have been classified (Gakhar, D., 2019). And high risk instruments include awareness about equity shares, bonds and derivatives instruments (Chakraborty *et al*., 2011 and Gakhar, D., 2019). 95.3 per cent women are aware about low risk instruments including saving bank account, fixed deposits, provident fund and government securities like KisanVikasPatra, post office schemes and the like.

Only 5 per cent rural women are aware about mutual funds, real estate and ETFs. Pati *et al*. (2011) found that Indian households prefer to go for bank deposit schemes rather than investment in stock markets. Shollapur *et al*. (2008) revealed that corporate securities are less preferred by Indian investors.Awareness about high risk instruments from the stock market like equity, bonds and derivatives is lowest amongst rural women (4.2 per cent).Men are found to be more risk-seeking than women (Croson and Gneezy, 2009). Individual biological differences also have an impact on risk taking attitude (Dreber *et al*., 2009). It has been observed that due to biological and socio-cultural factors men are ready to take more amount of risk as compared to women. Croson *et al*. (2009) found that older men and women are more risk averse as compared to younger men. Charness and Gneezy (2010) found that women trade less than men.

Table 8: Awareness about other Financial Schemes among study population

Awareness about other financial Schemes		
	Frequency	Percentage
Awareness about digital payment platforms		
Yes	101	28.1
No	259	71.9
Awareness about micro insurance products		
Yes	145	40.3
No	215	59.7
Awareness about micro finance products		
Yes	149	41.4
No	211	58.6
Borrowing behavior		
Yes	14	3.9
No	346	96.1
Awareness about Government Schemes		
Yes	191	53.1
No	169	46.9

Table 8 discusses about level of financial literacy amongst women in rural areas of Punjab. 41.4 per cent women are aware about micro finance schemes available through banking and other platforms. 40.3 per cent women know about insurance products offered by financial institutions under micro insurance schemes. With regard to various government schemes 53.1 per cent respondents are aware about them. After

demonetization, when digital payment platforms were popularized by the Government, women in rural areas also got to know about them (28.1 per cent). Only 3.9 per cent women have borrowings under micro finance schemes.

3.4 *Associations among the essential components of the structure of sustainable rural development*

The main objective of the present study was to examine the socioeconomic determinants of sustainable rural development. Therefore, statistical analysis was carried out to investigate the associations amongthree core elements of sustainable development: economic growth, social inclusion and environmental protection. As displayed in table 9, 62.68% women respondents in general category, had an access to clean energy as compared to 50% of backward class and 38.67% of schedule caste.According to James *et al* (2020), people from low socio-economic background are forced to use solid fuels as these are available easily in rural areas at a lower cost.

Table 9: Association between caste and variables of environmental protection and economic growth

	Categories	Caste			Chi square	Sig.
		General	SC	BC		
Type of cooking stove	Chula	5	14	9	21.038	.000
	% within caste	3.52%	93.33 %	13.24 %		
	LPG+Chula	48	78	25		
	% within caste	33.80%	52%	36.76		
	LPG	89	58	34		
	% within caste	62.68%	38.67 %	50%		
	Total	142	150	68		
Accessibility to safe drinking water	Combined motor	1	15	0	69.926[a]	.000
	% within caste	0.70%	10%	0%		
	Own motor	118	61	36		
	% within caste	83.10%	40.67 %	52.94 %		
	Motor+ govt supply	11	16	7		
	% within caste	7.75%	10.67 %	10.29 %		
	Govt supply	12	58	25		
	% within caste	8.45%	38.67 %	36.76 %		
	Total	142	150	68		
Income stability	No	47	86	33	17.439	.000
	% within caste	33.10%	57.34 %	48.53 %		
	Yes	95	64	35		

	% within caste	66.90%	42.67 %	51.47 %		
	Total	142	150	68		
Role in decision making	No involvement	88	70	41	19.373	0.004
	% within caste	61.97%	46.67 %	60.29 %		
	Self and spouse	29	49	16		
	% within caste	20.42%	32.67 %	23.53 %		
	Self and other family member	11	25	4		
	% within caste	7.75%	16.67 %	5.88%		
	Independent	14	6	7		
	% within caste	9.86%	4%	10.29 %		
	Total	142	150	68		
Household budget	No	88	117	42	10.526	0.005
	% within caste	61.97%	78%	61.76 %		
	Yes	54	33	26		
	% within caste	38.03%	22%	38.24 %		
	Total	142	150	68		

Table 9 further exhibits that women of general category had also better accessibility to safe drinking water by using their own motor whereas women belonging to backward class (36.76%) as well as schedule caste (38.67%) had to depend on govt. water supply. The comparison of income stability between the groups suggested that more no. of women in general category (66.90%) exhibited income stability than in backward class (51.47%) or schedule caste (42.67%). Nevertheless, backward class women were more empowered than general or schedule caste in terms of role in decision making and preparing household budget. Thus, schedule caste women respondents had lack of access to clean energy, safe drinking water, income stability, independent decision making and preparing household budget.

