CHAPTER 4
PROPOSED CDM MODEL; ERGOPOLIS – A CDM MODEL FOR SUSTAINABLE RURAL DEVELOPMENT

4.1 Introduction

Rural development is a never ending ever beginning challenging task which needs to be addressed at this point of time. It’s a long journey to accomplish to development especially in rural areas due to their backward ness in many dimensions with respect to their backwardness in many dimensions of sustainable rural development which is the need of the hour. The main principle objective of sustainable rural development is to rebuild the villages as they are self-sufficient units for fulfilling basic needs of rural community, like balanced healthy nutritious food for all the rural community who are feeding the rest of mankind, health and educational facilities, civic amenities along with sustainable transport systems and telecommunication systems. As these are essential minimum requirements of rural community for sensible meaningful life in rural biomes.

Nearly all aspects of rural life are in extricable (to come out of extreme difficulty), and interconnected and not every aspect can be dealt with isolation. It can be done with an ideal to bring them together with an awareness to rebuild them for them.

Villages are self-sustained communities, they leastly depend on external aids, they are like plants and trees as they sustain with nature. The rural way of living has sustainable life styles and sustainable livelihoods as they sustain with nature causing least or no pollution. These the parameters used for developing the appropriate CDM model as Ergopolis to make villages as tradable commodities as they act as carbon sinks to bring them under carbon trading to invite FDI in the form of Total Village
Development Model (TVDP) an element of the Ergopolis a CDM model for Sustainable Rural Development.

The present trend in developed nations is that, they are up with the projects of Eco Villages, with large and heavy investments they are making the village communities. Since its origin India villages are the building block of our nation as like Bricks are building block of Building, Families are the building block of Society and villages are the building block of or Nation India. Indian can be considered as land of villages, as we have 6.5 lakhs vernacular diverse villages spread in 29 states in different terrains.

"The soul of India lives in its villages". As conveyed by M. K. Gandhi a century back. According to the 2011 Indian census, around 68% of Indian population is living in 6, 45,856 different villages. According to the 73rd Amendment to the Indian constitution in 1991-92 made rural democracy mandatory in creating the three tier grassroot democracy at the village, block and district levels as 39 states and 7 UTs, comprising 619 districts, 6484 blocks, 2,55,000 village panchayats accommodating around 70 million population.

Indian 15th census for the first time in its history collected biometrics or citizens of India, since 1892 and 2011 this marks for the first time. One sixth world population is spread across 29 states and 7 union territories, covered with 640 districts, 5,767 tehsils, 7,933 towns and more than 6,40,000 villages. A total of 2.7 million officials visited households in 7,933 towns and 6,40,000 villages, classifying the population according to gender, religion, education and occupation.

Here, in the face of diversity of all kinds, farmers follow time-tested as well as innovative methods of growing agricultural crops like wheat, rice, lentils, vegetables,
fruits, and many other crops in order to feeding many countries with exporting, themselves and the nation. Here, too, flourish many of India's most valued cultural forms. Viewed from a distance, an Indian village may appear deceptively simple. A cluster of mud-plastered walls shaded by a few trees, set among a stretch of green or dun-colored fields, with a few people slowly coming or going, oxcarts creaking, cattle lowing, and birds singing--all present an image of harmonious simplicity. Indian city dwellers often refer nostalgically to "simple village life." City artists portray colorfully garbed village women gracefully carrying water pots on their heads, and writers describe isolated rural settlements unsullied by the complexities of modern urban civilization. Social scientists of the past wrote of Indian villages as virtually self-sufficient communities with few ties to the outside world.

In actuality, Indian village life is far from simple. Each village is connected through a variety of crucial horizontal linkages with other villages and with urban areas both near and far. Most villages are characterized by a multiplicity of economic, caste, kinship, occupational, and even religious groups linked vertically within each settlement. Factionalism is a typical feature of village politics. In one of the first of the modern anthropological studies of Indian village life, anthropologist Oscar Lewis called this complexity "rural cosmopolitanism."

The existing Indian rural living system has its own identity in terms of sustainability by virtue of the good practices which was passed on to successive generation from the early beginning of the settlement system in India. Though the existing rural living system in the present context seems crude and premature in reality, it has very high value based socio-environmental back drop. However there are no scientific ways in value added rural development schemes to promote holistic development by valuing the rural lifestyle as existed in India. Hence the same issue is
considered as base for the research. The research study has been carried out as follows. Hence, the research studies were started with a detailed study of activities in rural system and identifying the role of those activities under social dimensions and also value them at the environmentally or eco-friendly scale.

