

## **Using Interpretive Structural Modeling to Determine the Relation between Youth and Sustainable Rural Development**

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### **ABSTRACT**

Youth can play a vital role in contributing towards sustainability. Challenges faced in the rural sector and constraints are identified in this study. The paper attempts to ascertain the relation between youth and rural sustainability. The major issue under investigation is to assess the contribution of youth towards rural growth and Prosperity. The researchers have done a Literature Review which is considered as a base for deriving the Variables for developing ISM Model. Interpretive Structural Modeling is an approach which drives the researchers to study various aspects and correlation between youth and rural sustainable development. The paper will reflect in understanding the various areas of youth contribution towards rural sustainable development in a hierarchical manner and highlighting the areas which needs immediate attention at every level. It is vital for the researchers to gain significant insights into relationship between youth and rural sustainable development.

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**Key words:** Interpretive Structural Modeling, Rural Sustainable Development, Youth

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### **Introduction**

Agriculture is the base for developing and rural economies and it is very vital to target sustainability for economic development and growth. Understanding the role of rural men and women is indispensable for rural development and sustainability. (Census Data)

The Indian youth today is anxious to participate in the onward march of sustainable growth. Communities and Societies need to have proactive men and women who can work as the social agents and bring positive development. Government needs to focus on formulating development policies which depict inclusiveness of youth properly addressed. Youth can change today and tomorrow with their knowledge, observation and action. Most young people grow up to become valued members of their communities, but for those who do not, the consequences personally and to society can be costly. Giving young people a sense of purpose, worth and achievement through how their actions make a difference, enabling young people to deal with unknown challenges is a must for sustainable growth.

### *Sustainable Development*

In the context of the definition of development, it is important to study the concept of sustainable development which is commonly used now a day. This term was highlighted as “Meeting the needs of the present generation without compromising on the needs of the future generations”(World Commission on Environment and Development)

### *Challenges for Rural Sustainable Development*

1. The utility of various types of organizations is dependent on the problems faced by the community (Michael and Rajendra Kumar 2008). The following areas have been identified as problems attributing to rural poverty:
2. There is limited access to natural resources in the rural areas
3. There exists a constant degradation of resources which results in lower agricultural productivity
4. The technologies used in the rural areas are outdated
5. Supply of critical inputs and finance is limited
6. Infrastructure and support services are poor and do not provide a strong support
7. Competent Management and managers are not available
8. There exists the problem of frequent failures which has resulted in chronic poverty and dependency on relief
9. Lack of confidence in themselves and others

The time is now ideal for a change in the strategy to bring about rural sustainability through youth. The rural development programme should assist in identifying the problems of the rural poor and address their local needs, instead of forcing them to accept pre-conceived plans. Rural families should be encouraged to take active part in the programme. Equal opportunities should be provided for youth to participate in Rural Sustainability. Programmes to facilitate sustainable management of natural resources and environmental protection and lead to better quality of life should be introduced.

### *Youth can contribute to rural sustainability in the following ways*

1. Bringing positive change by increasing productivity in the agricultural sector and by taking measures to develop rural areas for the betterment in the field of education, innovation, gender equity and infrastructural development.
2. Using their education for the good of the country.
3. Young people need to be the activist for rural sustainability.
4. Young people need to develop a sense of purpose, worth and achievement through showing how their actions make a difference.

It is very important for our nation to enable young people to deal with unknown challenges as they arise, through improving their mental and physical health, and the way they behave.

### **Objectives**

1. To highlight how youth can contribute to rural sustainable development.
2. To establish correlation between youth and rural sustainable developments

### **Literature Review**

#### *Approaches adopted for Literature Review*

A structured systematic literature review (as proposed by Tranfield et al, 2003) has been adopted using Ebsco, Emerald, Scopus, Jstor, Thomson Reuters and Google Scholar; as well as secondary data from books, articles that aid the study of Sustainable Development. The contributive variables of youth and sustainability have been collected and assimilated for further utilization of ISM methodology. Seminal articles directly related with the research topic have not been found, since the area is relatively novel. Synthesis of review identified research gaps, whereby it was noticed that almost no academic work was done in the area of image management, probably because it is a newer concept. However, work has been done in some related elements. The research shall probably be able to close the visible academic gap.