Table 10: Association between the component of environmental protection and income stability

	Categories	Income Stability			Chi Square	Sig.
		No	Yes	Total		
Type of cooking stove	Chulha	12	16	28	53.229	.000
	% within Income Stability	7.20%	8.20%	7.80%		
	LPG+Chulha	103	48	151		
	% within Income Stability	62%	24.70%	41.90%		
	LPG stove	51	130	181		
	% within Income Stability	30.70%	67%	50.30%		
	Total	166	194	360		
Accessibility to safe drinking water	Combined motor	13	3	16	9.497	.023
	% within Income Stability	7.80%	1.50%	4.40%		
	Own motor	94	121	215		
	% within Income Stability	56.60%	62.40%	59.70%		
	Own motor+ Govt. Supply	13	21	34		
	% within Income Stability	7.80%	10.80%	9.40%		
	Govt.Supply	46	49	95		
	% within Income Stability	27.70%	25.30%	26.40%		
	Total	166	194	360		

Table 10 shows the statistically significant associations between the subcomponents of environmental protection and income stability, suggesting the importance of reliable and stable income for the accessibility to clean energy and safe drinking water to rural women. 67% of women, using LPG for cooking purpose, had stable income as compared to 24.70% using LPG + Chulha and 8.20% using chulha only. Similarly, women who were able to afford motor or submersible pump for the drinking water, exhibited income stability. Thus, women having no income stability, had to rely upon Govt. supply for safe drinking water and traditional three stone chulha or U-shaped mud chulha for cooking purpose.

Table 11: Significant Correlation of Financial literacy with Various Variables of the Structure of Sustainable Rural Development

Variables	Correlation coefficient	Sig.
Age	-0.428	.000
Education	0.515	.000
Marital Status	0.299	.000
Access to safe drinking water	-0.148	0.005
Work situation	0.159	0.002
Awareness about govt. schemes	0.361	.000

Table 11 shows that there is high degree of positive correlation between financial literacy and education level of women (0.515) and awareness about government schemes. Chakarborty *et al*. (2011) found that purpose of savings is affected by demographic characteristics like age, occupation and the income level of investors. Higher the age lower is the financial literacy level (-0.428). Younger investors are found to be aggressive as risk takers as per Palsson (1996). Financial literacy is also positively related with marital status of women in rural areas. It was also found that marital status plays an influencing role in profiling green consumers (Diamantopoulos *et al*., 2003). Marital status also affects investment decisions (Love, 2010).

Table 12: Factors influencing Financial Literacy – linear regression backward method

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	7.111	2.435		2.920	.004
Accessibility to Safe Drinking Water	-.741	.227	-.289	-3.264	.002
Education	.721	.182	.359	3.952	.000
Work Situation	-2.953	2.299	-.114	-1.285	.202
Women Empowerment (Role in Decision Making)	.385	.230	.147	1.672	.098
Household Budget	1.470	.504	.267	2.917	.004
R square- .325; Adjusted R square .288					

Financial literacy level has been regressed with other variables of sustainable rural development. The results of OLS (ordinary least square) method are shown in table 12. Using backward method of regression, the best model fit was identified and all the variables which significantly load in the model are shown. The variable financial literacy is significantly influenced by education (socio-demographic variable), accessibility to safe drinking water (environmental variable) and work situation, role in decision making and household budget (economic variables). The overall explanation of the model is 28.8 per cent which indicates fair amount of explanation given on financial literacy by this model.