The rural activities like cooking, cattle rearing, planting and growing food products, etc. by respecting the nature are studied with respect to socio-cultural and socio-environmental dimensions. Then for the same study, it is required to proceed with a scientific approach which is required to be defined by valuing the same by tracing their carbon footprint as they can be valued under carbon credit certification. Here each rural activities were analyzed in terms of its carbon production. The average magnitudes of carbon production in the total living style of the villages were assessed and the same has been considered for the carbon trading processes. As the carbon trading under Clean Development Mechanism prescribes least or null production of carbon, here an attempt has been made to trace the carbon foot print in the whole activities in the rural scenario. The study was carried out in the selected area or study area for the research as discussed in the Chapter-3.

This attempt is to find evidences to stress existing rural living system, which is already has followed pattern of living in the form of Clean Development Mechanism by virtue of practices that has sustainable livelihoods and lifestyles since the origin of Indian rural culture. In the second stage of the research, a study has been carried out on the existing rural development schemes in the study area were listed out and studied in relation to their compatibility to promote sustainable development. At this stage an attempt has been made to check how the existing approach of rural development schemes were successful in enabling rural development schemes to empower the rural inhabitants. By verifying how effective the existing rural
development schemes are structured under sustainable development. And also are able to attract investment at international scale in the form of Foreign Direct Investment for the brighter future of rural India.

Hence, rural development schemes in the study area are studied and their structure has been studied to evaluate their strength and weakness in empowering the rural inhabitants in all respects by attracting the Foreign Direct Investment. The study was carried out by collecting the data of rural development schemes to study scheme structure, their fund flow mechanism and technical viability to promote sustainable development. Discussions in the following sections gives details of the rural development schemes and their structure of formulations and implementations. The discussions of the study, which is carried under the aim of this research, has been carried out majorly on two broader aspects.

i) The study verifies whether the existing socio-economic development schemes of rural area are environmentally viable to promote sustainable developments, which in turn make them to fit into Clean Development Mechanism.

ii) To study the efficiency of the rural development schemes in attracting foreign direct investment.

4.2 Principle Nature of Biosphere is as follows:

- Everything in the Nature is giving, Humanity/Mankind is the receiving end, and humanity has to make a judicious use of the nature. Nature has everything for mans need but not for mans greed.

- Earth is our common home; Humanity is part of a vast evolving universe. Earth, our home, is alive with a unique community of life.
The forces of nature make existence a demanding and uncertain adventure, but Earth has provided the conditions essential to life's evolution.

The resilience of the community of life and the well-being of humanity depend upon preserving a healthy biosphere with all its ecological systems, a rich variety of plants and animals, fertile soils, pure waters, and clean air. The global environment with its finite resources is a common concern of all peoples.

We citizens of Mother Earth have to preserve and nurture the biosphere and save the Environment of Earth for future Generations to sustain and prevail.

The protection of Earth's vitality, diversity, and beauty is a sacred trust.

For actualizing this name “Ergo polis” has been coined for the Clean Development Mechanism Model which is required to be developed. The main aim of “Ergo polis” is to establish a sound base to acknowledge that that Indian Villages are already sustainable under environmental perspectives. The only hurdle they are facing is the inappropriate valuation technique of villages under the CDM aspects. If we consider the carbon fixing management as envisaged by environmental groups and protocols, it is certainly valued them now at a very low profile. Till this time, there are no generally agreed-upon definitions to define Ergopolis. For this reason the Ergopolis is proposed to define as:

**Ergo:** Ergo may refer to: A Latin word means "therefore." In logic, ergo means the *conclusion of a preceding argument.*

**Polis:** in ancient Greek polis [(Ancient Greek: [pólis]) means a city-state or body of citizens. When used to describe Classical Athens and its contemporaries, polis is often translated as "city-state", a domain of a population of smaller size.
Hence the term “Polis” has been considered to represent a set of citizen body at lower hierarchy in human settlement size. The same meaning has been considered here as a village in Indian human settlement system.

And the term Ergo means “therefore” stating the meaning reason or conclusion of a preceding argument. It has been utilized here to represent a reason or the cause that is the consideration of Clean Development Mechanism for rural development which is also a principal aim the research. So a village habitat which is considered to develop a Clean Development Mechanism Model is proposed to be called as “Ergo Polis”. The “Ergo Polis” sounds, in place of traditional term village, to represent the term village in the modern context of India.