#### *Identification of Variables*

A variable is a characteristic that is measurable and has amplitude, intensity or both. The variables identified in the research have been drawn out of the systematic literature review. These emerged single or multiple times in the search. The bias in identification or selection was obviated, since even a single meaningful mention of a variable was given credence; which was validated by practicing image consultants through personal interaction or electronic mail or telephone. The variables thus identified which are believed to be the core variables towards youth and sustainability are as follows:

**Table 1:** Systematic Literature Review

Sr.No.	Factors	Reference
1.	Rural Youth Activism	S. E. Kreps <sup>ab</sup> , E. Mariéthoz <sup>ac</sup> , M. Bakonyi <sup>c</sup> & B. S. Polla <sup>acd</sup> , 2009; Jean J. Schensul, 2009; Pittman, Karen, 1991; Berardi, U. (2013); Blyth, Dale A. and Eugene C. Roehkepartain 1993;
2.	Positive Rural Youth Development	N.G. Hegde, 2005; Tenibiaje Dele Joseph, 2012; Hal A. Lawson, 2010; Bird, et al, 1978; Bernard, Bonnie 1991; Coleman, James 1972; Combs, J.W. 1981; Mosher (1979); Muss, 1982 Crain, 1985
3.	Rural Youth Education	Svenson, Gary Burke and Holly, 2009; Daniella Tilbury, 2010; Alexandra Ryan, Daniella Tilbury, Peter Blaze Corcoran et al, 2010; Greenberg, Mark T. et al, 2003; Foster, John 2001; Huckle, J., & Sterling, S. R. (Eds.). (1996); Tilbury, D. (1995); Combs, 1981; McCloskey and Kleinbard, 1974; Sprinthall and Mosher, 1979
4.	Rural Young Leaders	Tommaso Minola, Giuseppe Criaco and Lucio Cassia, 2014; Cisek, James, and Anthea George, 1985; Gobeli, Virginia C., 1988; Sarah E.A. Dixon, Anne Clifford, (2007); Bennett, S. (1991); Berle, G. (1991) Venus Talwar, Kavita Puri, (March 2013) ; Alistair R. Anderson, (1998); Anderson, A. R. (1998); Isaak, R. (1998)
5.	Rural Youth contribution to Environment	N.G Hegde, 2002; Peter Hess, 2010; Kristen Magis; Sue Kilpatrick, John Field And Ian Falk, 2013; Berardi, U. (2013); Beringer, A. (2006); Fien, John, and Daniella Tilbury 2002; Tania M. Schusler et al 2010

Source: Primary Data

*Rural Youth Activism:* A study has shown that positive indications of individual sustainable development and successful ageing can represent potential threats to the success of global sustainable development. An analysis of the recent ageing trends, by discussing individual and global sustainable development has been conducted. The results of which show that there exists intergenerational tensions and potential conflict between individual and global sustainable development. (S. E. Kreps et al)

Dynamic systems approach has found an inter relation between the following: science, community, culture, and sustainability. These concepts are important in community based participatory research and to the targeting, refinement, and adaptation of enduring interventions. (Jean J. Schensul). In order to promote rural sustainable development youth should come forward and actively participate (Berardi 2013)

Youth should be actively involved in problem identification and program design of sustainability as they understand the needs of their peers and can identify means to reach them effectively. Youth problems that arise as a result of their developmental needs unmet. A "ladder" (R. Hart, 1992) of youth participation has eight levels which can be highlighted as follows: manipulation; decoration; tokenism; assigned but informed; young people consulted and informed; adult-initiated, shared decisions with young people; young person-initiated and directed; and young person-initiated, shared decisions. (Kothari, Roshani)

Youth development is the process of enhancing and developing one's capacities in positive ways. It is an "ongoing and inevitable process in which all youth are engaged and all youth are invested." (Pittman, 1991).

