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# Study on Carbon Neutrality in Sukhwara Village Udaipur

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**ABSTRACT:** This report gives an insight on how to achieve carbon neutrality on villages by implementing certain interventions. The study was conducted in Sukhwara Village, Udaipur district in Rajasthan and gives you an idea about why it is important to concentrate on villages for achieving carbon neutrality. As villages are the least concerned place for the government authorities and the people living there have less idea on how to mitigate carbon emissions. The place I selected was Sukhwara Village where people have a wide variety of farming and every household has a livestock as their daily livelihood. There are just a few real-world examples of carbon-neutral or carbon-negative communities or civilizations, but there is a wealth of information available on these concepts as well as several strategies for reducing emissions sources and improving GHG sinks. It is necessary to explain carbon neutrality in the form of a conceptual framework so that all of its ideas can be examined and applied with objectivity. The current article offers a conceptual framework for achieving carbon neutrality, which is a simplification of reality that ignores the complexity of social, economic, and natural systems and how they interact.

**KEYWORDS :** Carbon Neutrality, Carbon footprint, Climate Change action.

## I. INTRODUCTION

Since the Industrial Revolution, excessive usage of natural resources has significantly impeded human progress. Human activities have led to the steadily rising levels of carbon dioxide and other greenhouse gases (GHGs) in the environment, which are causing global climate change. These activities include the excessive use of petroleum and coal, deforestation, and other sorts of land-use change. The most important goal on Earth is to achieve zero emissions of carbon by 2050 due to the worsening effects of global climate change. Reforming the current manufacturing procedures in order to lower GHG emissions and encourage CO<sub>2</sub> uptake by the environment is therefore crucial and a significant challenge. In this article, cutting-edge technologies for achieving carbon neutrality and sustainable development are examined, including the production of renewable energy, transformation of the food system, waste valorisation, C sink conservation, and C-negative manufacturing. The abundance of information shared in this assessment has the potential to motivate the creation of new, cutting-edge technology to slow climate change and sustainably support human activities. Overconsumption of non-renewable energy sources worsens environmental degradation, climate change, greenhouse gas emissions, and energy scarcity, all of which pose risks to humankind. As a result, humankind's ecological consciousness and the switch to low- or no-C energy are more pressing issues now than they have ever been. To address those issues, a number of policies have been created on a global level.

## II. REVIEW OF LITERATURE

### 2.1] Curbing Carbon Neutrality And Climate Change

The average atmospheric CO<sub>2</sub> concentration on a global scale increased significantly from its preindustrial level of 285 ppm around 1850 to 415 ppm by 2020. Even if we immediately eliminate carbon production, the Earth will continue to warm because the extra CO<sub>2</sub> in the atmosphere continues to have a greenhouse effect. To achieve carbon neutrality by 2050, the temperature rise from preindustrial levels by 2100 must be kept to 1.5–2.0°C. All nations must make enormous efforts to do this. In light of the hazardous climate change that could endanger our species' very existence on Earth, these could be seen as desperate endeavours. Sea-level rise, in my opinion, is a very dangerous problem that might potentially

endanger more than 100 million people in this century and significantly more in the long run. The temperature has fluctuated by around 10C over the course of Earth's history, whereas the sea level has varied by about 200m, meaning that the sensitivity is 20m per C.

Around 20,000 years ago, during the last glacial maximum, the temperature was about 6C lower and the mean level of sea 125 m lower. Despite a 1.2C increase in Earth's surface temperature since the preindustrial era. The fifth industrial revolution could be brought about by carbon neutrality, following the first four. The first got underway around 1750 and gained momentum after James Watt's steam engines were successfully used in 1785 to power significant businesses. The second emerged around 1850 as a result of the widespread adoption of electrically driven machinery and production lines that considerably raised industrial productivity following Benjamin Franklin's 1732 discovery of electricity. The third computer followed shortly after. After the creation of the first global web, the fourth gradually evolved. The absence of proactive responses to climate change forces the planet to deal with the dire effects of ecological deterioration and environmental fragility.