4.3 Villages are Micro nations of India.

- Therefore the term Ergo polis is coined for the purpose of defining the entire rural biomes of India under Clean Development Mechanism to develop a Clean Development Mechanism Model for sustainable Rural Development. In the research it is defended that Indian villages are of human scale settlements, and village communities are environmentally sustainable with the support of their lifestyles and livelihoods.

Hence they can be considered as micro nations.

- Our constitution as per 73rd Amendment has to empower gram-panchayths to micro nationhood for achieving highest success rate in future by executing the concept like PURA and several other rural development schemes and programmes to be executed under single widow clearance system so as to achieve desired development in scheduled time frame to result in reverse migration or mitigate migration.
Water bodies like rivers, streams, ponds and lakes are the primary reason for evolution of villages. They are they generate biodiversity and helps in formation of village communities.

4.4 According to C. A. Doxiadis the Human settlement is described as below

Doxiadis (1976) believed that the conclusion from biological and social experience was clear: to avoid chaos we must organize our system of life from Anthropos (individual) to Ecumenopolis (global city) in hierarchical levels, represented by human settlements. So he articulated a general hierarchical scale with fifteen levels of Ekistic Units

Names of Units and Population Scale The population figures below are for Doxiadis' ideal future ekistic units for the year 2100 at which time he estimated (in 1968) that Earth would achieve zero population growth at a population of 50,000,000,000 with human civilization being powered by fusion energy.

Ekistic units

1) Anthropos – 1
2) room – 2
3) house – 5
4) housegroup (hamlet) – 40
5) small neighborhood (village) – 250
6) neighborhood – 1,500
7) small polis (town) – 10,000
8) polis (city) – 75,000
9) small metropolis – 500,000
10) metropolis – 4 million
11) small megalopolis – 25 million
Ekistics is the science of Human settlements development by Greek architect in which we can find the similarities of human settlements in Indian villages which are in units from 1-7.

Figure 4.1: Villages density on earth

Source: Antropogenic biomes of the world.
Table 4.1: All-India Distribution of Rural Population by Size of Village (2001 and 2011)

<table>
<thead>
<tr>
<th>Size of village in terms of population</th>
<th>Proportion of rural population (%)</th>
<th>No. of villages in 2011</th>
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<tbody>
<tr>
<td></td>
<td>2001</td>
<td>2011</td>
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<tr>
<td>Less than 200</td>
<td>2</td>
<td>1</td>
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<tr>
<td>200–499</td>
<td>8</td>
<td>6</td>
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<tr>
<td>500–999</td>
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<td>26</td>
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<td>2,000–4,999</td>
<td>30</td>
<td>32</td>
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<td>5,000–9,999</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>10,000 and above</td>
<td>7</td>
<td>9</td>
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<tr>
<td>All</td>
<td>100</td>
<td>100</td>
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4.5 The Ergopolis a CDM model

The Model Ergopolis a CDM model (Fig 4.2) consists of three components

1. Fundamental Unit of Eropolis is a village settlement fig 4.3

2. The second aspect is Present carbon trading processes and sustainable rural development Fig 4.4

3. Present traditional way of Implementing rural development programmes through Government of India Fig 4.5
Villages are self sustained communities, they leastly depend on external aids, they are like plants and trees as they sustain with nature. The rural way of living has sustainable life styles and sustainable livelihoods as they sustain with nature causing least or no pollution. These the parameters used for developing the appropriate CDM model as Ergopolis to make villages as tradable commodities as they act as carbon sinks to bring them under carbon trading to invite FDI in the form of Total Village Development Model (TVDP) an element of the Ergopolis a CDM model for Sustainable Rural Development.
Figure 4.2: Ergopolis a CDM model for Sustainable Rural Development

Source: Compiled by author for describing Ergopolis a CDM model for SRD
The present trend in developed nations is that, they are up with the projects of Eco Villages, with large and heavy investments they are making the village communities. Since its origin India villages are the building block of our nation as like Bricks are building block of Building, Families are the building block of Society and villages are the building block of or Nation India. Indian can be considered as land of villages, as we have 6.5 lakhs vernacular diverse villages spread in 29 states in different terrains.