*Positive Rural Youth Development:* Youth development has been derived from Mosher's (1979) the definition of developmental education as "Developmental education is education of the person which stimulates cognitive , intellectual growth, emotional growth, moral reasoning and action, social skills, aesthetic development ,vocational competencies, and a sound body."

There are a variety of relationships that young people are exposed in order to provide opportunities for modeling and observational learning. Both of which are relevant to learning complex social behaviors of youth and analyzing their basic perceptual-motor skills (Muss, 1982). Youth can learn better through example and experience (Crain, 1985).

Learning is a social setting and includes the relationship between the attitudes and behavior of both the adult and young person (Kohl, 1982) which eventually contributes to development. The aim of Positive youth development is to provide an environment where youth can become empowered through the acquisition and development of skills that help in expanding their personal resources. Positive Youth Development provides opportunities for taking up activities and responsibilities that affect others. These responsibilities move youth towards a mutually responsible and mutually rewarding involvement with others that subsequently results in social maturity (Coleman, 1972).

Consequently, youth development is directly related to freedom of choice when freedom is defined as the number of options available to youth and their right to express them. (Bird et al, 1978; Bandura, 1966; Cisek and George, 1985; Pittman, 1990, 1991)

*Rural Youth Education:* In this current era of school reform, educators are being held accountable for the academic achievement of minority and poor students (Benard 1991). The relation between education and sustainability cannot be an external, still less an instrumental one. Sustainability means humans, as individuals and societies, consciously trying to go with the grain of nature. (Foster, John 2001)

In order to design a Responsive and relevant curriculum and implement the same, recognition of the individual uniqueness and their different needs, interests and abilities is necessary (Combs, 1981; McCloskey and Kleinbard, 1974; Sprinthall and Mosher, 1979)

Youth peer education (YPE) is a widely used approach to reproductive health promotion and HIV prevention, and the number of YPE programs globally continues to grow. (Stevenson et al 2009)

A close connection can be established between the changing concerns about the environment its associated problems and the way in which environmental education is defined and promoted. The areas of environmental concerns are a current topic which is emphasized on in education. The new focus of environmental education is different from the conventional approaches. (Daniella Tilbury, 2010)

The Asia-Pacific region has offered many creative initiatives and has shown considerable progress in ESD and in understanding the learning dimensions of sustainability. At the same time, Youth mirrors the global trends in which further work is needed to promote systemic change in educational arenas, specifically in terms of strategic integration within institutions. ( Ryan et al, 2010)

*Rural Young Leaders:* There exist many differences between the rural youth and older leaders. The youth leaders are different in several areas such as accumulation of resources and skills; psychological, cognitive and motivational attributes; and reaction to influences from the environment, culture and norms. There exist many promising avenues for future research and there is a need to formulate policies in the field of youth entrepreneurship (Tommaso Minola et al)

A strong link has been identified between entrepreneurialism and environmentalism. Various models have been derived based on this link. One such model is the Green-Works business model stems that from the business's symbiotic relationships between the following: firstly with large corporate bodies, that are keen to quantify their Corporate Social Responsibility efforts; secondly, with the existing community and various social partners, who provide employment and training for disadvantaged people and a route to relatively risk free growth; and thirdly, with government and social institutions, that are responsible for providing special concessions and support to promote rural young leaders.

Attitude plays a major role in understanding Environmentalism; the term cannot be understood in purely economic terms because of the power of the moral dimension. Entrepreneurship is primarily an individualistic economic action, but it too can be driven by moral attitudes. Alistair R. Anderson, (1998)

In a market system, sustainable development requires sustainability innovation and entrepreneurs. The combination of the two can help to achieve environmental and social goals with superior products or processes that are successful in the marketplace. This can also contribute in solving related environmental problems and helps create an economic value. Manufacturers can generate new products, services, techniques and organizational modes which substantially reduce environmental impacts and increase the quality of life. (Stefan Schaltegger & Marcus Wagner)