## 2.2] Carbon Neutrality

There has been a significant increase in carbon emissions in recent years, and threats posed due to these have been increasing at an alarming rate. Carbon emissions from fossil fuels contribute to most of the environmental problems coupled with greenhouse gas emissions. India stands at fourth position globally in terms of carbon emissions. China, the USA, India, and Russia are the top carbon emitters. The faulty land use mechanisms have posed severe cascading effects with respect to carbon emissions. Proper land use mechanisms help in creating a carbon sink by absorbing most of the carbon dioxide. The covid 19 pandemic acted as a boon in cutting down carbon emissions due to minimal use of vehicles. Apart from fossil fuel combustion, vehicular emissions also contribute to carbon emissions. The cement factory also contributes to severe carbon emissions, so it becomes necessary to curb this. Carbon capturing is a method that's done to cut down carbon emissions. This technique helps in removing emissions directly from air, and this captured air is compressed as a liquid or solid. This captured carbon gets combined with green hydrogen that helps in the formation of climate neutral methanol and can be transported to industries to use as fertilizers. Carbon dioxide can't be limited to just a greenhouse gas. Instead, it acts as a feedstock to produce cleaner fuels in the future. Direct Air Capture technology is a technique that can remove carbon dioxide directly from the atmosphere. India needs to expand its resources to incorporate such vibrant technology due to its high cost. Carbon Capture, Utilization, and Storage is a mechanism adopted to achieve carbon neutrality by 2030.

It is important to develop more technologies with respect to carbon sequestration. The various carbon sequestration methods include terrestrial, geologic, ocean, natural, and artificial carbon sequestration in order to fight the menace called climate change. The SDG 13 focuses on taking serious action with respect to climate change, and this is in sync with carbon sequestration.

## 2.3] Site Of Study

The site of study selected was Sukhwara village of Udaipur district in Rajasthan where the population of village is around 1280 people. The main community belonging to Sukhwara village are Rajputs which are dominant caste and have land of their own for agriculture, also inside the interiors of Sukhwara village have a wide variety of sub communities like Regar, Raigar, Ramdasia of the Mehar community and they mostly depend on cattle rearing and goat farming. Since Rajasthan is a state where high on milk production all the communities invest their time and money on cow and goat farming. The village individually have their own dairy unit which give supply to the main dairy booths in Rajasthan. The Regar and Rajgar community have very less dominance in the village so most of them don't have their own land for agricultural purpose and depend mostly on cattle rearing. The area which was given to me for survey was around 60 household and most of them belong to the Rajput community and around 15 houses belong to the Rajgar community which solely depend on cattle rearing. After having a proper face to face interaction with the house members I came to an understanding that none of the household have proper toilet facilities.

As the village have very high releasing of carbon content the task was quite hideous and challenging to implement interventions. All the houses have traditional chulha which emits more carbon and requires a lot of firewood which again diminishes the green cover and is harmful for the women who mainly depend on cooking purpose. So the ICICI Foundation has implemented certain freebies based on each house usage of firewood in use and the amount of livestock manure they produce. Certain products like smokeless chulha and ACC vermibed for preparing manure has been given to 60 household.



### III. RESEARCH METHODOLOGIES

#### 3.1] Research Design And Approach

This research was conducted to analyse the Carbon emissions in villages and how to curb carbon emissions in various ways so as to give a better tomorrow. Also this research gives an idea on how effective interventions can be implemented to mitigate carbon emissions. Also gives an idea on how these interventions are implemented by ICICI foundation by giving freebies to the village people that can curb the carbon emission. Hence, the design based on the objectives of the study is exploratory and descriptive in nature. The research has used the qualitative research methodology based on the research design.

#### 3.2] Data collection

##### 3.2.1] Sampling

Purposive sampling has been used whereby 60 households have been participated of age group 18-70 were interviewed. Two main members from each of the household have been selected to give an accurate idea about the vehicle usage, current consumption and the total amount of firewood being used for cooking purpose.

##### 3.2.2] Primary And Secondary Sources

To conduct this research, researcher will use two kinds of tools for data collection – observation guide and semi-structured interview as primary data sources. Secondary data sources will be collected from journals articles, online sources, books, etc. Secondary data sources will also include reports, case-sheets, policy documents and other journals.

##### 3.2.3] Methods And Tools

###### 1] In-depth interview

The in-depth interviews were conducted - face to face - considering the nature of the study and setting. Semi-structured interview guide was used to conduct interviews with the village people, thus allowing scope for probing questions. The interview guide also gives better understanding about their lives, way of living and livelihood.