The lifestyles and livelihoods in villages are eco-friendly, expect with a least damages to environment by using non-renewable energy at domestic level, also villagers work for 12-14 hours per day throughout the year and contributing about 40% to our national income.
Figure 4.4 The second aspect is Present carbon trading processes and Village systems
The Clean Development Mechanism (CDM) is one of the Flexible Mechanisms defined in the Kyoto Protocol (IPCC, 2007) that provides for emissions reduction projects which generate Certified Emission Reduction (CER) units which can be traded in emissions trading schemes. The CDM can act as a total village development mechanism as villages can be made as tradable commodities under emission reduction carbon trading system.

Article 12 of the Kyoto Protocol defines CDM as it is intended to meet two objectives: firstly it assist parties not included in Annex I in achieving sustainable
development and in contributing to the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC), which is to prevent dangerous climate change; and (2) to assist parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments (greenhouse gas emission caps). "Annex I" parties are those countries that are listed in Annex I of the treaty, and are the industrialized countries. Non-Annex I parties are developing countries.

The CDM can be a fair tool for inviting FDI for Total village development for rural Indian communities. A foreign direct investment (FDI) can be defined, briefly as it is a controlling ownership in a business enterprise in one country by an entity based in another country through investment partnerships. "Standard definitions of control use the internationally agreed 10 percent threshold of voting shares, but this is a grey area as often a smaller block of shares will give control in widely held companies. Moreover, control of technology, management, even crucial inputs can confer de facto control."

The origin of the investment does not impact the definition as an FDI, what it is required to be integrated with the aim of this research.: the investment may be made either "inorganically" by buying a company in the target country or "organically" by expanding operations of an existing business in that country.

Definition of foreign direct investment in the present context, is an "Investment from one country into another (normally by companies rather than governments) that involves establishing operations or acquiring tangible assets, including stakes in other businesses. The purchase or establishment of income-
generating assets in a foreign country that entails the control of the operation or organisation.

Hence the FDI is required to be distinguished from portfolio of foreign investment (as defined as the purchase of one country’s securities by nationals of another country) as element of control to use them internationally through threshold of voting shares, But this must be regulated through government to have a control over widely participating players widely held (NGO’s, firms, companies, semi or fully Govt, institution or organizations etc.)

CARBON TRADING initiative taken up under Kyoto protocol can act as solution to resolve the deficiency of fund scarcity in India for complete sustainable rural development hence carbon trading is an innovative tool in this post-modern context to resolve a dispute between development and developing countries, about carbon emission in the developmental dynamics which is essential for govt of India to implement and Integrate rural development programmes with Clean Development Mechanism to Invite FDI for sustainable rural development in India.

This is a form of trade permitting with a common method under clean development mechanism among all countries to utilize the Kyoto Protocol; for reducing carbon emissions for mitigating climate change.

It is a good opportunity to involve developed countries for the development of developing countries, in the areas where those countries are helpless. But is can be used as a tool for promote rural development without affecting the nature.

Rural environment of the past represents the framework of regulations, institutions, and practices in villages with self-defined parameters for the sustainable use of environmental resources while ensuring security of livelihood and a reasonable
quality of life. While the scope of environmental infrastructure in the present context is often narrowed down to the provision of suitable water supply, sewerage, and sanitation systems. Along with these the rural areas are struggling for

(a) Acquisition, protection, and maintenance of forest spaces,

(b) Clean up and restoration of degraded lands,

(C) Integration of existing wildlife with natural habitat resources bio-diversity areas,

(d) Sustainable approaches to controlling, desertification, selination, flooding and drainage, (e) developing river corridors and natural bio-diversity areas, and

(f) Forest management.

Rejuvenation of natural resources through activation of watersheds, renewal of wastelands along with enhancement of farm productivity, which are component of natural environment has attained with increasing importance without understanding them either scientific approach or rural indigenous approach by expanding anthropogenic activity which inturn stresses natural resources beyond their natural regeneration capability. Along with these rural infrastructure issues related to clean water supply, sanitation, and treatment of waste water have already been take care by the authority, but not achieving success without having any impact on natural resources, common rural aspiration of living, and rejuvenation of rural environment. Hence the CDM model is developed for taking care of three core aspects, (i) Natural resources, (ii) Rural aspiration of living and (iii) Rejuvenation of rural environment.

The Government of India’s 12th Five Year Plan for the first time has set for itself the goal of faster, sustainable and more inclusive growth. Sustainability has been mainstreamed as a core objective of India’s development strategy. This is hugely important paradigm shift in how we look at development, but a structured way of
executing to benefit to the tail end rural people and its mechanisms beyond the existing structure of operation has been not thought off.