*Rural Youth s contribution to the Environment:* The World Bank, two decades ago had declared a goal to achieve sustained and equitable development to be the greatest challenge facing the human race. An index of youth investment (IYI) has been proposed to highlight children and the intergenerational dimension of sustainable development. This index incorporates quality-adjusted measures for child health and education. (Peter Hess, 2010)

A so understand study was conducted to understand the contribution of youth in local environmental action, as well as the experiences of some of the youth involved. Environmental action is a very valuable context for obtaining rural sustainable development. (Tania M. Schusler et al 2010)

**Table 2: ISM Reference Table (Variable Identification from Literature Review)**

Sr.No.	Factors	Variables	Reference
1.	Rural Youth Activism	V1	S. E. Kreps <sup>ab</sup> , E. Mariéthoz <sup>ac</sup> , M. Bakonyi <sup>c</sup> & B. S. Polla <sup>acd</sup> ,2009; Jean J. Schensul,2009; Pittman, Karen,1991; Berardi, U. (2013); Blyth, Dale A. and Eugene C. Roehkepartain 1993;
2.	Positive Rural Youth Development	V2	N.G. Hegde,2005,Tenibiaje Dele Joseph,2012; Hal A. Lawson,2010; Bird, et al,1978; Bernard, Bonnie 1991; Coleman, James 1972; Combs, J.W. 1981; Mosher (1979); Muss, 1982 Crain, 1985;
3.	Rural Youth Education	V3	Svenson, Gary Burke and Holly, 2009; DaniellaTilbury, 2010; Alexandra Ryan, DaniellaTilbury, Peter Blaze Corcoran et al,2010; Greenber e,2003; Foster, John 2001; Huckle, J., & Sterling, S. R. (Eds.). (1996); Tilbury, D. (1995); Combs, 1981; McCloskey et al 1974; Sprinthall and Mosher, 1979
4.	Rural Young Leaders	V4	Tommaso Minola, Giuseppe Criaco and Lucio Cassia, 2014; Cisek, James, and Anthea George,1985; Gobeli, Virginia C.,1988; Sarah E.A. Dixon, Anne Clifford, (2007);Bennett, S. (1991);Berle, G. (1991)Venus Talwar,Kavita Puri,(March 2013) ;Alistair R. Anderson, (1998);Anderson, A. R. (1998);Isaak, R. (1998)
5.	Rural Youth's contribution to Environment	V5	N.G Hegde,2002 ,Peter Hess, 2010;Kristen Magis;Sue Kilpatrick,John Field And Ian Falk,2013; Berardi, U. (2013); Beringer, A. (2006); Fien, John, and Daniella Tilbury 2002; Tania M. Schusler et al 2010

Source: Primary Data

### Research Methodology

This study is based on Systematic Literature Review. The secondary data in this research was collected from research books, journals and web sites. For the study the researcher had decided to follow a quantitative approach and therefore the research methodology included a theoretical study, a survey and an empirical study.



### *ISM Modeling*

Interpretive Structural Modeling (ISM) enables the individual or a group of them to manage the interrelations between two or more elements at a time without compromising and deviating from the actual properties of the original elements/issues [Morgado et al. 1999]. ISM provides a framework for delineation of a hierarchy amongst variables, influencers or elements of any project under consideration [Warfield 1974; Sage 1977]. This kind of modeling is seen as a useful tool that helps logical thinking and carefully approaching complex issues and then communicating the results of that thinking to others. ISM is much more flexible than many conventional quantitative modeling approaches that require variables to be measured on ratio scales. It offers a qualitative modeling language for structuring complexity and thinking on an issue by building an agreed structural model [Morgado et al. 1999]. ISM is structural as it extracts hierarchy form a different combination of variables. It has a mathematical foundation, philosophical basis and a conceptual and analytical

### *Research Design*

Following is the process involved in ISM:

- a) Identify and list elements/variables relevant to the factors contribution for sustainability by rural youth under consideration, through a literature review.
- b) A SSIM is developed to indicate a relationship between variables undertaken.
- c) Convert the SSIM developed into a reach ability matrix.
- d) The next step is to then test the transitivity (if A depends on B and B depends on C, then by principle of transitivity, A depends on C), make modifications to satisfy the transitivity requirements and derive the final reachability matrix.
- e) Model levels are derived by iterative partitioning of the reach ability matrix.
- f) Translate the relationships of reachability matrix into a diagraph and convert it into an ISM (Interpretive Structural Model).
- g) The model is then reviewed for inconsistencies the model for conceptual inconsistencies and revised accordingly.