The highest coefficient is of work situation variable (-2.953) which indicates that working women have higher financial literacy as compared to not working women. Similarly, families which prepare household budget (1.470) also have more financial literacy levels, education (0.721) also contributes positively to financial literacy levels. Getzner *et al*. (2004) studied Austrian consumers for investment and found that higher education levels and higher income affect their decision. Accessibility to safe drinking water which is an environmental variable also loads significantly to the model and families having access to government water supply have lower financial literacy as compared to those who have their own motors.Sellappan (2013) found that young women invest more in shares, mutual funds, insurance as compared to older women. Also married women are more active in making investments rather than unmarried women. Mohanta *et al*. (2011) concluded that income and occupation of investor affect the investment avenue chosen by male and female investors. Chaturvedi *et al*. (2012) revealed that age, education, income and job profile affects individual investment decisions.

4. Discussion

The socio-demographic profile of rural women in study population is that of illiterate, ignorant about their age, having low skill and lack of political awareness but a firm believer of marriage and family. The lack of education among rural women has been reported by other studies (Purohit and Dwivedi, 2015; Ahmed, 2016 and Kaur, 2016). Nevertheless, highly significant association between age and the level of education ($p=0.000$), in the current study,were suggestive of the datum that the younger women or the women of the present generation are keen in getting education, as not even a single woman respondent, aged less than 30 years, was illiterate and thus, a positive step towards the eradication of illiteracy in the near future and therefore the sustainable rural development.

While this could be a catalytic step towards achievement of transformational social changes required for sustainable rural development,the statistically significant association between caste andeducation ($x^2=18.001$, $p<0.05$)highlights the need to upgrade the level of education among the women of weaker sections, i.e. backward class and schedule caste.

The present study has examined a total of 18 villages. Nonetheless, only one village -Deelwal village -hada woman sarpanch(Head of the village), suggesting the negligible participation of rural women at grass root level governance and politics.This finding is an indicator of gender inequality in power sharing and development process. A high level of illiteracy might be the major deterrent for their political awareness.

The household characteristics revealed that on an average, each household had 1-2 children less than 18 years whereas 3-4 people aged 18 years or more. 113/360 women respondents were found to be housewives whose work is not considered to be productive, though they are working 24x7. They manage household activities besides cooking, help the male force in farming and cattle breeding and also work as community resource manager. Thus, the rural women of India are overworked but unorganized and under-represented. According to the India Voluntary National Review 2020, female labour force participation rate for the 15-59 age group is showing a declining trend and stands at 25.3%, which is one of the lowest rates in the world. Meanwhile, the International Monetary Fund (IMF) estimates that equal participation of women in the workforce will increase India's GDP by 27% (Noda &Bagai, 2020). Hence, a significant yet unsung role played by rural women can be a useful lever of action for transforming the livelihoods of their families and thereby Sustainable Rural Development.

The statistically significant association between income stability and the use of clean energy suggests that women using LPG had stable and reliable income as compared to women using solid fuels. Previously many studies have reported that fuel usage in India is associated with income levels, i.e. the households with lower incomes use fuelwood whereas households with higher income use LPG (Rao *et al*., 2020).Additionally, this dependency on traditional sources of energy such as animal dung, crop waste and fuel wood, was statistically higher among the women of weaker sections (x^2=21.038, p=0.000).Thus,poor women belonging to backward class and schedule caste are more vulnerable to have adverse health effects due to household air pollution.

Many types of pollutants *viz.*, particulate matter, carbonaceous matter (elemental carbon, polycyclic aromatic hydrocarbons and other organic compounds) are found to be released, mainly, from combustion of solid biomass (Zang and Morawska, 2002). These particles are complex in terms of the physical and chemical characteristics that govern their health and environmental impacts (Eriksson *et al*., 2014; Leavey *et al*., 2017).Balakrishnan(2013) had summarized the mortality estimates due to indoor air pollution in recent research studies attributing 20% of ischemic heart diseases (IHD), 23% of stroke, 45% of chronic obstructive pulmonary disease (COPD), 21% of lung cancer and 22% of acute respiratory tract infections (ARI) to indoor air pollution. Cooking withsolid biomass fuels has been shown to be significantly associated with different health consequences, among women, by several studies conducted across India. These consequences could be ophthalmic symptoms, throat irritation, allergic rhinitis, heart and lung conditions, dermatological symptoms, severe burns and poor obstetric outcomes (Smith, 2000; Verma *et al*., 2017; Mohapatra, 2018; James *et al*., 2020 and Health Effects Institute, 2020).