With an annual budget allocation of around INR. 75,000 crore, the Ministry of Rural Development’s Schemes have an immense potential to contribute to the goal of sustainable poverty reduction and efficient use of natural resources, including improved land use planning and management practices.

For the people in rural areas, particularly the marginalized communities, at least the government should do taking care of healthy ecosystems to support sustainable agriculture-based livelihoods and provision of essential services such as drinking water, sanitation and health care, basic education etc. Investing in natural resources also strengthens adaptation and resilience of communities towards climate change and natural disasters.

The proposed CDM model has been developed by studying the potential contribution to environmental sustainability of the schemes administered by the Ministry by looking at issues in specific, under the perspectives of CDM model and sustainable rural development, following aspects can be kept in a broader vision of the research :-

a) Improving quality of rural life and carrying of eco systems including, water in surface bodies, aquifers and soil profile and arresting degradation of natural resources,

b) Enabling sustainable livelihoods, based on sustainable use of natural resources,

c) Strengthening ecosystem resilience to enable them to recover from extreme weather events and cope with climate change,
d) Reducing the ecological footprint of interventions through efficient use of energy, material, natural resources and increased use of renewable materials by bringing the existing rural development process to fit into the main stream of programmes of international and national development programmes.

The report recommends sustainable rural development which are measures needed to achieve green, including measuring and tracking, the use incentives and the building of capital investment capacities.

The Indian Ministry of Rural Development, with continued support from the United Nations Development Programme (UNDP), it is possible to take forward the recommendations of this report and make delivery of green results a part of policy considerations and guidelines for its different rural development programmes. It is a hope that these proposals will contribute in large measure to achievement of the goals to be set in successive Five Year Plans.

Most of the traditional rural ways of living activities are pro-ecological and pro-environmental. None of their living style was against or damaging the nature.

- They were growing food with bio-manure.

- Utilizing water for agriculture from surface source (without exploiting ground water) by holding it in different forms.

- The fuel what they were using was totally from agro based bio waste.

- Cattle’s, poultry and related activities were supporting them for leading a balanced life.
- Houses were built out of their indigenous technique and locally available materials.

- Rural sanitation was organized in such a way that, it was never noticed as a major issue to be considered in a mainstream through government intervention.

It is difficult to follow the same in the present context, because India has a massive rural population. Now, though one cannot expect them to leave in a similar status, their way of living can be translated with the advancement in science and technology.

Procuring science and technology gadgets and providing rural needs both demand huge capital investment, where India does not have such an economic strength. Investing on complete requirement of whole rural India is becoming next to impossible.

Though village are feeding entire India; the same amount of investment with respect is not channelizing it was abused both by rural community and leaders of public sectors.

On the other hand most of the government intervention helping rural folk the damage to the environment indirectly. The government is supplying chemical fertilizer to get more agriculture yield. Supplying LPG and electricity to satisfy the energy needs. Under total rural sanitation, facilities are provided with no proper completion. Water supply is totally encouraged through bore wells by exploiting underground water. Water for agriculture is through old irrigation facilities, in the form of massive inundation technique. The housing facility is provided by using burnt brick, cement and tiles based built forms. Everything is provided with no community
participation. The NGO’s and private entrepreneurs are very recently are entering under profit motive but not under service motives.

One side village people are started forgetting their rural way of living that has a tradition of respecting nature and other side of India is having weak economic strength to spare on rural development.

To solve these duel issues, the idea of CDM techniques which were generally moved through international organizations and financial institutions are trying to utilize under the aim of this research.

Because, in the general observation of rural development scenario in India, it shows very less fund flow from organizations, which are under organization of United Nations frame work. As the structure of rural development programmes may not be able to fit into CDM & fails to attract funds. There is a need to restructure the rural development programmes. However the process of restructuring the rural development schemes and valuing the rural lifestyle should be done in such a way that the rural development scheme should be able to attract Foreign Direct Investment by valuing the existing rural lifestyle under carbon trading, but there are no scientifically defined parameters to value the rural lifestyle, which is ecofriendly. Hence in this research proposes the process of restructuring the rural development programmes along with rural lifestyle are considered together and defined in the form of Model called CDM model as shown in Figure.