*Structural Self Interaction Matrix (SSIM) Table1:* For development of the SSIM, ISM methodology suggests that experts' views are used for defining contextual relationship among variables, in line with objectives of the study. In this research, entire list of rural youth contributing factors for sustainability entified from literature review was presented to a group of participants Group was explained the background of study and was asked to deliberate

whether the list of eleven barriers/hurdles and eleven enablers/drivers adequately covered all factors influencing m-banking or there was a need to include any other factor(s).

**Table 3: SSIM Matrix**

i j → ↓	V5	V4	V3	V2	V1
V1	V	A	A	X	
V2	V	X	A		
V3	X	V			
V4	V				
V5					

The following 4 symbols(V,A,X,O) are used to indicate the direction of relationship based on dependence between 2 factors(i and j).The following 4 possibilities is considered for making table 1 of SSIM.

$i \longrightarrow j \xrightarrow{\text{red arrow}}$  If that is true, the relationship is symbolized as V.  
 $j \not\longrightarrow i$

$i \not\longrightarrow j \xrightarrow{\text{red arrow}}$  If that is true, the relationship is symbolized as A.  
 $j \longrightarrow i$

$i \longrightarrow j \xrightarrow{\text{red arrow}}$  If that is true, the relationship is symbolized as X.  
 $j \longrightarrow i$

$i \not\longrightarrow j \xrightarrow{\text{red arrow}}$  If that is true, the relationship is symbolized as O.  
 $j \not\longrightarrow i$

*Reachability Matrix:* The next step is to convert the matrix into binary matrices called initial reachability matrices. This is done by replacing V, A, X and O by One and Zero in accordance with the VAXO rules. The following has been followed to derive the binary matrix:

If the entry of (i,j) in the SSIM is ‘V’, then enter the value of the element (i,j) as ‘1’ and subsequently (j. i) as ‘0’ in initial reachability matrix

If the entry of (i,j) in the SSIM is ‘A’, then enter the value of the element (i,j) as ‘0’ and subsequently (j. i) as ‘1’ in initial reachability matrix

If the entry of (i,j) in the SSIM is 'X', then enter the value of the element (i,j) as '1' and subsequently (j. i) as '1' in initial reachability matrix

Finally, if the entry of (i,j) in SSIM is 'O', then enter the value of the element (i,j) as '0' and subsequently (j. i) as '0' in the initial reachability matrix.

**Table 4:** Reachability Matrix

<b>i J →</b> <b>↓</b>	<b>V1</b>	<b>V2</b>	<b>V3</b>	<b>V4</b>	<b>V5</b>	<b>Driving Variables</b>
<b>V1</b>	1	1	0	0	1	<b>3</b>
<b>V2</b>	1	1	0	1	1	<b>4</b>
<b>V3</b>	1	1	1	1	1	<b>5</b>
<b>V4</b>	1	1	0	1	1	<b>4</b>
<b>V5</b>	0	0	1	0	1	<b>2</b>
<b>Dependent Variable</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>5</b>	

*Level Partitioning:* The final reachability matrix obtained after completing the transitivity requirements based on the relation mentioned above is used for level partitioning. It involves comparing the 'reachability' and 'antecedent' sets of variables and delineating levels on the basis of intersection sets. It leads to arriving at a reachability set for a variable by considering the variable with itself along with other set of variables that causes an impact. The antecedent set comprises of comparing the variable and a set of all those variables that have an impact on the primary variable. The hierarchy in ISM is decided by the level of similarity in reachability and intersection sets (Table 6). These variables would not impact any other variables.