The findings of present study also emphasize unawareness of the usage of electric as well as solar energy for cooking purpose among rural women of India. There is a dire need to design the policies by governmental and non-governmental organizations, for dissemination of such kind of modern and clean energy to rural women so as to ensure conservation of environment for their better future and thereby a sustainable rural development.Here is the example of 'Solar Sahelis', a Rajasthan (India) based innovative social enterprise which is now a leading clean energy marketing, sales and distribution firm. It is a unique distribution model by using a network of trained women to be the face of the firm's marketing and after-sales service. The enterprise has sold over 130,000 clean energy products in 16 districts in Rajasthan, with plans to reach up to 5 million households in the next five years. The same kind of model can be implemented in Punjab where the state has ample sunshine and there is mammoth potential for solar energy. Another example comes from an initiative by the Self-Employed Women's Association and the Electronics Sector Skills Council of India that is supported by the UN Environment Program. By training young rural women to develop a cadre of 15,000 solar technicians for the maintenance of solar pumps in remote locations, this initiative will not only introduce clean energy options but also reduce production costs. Accelerating transition to renewable energy will lower carbon footprints and can help provide sustainable livelihoods to poor women of rural India (Noda &Bagai, 2020).

As per the structure of sustainable rural development (figure 2), economic growth has to be a driver in achieving social and environmental growth in the rural India. The present Indian Government has been working towards achieving financial inclusion and imparting financial literacy in rural areas through PMJDY, micro-finance, micro-insurance and digital India schemes. However, apart from Jan DhanYojana, where the service was free, for other schemes like the SukanyaSamriddhiYojana or the Atal Pension Yojana, the

women had no clue about their existence. This makes us ponder that there is still a failure of the state, in ensuring that all the schemes made for the poor do reach them. Often the women are already burdened with the household responsibilities, working to feed their children, that they do not feel that they have the time to go to the bank and invest in these schemes. And even if they do, they feel they are harassed by the officials in the government offices, instead of making them comfortable and sorting the process for them. For a sustainable kind of model, we need to channelize the energy of the women, so that they feel confident to become aware and fight for their rights and the schemes they are eligible for. Social workers can take the best step forward and help in building the community and making the women self-reliant. PMJDY has been very successful in bringing financial literacy to rural women as most of the women respondents have joined the banking system through Jan DhanYojna. They have good level of awareness about the micro–insurance, micro-finance and digital payment schemes available,although rural women majorly invest in low risk instruments as compared to medium and high risk investment instruments. The penetration of the Government schemes in rural areas of Punjab is good and that has brought in an improvement in financial literacy level of women in rural areas, even though the usage of specialized products like micro-finance schemes, digital payment platforms, micro-insurance is still low. Married Women with higher educational qualification and younger in age have higher financial literacy levels as compared to others. Working women has also higher financial literacy than non-working. The determinants of financial literacy as drawn from the present analysis indicates that financial literacy is significantly influenced by education, woman's relationship with environment and informal economy such as her work situation, role in decision making and preparing household budget.

To sum up, the level of education among rural women is the most important socioeconomic determinant of sustainable rural development. Hence, equipping the rural women with formal education as well as technical skills would enhance their environmental; economic and social participation, which is acrucial aspect of sustainable development. The vulnerabilities of women of lower socioeconomic strata to lack of education, shortage of water& clean energy and to economic crisis must be addressed. The investments that energize local economies, provide environmental protection and disrupt social norms and behaviors that restricts the participation of rural women in workforce will lead to financial inclusion of women in the economic system of the Nation and therefore, a development of rural India for both - present and future generations.

References

1. Ahmed, S. (2016) Socio-economic Empowerment of Rural Women: An Overview. International Journal of Social Impact, 1(3), 33-45.
2. Bajwa, Harpreet. (2020, January 23). Punjab sounds alarm as water table recedes fast in 109 administrative blocks. *IndianExpress.*
3. Balakrishnan, K. (2013) Examining health effects of air pollution in India. New Delhi: ICMR Center for Advanced Research on Environmental Health,
4. Chakraborty, S.&Digal, S. (2011) A Study of Saving and Investment Behaviour of Individual Households-An Empirical Evidence from Orissa. Personal Finance & Investments (PF&I) 2011 Conference,
5. Chaturvedi, M. &Khare, S. (2012) Study of saving pattern and investment preferences of individual household in India.*International journal of research in commerce & management,* 3(5), 115-120.