A model is a simplified representation of an actual phenomenon, such as an actual system or process. The actual phenomenon is represented by the model in order to explain it, w.r.t., goals that to be achieved. Correspondingly, a model has been developed based on the needs of the existing rural developments to avail the facilities
of Foreign Direct Investment with carbon credit valuing technique for the rural lifestyle. The model which is proposed here with a set of sequence of operations under different authorities. This model has been derived to for considering comprehensive solutions to make the model to have comprehended dimensions of sustainable rural development under Clean Development Mechanism through Carbon Trading.

The CDM model for the whole rural development programme has been developed under three broad category to approach at different stages,

- Rural Community Development Programmes at local level
- Integrated knowledge hub for Rural Development Programmes between local and state or national authorities and ministry and
- Integrating sustainable Rural Development at international context.

In the first categorical stage, a set of sequence at local level includes village panchayath, taluk panchayath and zilla panchayath to bring out a draft for Rural Development Programmes from Community level to express their needs to government. In this process both public and private groups can participate to explore the needs of villagers who doesn’t aware about government rural development programmes which satisfies needs of people.

Next, in the second categorical stage, an integrated knowledge hub to assists for the design of Rural Development Programmes between local and state or national authorities and ministries for formulating the Rural Development Programmes under the perspectives of CDM to fit into the international context by defining threshold number of rural population or villages required to support the project under technical terms, as prescribed by technical expert groups. Later it formulates a “Project unit” that defines the size with respect to number of people or number of villages depending
on the type and scale of rural development schemes or programmes by defining it as a scheme or programme for an individual or blocks rural development. In the third categorical stage, from the preliminary studies it is understood, that the existing rural development schemes in public sector are unable to receive FDI, however the opportunities are capitalized by the private sector like NGO’s and other big firms, but their contribution to the rural development is purely a piece meal approach and does not have comprehensive sustainable dimensions for rural development. Hence the existing rural development schemes and programmes are proposed to restructure and make them to be able fit in for international carbon trading along with the approach of Private Public Partnership. By this the aspect of rural development issues can be projected as international issue by integrating with UNO which is encouraging to Fight against global climate change through the approach of sustainable development.

The proposed CDM model will help to have an inbuilt mechanism in rural living system governed under rural development schemes of CDM to capitalize the carbon credit certification at different monitoring levels. As the carbon production is very minimal in the existing scenario and can made to be zero in the CDM, it supports the research study which confirms that the indigenous rural way of living style in India can fit in the clean development mechanism processes, however the way in which the rural development schemes were structured does not have a characters of best fit to the CDM and hence the existing rural development schemes were not able to attract Foreign Direct Investment. By using the proposed model India can mobilize enough budget to develop whole rural system by inviting FDI along with its own economic strengths for promoting sustainable rural development.
If the rural development programmes brought under the CDM, it addresses the second objective by allowing the Annex I countries to meet part of their emission reduction commitments under the Kyoto Protocol by buying Certified Emission Reduction (CER) units from CDM emission reduction projects in developing countries. The projects and the issue of CERs are subject to approval to ensure that these emission reductions are real and "additional." The CDM allows industrialized countries to buy CERs and to invest in emission reductions where it is cheapest globally.

"Therefore India must do everything in its hands to keep it working," if the CDM is required to be operated in the developing countries especially in the rural development sector, it must be supported through FDI. Because almost all developing countries doesn’t have economy strength to develop rural areas under comprehensive planning & development approach. If it is required to development rural areas through CDM will make the attempt unsuccessful, no local public or private player will come forward for larger investment into rural development sector, hence it is required to operate CDM through FDI by integrating with carbon trading for achieving the dream of sustainable rural development. Hence the research study has recommended following propels.

4.6 Recommended proposals for sustainable rural development:

The major rural development schemes mentioned below can substantial and significant role in contributing for sustainable development in tune with the natural resources, biodiversity and ecosystem services provided by nature. The green orientation of the rural development schemes so as they can fit in clean development mechanism for carbon trading adhering green principles, goals, this will result in producing the expected or desired outputs and outcomes so as to monitor and evaluate
procedures and systems in accordance with the scheme guidelines.