**Table 5:** Level 1 identification

<b>i J →</b> <b>↓</b>	<b>Reachability Set</b>	<b>Antecedent Set</b>	<b>RS ∩ AS</b>	<b>Level</b>
<b>V1</b>	1,2,5	1,2,3,4	1,2	
<b>V2</b>	1,2,4,5	1,2,3,4	1,2,4	
<b>V3</b>	1,2,3,4,5	3,5	3,5	
<b>V4</b>	1,2,4,5	2,3,4	2,4	
<b>V5</b>	3,5	1,2,3,4,5	3,5	

Level 1 is Positive Rural Youth Development (V2)

**Table 6:** Level 2 identification

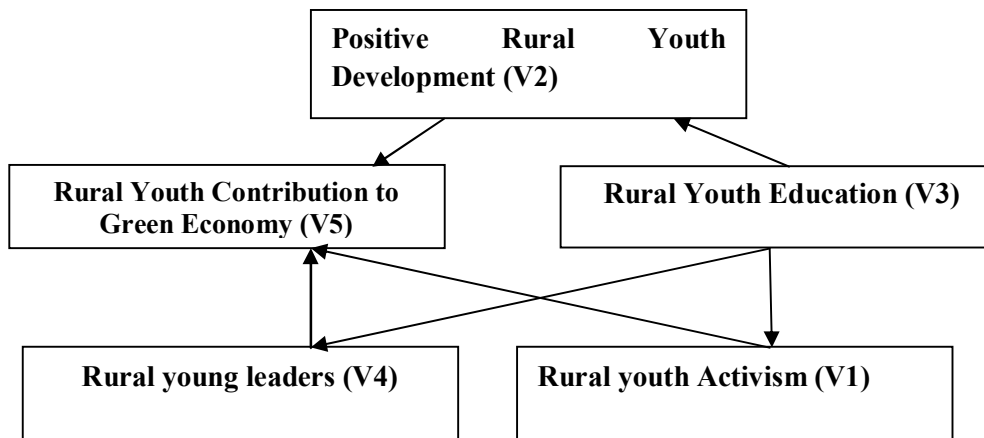
$i \downarrow j \rightarrow$	Reachability Set	Antecedent Set	$RS \cap AS$	Level
V1	1,6	1,3,4	1	
V3	1,3,4,6	3,6	3,6	
V4	1,4,6	3,4	4	
V6	3,6	1,3,4,6	3,6	

Level 2 has been identified as Education (V3)

**Table 7:** Level 3 identification

$i \downarrow j \rightarrow$	Reachability Set	Antecedent Set	$RS \cap AS$	Level
V1	1	1,4	1	
V4	1,4	4	4	

Level 3 will be rural young leaders (V4) and rural youth Activism (V1)