###### 2] Observations

During the data collection process, it helps to observe that the village people of Sukhwara village have very less idea about carbon neutrality. All the members in that village are depending on agriculture and cattle farming as their primary source of income, so a large amount of cattle feed waste is being disposed in the road side areas which is again another source of carbon emission.

### IV. DATA ANALYSIS

#### 4.1] Income And Occupation

Almost 95 percent of village people in Sukhwara village rely on agriculture and cattle farming as their main source of income, the rest 5 percent rely on other source of income. People have more priorities to their agricultural land than their own growth, people put all their saving into agriculture and cattle farming so that they can rely for a sure source of income. Farmers now rely on private funding considerably more because of the State's disengagement. The main income of village people is cattle farming and agri business. Which holds around 9 percent and 6 percent respectively. The other main source of income is cattle rearing poultry farming, sale of livestock feed and carpentry. So from the analysis review I understood people of Sukhwara mainly rely on agriculture and cattle farming as their main source of income. A specific questionnaire was used to perform an investigation utilising the interview approach. They include agricultural labourers, small-scale, marginal, large-scale, and various types of farmers. The study focuses primarily on the distribution of land ownership, agricultural output, loan details, including information about income and expenses and livestock, as well as general knowledge, etc.

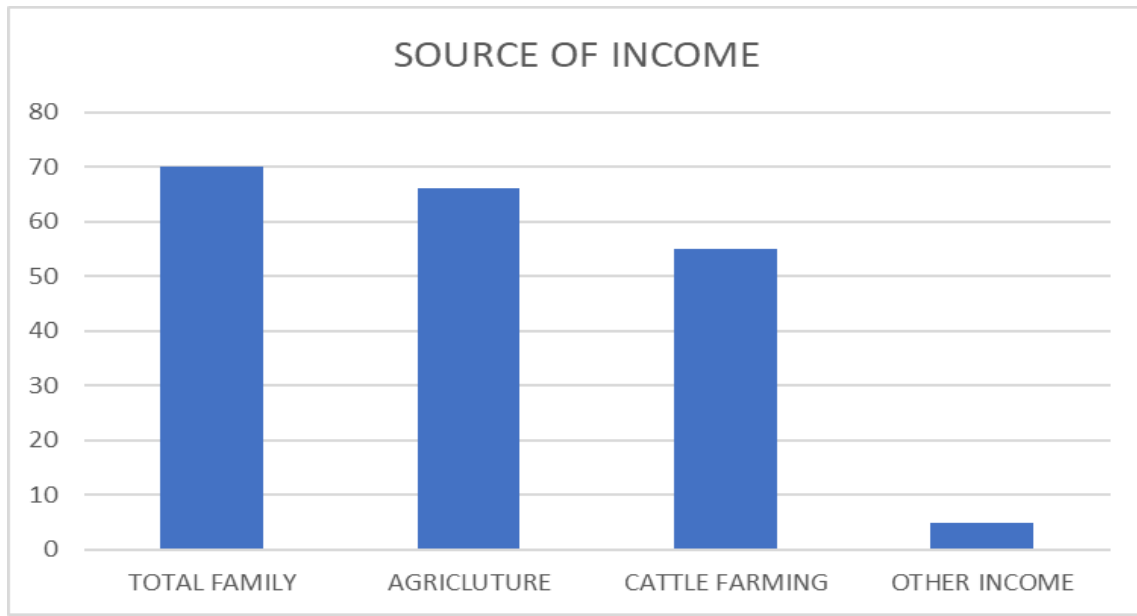


Figure 1: Source of income

**4.2] Literacy Rate**

The literacy rate of Sukhwara village as a whole only 3 percent have an upper educational qualification, rest of the people have better knowledge in agricultural practises and cattle farming, they inner thought is also there is no need of education as their primary valuation is agriculture and farming. So each and every village people including small children have a basic idea about the crop cultivation and the season of harvesting etc. Improvements in rural farm-centric infrastructure, financial support for farming and services for extension, and a focus on research are mentioned as potential solutions to the country's current rural misery.