(i) By restructuring MGNREGS so as to use rural community manpower for social forestry, lakes and ponds maintenance, solar energy establishments and to make them as common responsibility of the local community. Conservation of biodiversity, enhanced leaf manure, naturally available fuel wood, bio-waste non-wood fuels made out of cow dung, increasing the fertility of the soil, trenches for rain water harvesting for ground water recharge to conserve and preserve water, preserving and maintaining of grazing lands to reduce soil erosion are some environmental services should be assigned as common responsibility for every gram panchayath village community so as, this sets a momentum but not achieved complete objective of sustainable RD programmes. Hence further restructuring is required to monitor the same with monitory output from the local govt level to make them fit under CDM for carbon trading.

By preparing appropriate Perspective Plan of action for every Gram Panchayat on a contextual basis involving the parameters of landscape, land gradient, watershed, social forestry in wastelands etc.,

Every gram panchayaths should be assigned provision to develop green proposals contextually to strengthen the capacities of Gram panchayaths and to monitor green output results and utilise the good eco-friendly appropriate strategies for the same.

(ii) Integrated Watershed Development Programme (IWDP) of Govt of India has a primary aim for restoring ecological balance in a watershed by harnessing ground water with respect to surface water preservation, for the same conserving and developing waste lands and preserving natural resources such as soil, water and
vegetative fertile soil cover and in turn this helps in providing sustainable livelihoods for the rural people.

• Village community should be given common responsibility for mainataince of lakes and ponds,

• There is need to set up centres for checking up soil health, booklets to bring awareness of biodiversity, and utilization of natural water sources in a sustainable way to restore the health of biodiversity around the village.

(iii) For bringing Indira Aawas Yojana (IAY), under the green approach, it has to incorporate locally available eco friendly building materials, traditional building techniques, also further, IAY should encourage greater use of renewable technologies and also for reducing water usage and energy in the Housing Schemes. These material usages and the concepts of building techniques must be provided through schemes by the government to re-establish the green practice among rural people.

• There is need for preparing contextual region-specific guidelines and booklets for building houses traditionally with the locally available building materials which were practiced traditionally in the past rural way of living.

• There is need to set up knowledge hubs as resource centres to Support taluk, hobli and district level for promoting green technologies and designs also to tie up the financial systems to incorporate the green building techniques.

(iv) Ministry of rural development has set Nirmal Bharat Abhiyan (NBA) which was formerly known as Total Sanitation Campaign (TSC) which was formed for eradication of open defecation only. Now it has set 10% of the allocated budget for solid and liquid waste management. Now NBA has an agenda for safe
disposal of solid and liquid waste and to regulate and control untreated waste water to join the natural water bodies or water resources like lakes, streams, rivers and ponds. As the rural people doesn’t know about the compositing and conversion of human excreta into bio manure, they need a training & strict supervision. The mind set of people in the rural area cannot accept directly. A mode of compositing & Bio-gas unit connected to human waste, cattle waste, kitchen waste & bio waste of agriculture. It combined and executed the units either for individual’s house hold or for community use (a group of like-minded house holds) will find a success. And the same should be assisted with an expert group for execution of the project, maintenance and improvements to get back the invested money through schemes and to conserve nature and natural resources through rural public participation.

(v) National Rural Drinking Water Program guidelines of Government of India have primary priority to supply water from proper souk so as to maintain the quality of water given is potable for the real people. To pump the water from the water source and to supply potable water for the people renewable energy sources should be used along with land gradient for using gravitational force to supply water to the village people. The renewable energies like wind & solar can be utilized to lift water sustainable way. But regarding contamination a first priority must be given to strict abutment of pollution from different sources like, rural sanitation that includes solid waste & liquid waste management, storm drainage network, chemical fertilizer agriculture & horticulture practices. The rural water supply, rural sanitations and rural housing schemes must be integrated under one common benefit scheme to get a hold on the rural service improvement schemes.
4.7 Rural ecological supportive infrastructure development in India

Environment as a concept is this multidisciplinary involving a number of disciplines. The govt. is struggling, but the achievements are very least in terms of success. The draw back which pulls down the progress is lack of understanding the impact of rural development programmes on nature and lack of optimum utilization of fund to get maximum benefits. Hence the concept of “Ergopolis” has been built upon the environmental concern under multidisciplinary perspectives.