6. Diamantopoulos, A.B., Schlegelmilch, B., Sinkovics, R.R. & Bohlen, G. (2003) Can sociodemographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation.*Journal of Business Research,* 56(6), 465-80.
7. Eriksson, A. C., Nordin, E. Z., Nyström, R., Pettersson, E., Swietlicki, E., Bergvall, C., …Pagels, J. H. (2014). Particulate PAH emissions from residential biomass combustion: time-resolved analysis with aerosol mass spectrometry. *Environmental Science & Technology*, *48*, 7143–7150.
8. Gakhar, D. (2019) Role of Optimism Bias and Risk Attitude on Investment Behaviour. Theoretical Economics Letters, 9, 852-871.
9. Gakhar, D.V.&Verma, B. (2020)Risk Attitude and Financial Awareness of Inter-Collegiate Athletes.*International Journal of Advanced Science and Technology,* 29(4s), 1098-1106.
10. Gakhar, D.V. &Prakash D. (2017) Investment Behaviour: A Study of Relationship between Investor Biases and Myers Briggs Type Indicator Personality.*OPUS HR Journal,*8(1), 32-60. ISSN- 0973-9866.
11. Gakhar, D. V., Prakash, D. (2013) A Study of Factors Affecting Investment Decisions: With Special Reference to Spiritual Intelligence.Edited book, Emerging Issues in Indian Financial Markets, Bloomsbury Publications.
12. GoI (2019)PradhanMantriUjjwalaYojana Achieves 6 Crore Mark; Hon'ble Vice President Hands over 6th Crore Connection to Beneficiary. Government of India, Press Information Bureau, 2 January.
13. Gupta, A., Vyas, S., Hathi, P., Khalid, N., Srivastav, N., Spears, D.,& Coffey, D. (2020) Persistence of Solid Fuel Use in Rural North India. Economic & Political Weekly, LV (3), 55-62.
14. Health Effects Institute (2020) State of Global Air 2020. Special Report. Boston, MA: Health Effects Institute. ISSN 2578-6873.
15. James, B.S., Shetty, R.S., Kamath, A., &Shetty, A. (2020) Household cooking fuel use and its health effects among rural women in southern India—A cross-sectional study. PLoS ONE 15(4): e0231757.
16. Kaur, S. (2016) Educational Status and Constraints of Rural Women in India: Evidence of Study from Rural Punjab, Research Journal of Social Sciences, 24 (3): 70-84. ISSN 025-348X
17. Leavey, A., Patel, S., Martinez, R., Mitroo, D., Fortenberry, C., Walker, M., …Biswas, P. (2017). Organic and inorganic speciation of particulate matter formed during different combustion phases in an improved cookstove. *Environmental Research*, *158*, 33–42.
18. Mohapatra, I., Das, S.C., &Samantaray, S. (2018) Health impact on women using solid cooking fuels in rural area of Cuttack district, Odisha. J Family Med Prim Care. 7:11–5. pmid:29915726.
19. Noda, S., &Bagai, A. (2020, October 27) Women at the Heart of Recovery.The Hindu,pp 7.
20. OECD INFE (2011) Measuring Financial Literacy: Core Questionnaire in *Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial literacy.* Paris: OECD.
21. Pate,l S., Leavy, A., Sheshadri, A., *et al*. (2018) Associations between Household Air Pollution and Reduced Lung Function in Women and Children in Southern India. J. ApplToxicol. 1-11,

22. Purohit, H.,&Dwivedi, M. (2015) Level of Awareness among Rural Women Regarding Financial Welfare Schemes: A Study of Tonk District.A working paper, BanasthaliVidyapith, CFPTRW.
23. Rao, S., Dahal, S.,Hadingham, S.,&Kumar, P.(2020) Dissemination Challenges of Liquefied Petroleum Gas in Rural India: Perspectives from the Field. Sustainability,12, 2327
24. Sen, A. (2000) Women's Agency and Social Change In Development As FreedomAlfredA.Knopf,Inc.,NewYork.
25. Smith, K. R. (2000) National Burden of Disease in India from Indoor Air Pollution. *Proceedings of the National Academy of Sciences*, 97(24), 13286–93.
26. Stanny, M., &Czarnecki, A., (2010)Level and determinants of sustainable rural development in the Region of Green Lungs of Poland. Rural Areas and Development, European Rural Development Network (ERDN), vol. 7, 1-16.
27. Verma, M., Shamsh, P., Manas, K., &Dipanjali, M. (2018) Domestic Use of Cooking Fuel in India: A Review on Emission Characteristics and Associated Health Concerns. Asian Journal of Chemistry, 30(2), 235-245