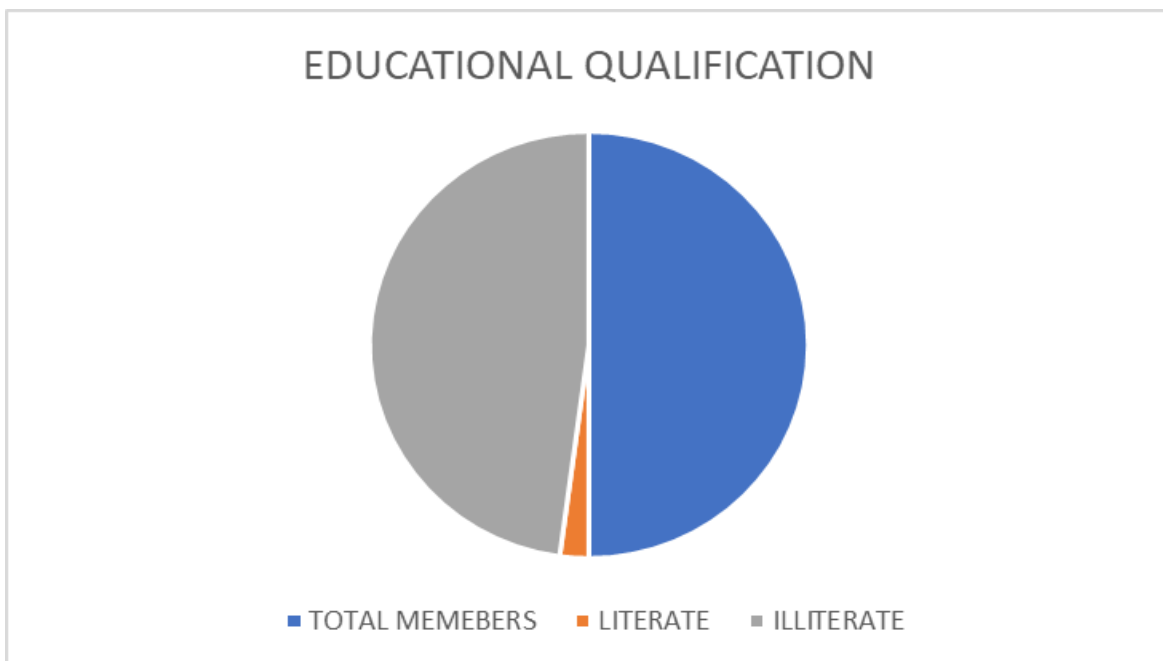


Figure 2 : Educational Qualification



**4.3] Social Structure**

To understand more about the background of each people in Sukhwara village, the people have been divided based on their community. Almost all the people depend on agriculture and cattle farming as their daily livelihood, after surveying I came to realise that many people don't know the idea behind carbon neutrality, so I made sure that each and every individual of Sukhwara village take part in the ratrichopal happening every weekend and the foundation gave a video lecture to the people on what exactly the organisation is going to make for them. As all the village people have very less education qualification they tend to stick in the community itself and have very less knowledge about what is happening outside the village. And all the people have an emotional bond between them as I could see from how they explain about the facility they are getting from the neighbourhood.

**4.4] Energy Consumption And Transportation**

Rural areas have seen an increase in the use of fossil fuels as well. The economic impact of non-local goods and services as well as population migration for a variety of jobs have resulted into an increase in fuel consumption and vehicle density. Electricity emissions have only been taken into account at the point of consumption or end use (home and irrigation), not at the point of generation (thermal power plants, etc. Most of the electrified rural households use electricity for lighting and air circulation, but less than half use it for entertainment and less than a fifth use it for medium to high-power appliances such as a refrigerators, irons, and mixer-grinders.

Apart from socioeconomic characteristics, a key predictor of rural electricity demand is hours of supply in Sukhwara village. Access to reliable and longer hours of electricity supply is correlated to higher adoption of grid-electricity. Basic data from the survey includes things like the name of the head of household, the number of households, the age of the head of household, the existence of a side business that is not agriculture, etc. A design sample survey is used to perform the thematic survey on energy usage and consumption. Transportation in Sukhwara village is at medium level but the usage of diesel vehicles is at higher on demand as most of the agricultural vehicles like truck and tractors are diesel. Each house the usage of transportation is of around 20-40 km daily, which considerably higher compared to a normal village. The usage of vehicle per house on a daily bases is more compared to a normal village. Since each household member travels around 40 km per day for various purpose the emission level is at an alarming rate also the fuel consumption is also high as in the bar graph shown each vehicle.