Figure 4.6: Relationship between human societies with Environment

Source: Compiled by author for describing Ergopolis a CDM model for SRD
4.8 CDM model, Proposals for sustainable rural development:

An accurate analysis and measuring the magnitude of impact of rural development programmes in improving living conditions of village people is difficult. But from a comparative study of rural people w.r.t past and present status of life as observed in the field study shows, an improvement. The improvement is not so significant, w.r.t the sustainable development dimensions of rural society. Also the improvement is the extent of target assumed while formulating rural development programme was not achieved and found not satisfactory after implementing those programmes. Still village people are suffering and living with more and more uncertainty problems, because the efforts of the government are not comprehensive integrated and effective this is due to there is no enough commitment from both, government as well as from rural people. Because of this most of the rural development programmes were not implemented at right places at right time, and also most of the rural development programmes are made effective enough to work under piece meal approach only, hence from past six decades no such sign of with positive development indentations on the status of rural life to say their rural way of life is not stabilized and not in harmony with the natural environment.

The socio-economic condition of rural people is totally deviating from their past rural life traditions. It is now totally distorted with the influence of interventions of government with its wrong approach of rural development programs and failed to protect the sanctity of Indian traditional rural way of living. Of course the rural life under physical dimensions through the government intervention through various rural development programmes have done some satisfactory job that is by, providing infrastructure like, rural roadway and transport, drinking water supply, electricity, telephone connectivity etc., but it satisfies them with lacking quality along with lot of
uncertainties. However from the study it is observed that both socio-economic dimensions and physical dimensions of rural development programme has made the Rural people to lead their life by deviating away from nature they are almost forgotten the values of their traditional natural way of living and now they are not living in the way what their ancestors lived with quality of life along with nature without damaging it. A component of artificial intrusion is found in different dimensions of existing rural life. The overall effect of this has made them not to respect nature, materialistically and their existing life is contrast to how it was in the past. Hence their way of living in modern and postmodern period has started damaged the rural ecology and environment through the present people in Cities are totally lost their control on damaging the nature and environment at last. Now from very recent years they are looking towards green city planning, sustainable city planning, eco city planning etc., but how to make rural people not to damage the nature with the intervention of government? How to make their life sustainable? and how to make sustainable rural development? The research study has found that the basic villages which are not subjected to the urban influence and has received no or least assistance from the government rural development programmes and schemes are leading a very healthy life with healthy nature without disturbing their natural ecology and environment.

The study also confirms that the existing rural development programmes are against the nature and are almost unscientific. Most of them are damaging the rural life which was associated with nature.

The damage is having its impact on two major sectors, first one is, it has a severe impact on “traditional way of rural life” and the second impact is on “the natural environment” of rural region. Traditional way of rural life means, it is not
discussing under socio-cultural perspective, - it is thinking totally on the traditional rural way of living under ecology and environmental perspectives. Those villages developed of developing with the help of rural development programmes are comes under this category.

Most of the traditional rural ways of living activities are discussed in chapter 3 which are pro-ecology and pro-environmental. Though these villages are very less in number, none of their living style was against or damaging the nature.

- They are growing food with bio-manure generated from village wastes.

- Utilizing water for agriculture from surface source (without exploiting ground water by holding it in different forms through required recharging).

- The fuel what they were using was majorly from agro based bio waste & recycling.

- Farming cattle’s, poultry and related rearing activities are supporting them for leading a naturally balanced socio-economic life with stabilized natural ecology.

- Houses were built out of their indigenous technique and locally available materials by not damaging the nature much. (less than the least threshold limit)

- Rural sanitation was organized in such a way that, it was never noticed as a major issue to be considered under maintenance etc.,

   It is difficult to follow the same, in the present context because the India has a massive rural population. Now, though one cannot expect them to lead life in a same ancestors life style form, but their way of living can be translated or modulated to be
similar by utilizing the advancement in science and technology. That is what the Philosophy of CDM is with the help of sustainable rural development schemes, UNO Co-operation, Indian policy of FDI in the rural context and by CDM the demands & needs of massive rural population can be satisfied.

Utilizing science and technology help for supporting the rural life certainly demand a huge capital investment, where India does not have such an economic strength. Existing strength of its own economy investing on complete requirement of whole rural India is becoming next to impossible.

Though villages are feeding entire India; a considerable amount of investment to their life is not channelizing properly and it was abused, it is not fair from the part of government of India. Hence, the FDI and CDM model answers the question.

How to get money to cater the needs of rural people? And how to make people to lead their healthy life with a healthy environment?

A single answer to these two questions is the sustainable rural development approach (SRD) through the proposed CDM model. A SRD approach means an effort of the rural development must be socially acceptable, economically viable and environmental friendly. This has been made self-explanatory by defining the CDM model and the recommendation of the research proposals.