**Figure 1:** Model depicting relation between variables based on ISM

**MICMAC Analysis**

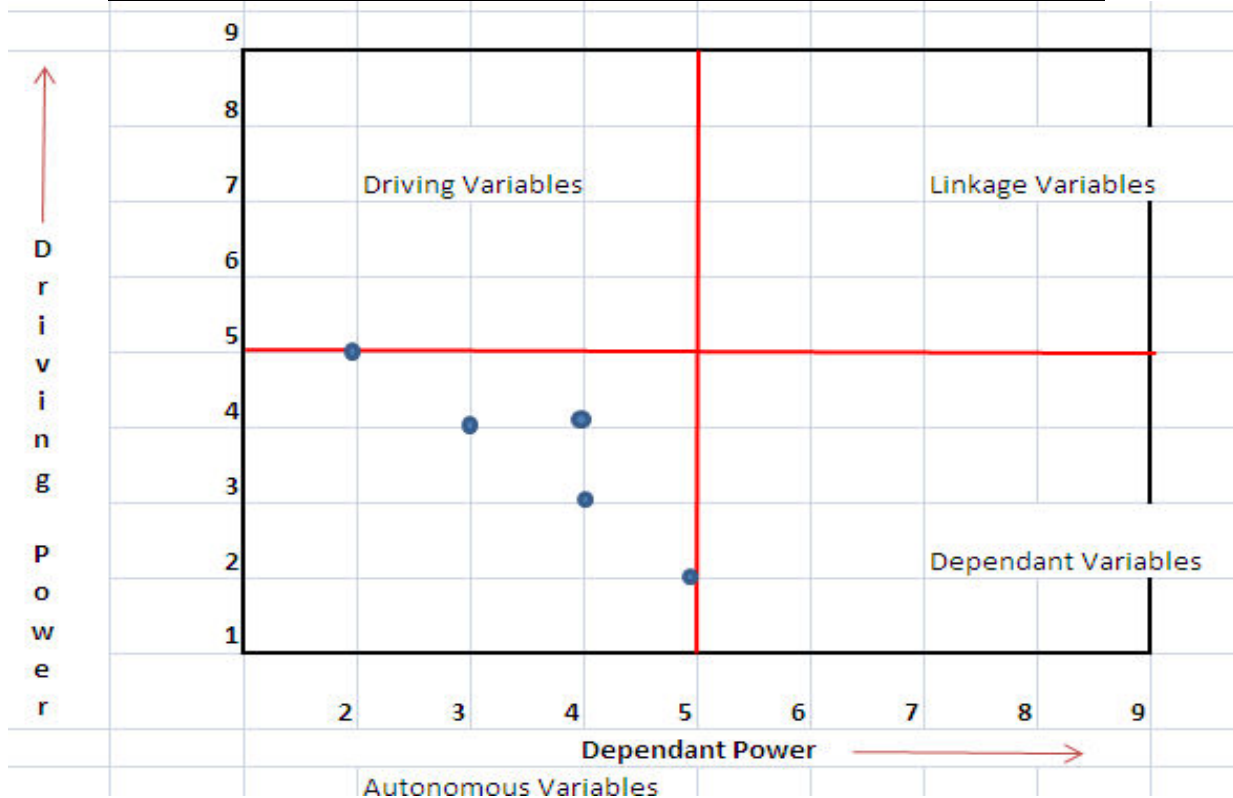
MICMAC is used to examine the Driving Power and Dependence Power of the variables. The variables have been classified into four categories called as Autonomous, Linkage, Dependent and Driving variables. The following is the meaning of the 4 categories:-

1. Autonomous Variable: This indicates a weak driving power and subsequently a weak dependence power. The variables are disconnected from the system.

2. Linkage Variable: This indicates a strong driving and strong dependence power. The factors are unstable; any action on these variables will have an effect on others and a feedback effect on themselves.
3. Dependent Variable: This indicates a weak driving power but strong dependence power. Any action on them will have an effect on others and also feedback effect on themselves.
4. Driving Variable: This indicates a strong driving power but weak dependence power.

**Table 7:** Driving and Dependant Variables for MICMAC Analysis

Factors	Variables	Driving Variables	Dependant Variables
Rural youth Activism	V1	3	4
Positive Rural Youth Development	V2	4	4
Rural Youth Education	V3	5	2
Rural young leaders	V4	4	3
Rural Youth Contribution to Green Economy	V5	2	5



**Graph 1:** Graph of MICMAC Analysis

**Conclusion**

The conclusion drawn from the ISM Hierarchy shows high interrelationship and interconnectivity between the rural youth and sustainability. The conceptual framework

reconciles the contribution of rural youth in various ways towards sustainability. The analysis is based on a Literature review and ISM modeling.

#### *Limitations*

The research limits itself to the deduction and understanding of the concept of rural youth contribution towards sustainability and its core elements; however it does not probe the nitty-gritty's of the elements at a microscopic level. This may possibly limit the detailed understanding of the concepts of each core element at the infinitesimal level. Our study only talks about the core relation between rural youth and sustainability. Our model includes factors at Macro Level.

#### *Further Research Directions*

The limitations of our present study can further be extended in future. The future research directions are outlined as:

There is a need for sustainable framework with young minds and challenges. The present study needs to be further investigated under the light of economic dimensions and issues.

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