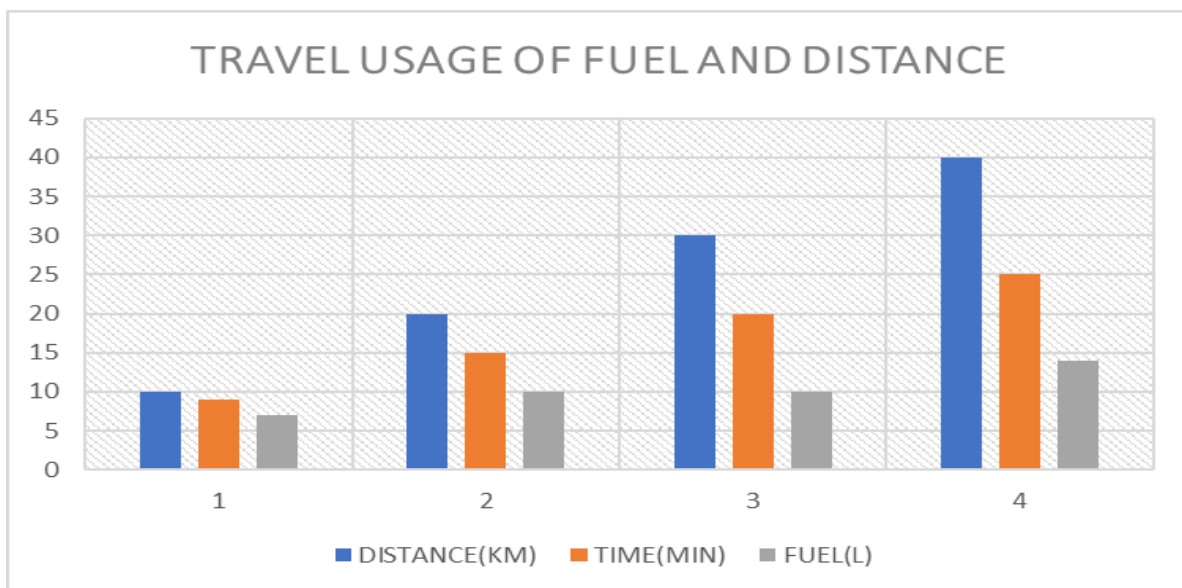


Figure 3: Travel usage of fuel and distance



## V. CONCLUSION

The methods and tactics outlined for creating carbon-neutral clusters are neither exhaustive nor complete. They serve as useful starting points for discussions that will lead to the development of a specific plan. We must do pilot studies to test them. Small-scale experiments conducted in various ecosystems and cultures are required to support many such approaches; based on the results, the frameworks can subsequently be enhanced. One of the most crucial components to the continued survival of life on Earth is carbon. The exploitation of C-based resources to create energy, food, and other commodities since the Industrial Revolution has had a significant impact on the world's ecosystems. Global climate change is a result of the greenhouse effect brought on by a rise in atmospheric CO<sub>2</sub> and other GHGs, which is exacerbated by extensive use of fossil fuels, deforestation, and anthropogenic activity. The world community is currently challenged with coming up with affordable and sustainable strategies for reducing carbon emissions and encouraging carbon sequestration.

## REFERENCES

- 1] Maxwell, T. J. & Cannell, M. G. R. (2000) The environment and land use of the future, in: G. Holmes & R. Crofts (Eds) *Scotland's Environment: the Future*, pp. 30–51 (East Linton: Tuckwell Press).
- 2] Chambers, N., Simmons, C. & Wackernagel, M. (2000) *Sharing Nature's Interest: Ecological Footprints as an Indicator of Sustainability* (London: Earthscan).
- 3] Wackernagel, M. & Rees, W. (1996) *Our Ecological Footprint: Reducing Human Impact on the Earth* (Stony Creek, CT: New Society Publishers).
- 4] Raco, M. (2005) Sustainable development, rolled-out neoliberalism and sustainable communities, *Antipode*, 37, pp. 324–347.
- 5] Raco, M. (2003) New labour, community and the future of Britain, in: R. Imrie & M. Raco (Eds) *Urban Renaissance, New Labour, Community and Urban Policy* (Bristol: The Policy Press).
- 6] Urry, J. (1995) Social identity, leisure and the countryside, *Consuming Places*, (London: Routledge), p. 225.



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