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Dayalbagh: An eco-village model for environment conservation

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Abstract

With the development of world towards industrialization, globalization, higher economic growth, population growth and living standards, the consumption of natural resources has been raised a lot. However, there is a limited capacity of our planet to meet the increasing demands for natural resources and to absorb emissions and wastes resulting from us. Ecovillage is a solution for healing the planet as it demonstrates a viable, sustainable human and planetary future. In this research paper Ecovillage design patterns will be analyzed and evaluated for environmental conservation. Case study of Dayalbagh is also presented to evaluate its performance as an Ecovillage.

Keywords*: Environment conservation, ecovillage dimensions, ecovillage, pattern, performance*

Introduction

Over the past several decades, growth has leapfrogged beyond cities and older suburbs into many areas that were once rural. Today development is converting farms and forests to other uses at an increasingly rapid rate. This is an indication that standards in the management of world's natural environmental resources have fallen, which leads to a diminution in the public benefit that agricultural land forests provide (Takeuchi, 1998). However, with changes in values and pursuit of different living, awareness of environmental conservation has increased and ways of living in harmony with natural environments are now widely discussed. The word 'eco-village' is a key word for establishment of sustainable human settlements internationally (Atkisson *et al.,* 1991; Ansted and Franta, 1994).Eco-villages are the newest and most potent kind of communities with strong and vibrant social structures, united by common ecological, economic, social and spiritual values. (Robert and Diane 1991) defined an Ecovillage as a: "human-scale full-featured settlement in which human activities are harmlessly integrated into the natural world in a way that is supportive of healthy human development, and can be successfully continued into the indefinite future". Eco-villages (Jackson and Svensson, 2002) are also described as urban or rural communities of people, who strive to integrate a supportive social environment with a low-impact way of life. To achieve this, they integrate various aspects of ecological design, permaculture, green production, alternative energy and community raising practices. It is an attempt to live sustainably in the face of the limits to growth that the planet is experiencing and to renew the quality of lives with a reconnection to nature.In the research field, there are some specialists discussing Ecovillage in different ways. Most of the Researchers **(**Anderson and Cordell, 1988; Hartig *et al.*, 1991; Hartig *et al.* 1997; Berga *et al.*, 2003; Jonathan, 1998; Takeuchi*et al.* 1998; Jacksonand Svensson, 2002; Berg, 2003; Irrgang, 2005**)** focused on the investigations and environmental aspects in Ecovillages or the discussion of communal lives. However, focus on the patterns or design principle is very less. To evaluate the performance of an Ecovillage, there is a need to discover patterns of it by using a set of methodological design. Thus the aim of this research is identifying the patterns for evaluating the performance of an Ecovillage.

Material and Methods

To identify the pattern for evaluating the performance of an Ecovillage, the process followed

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is depicted in Figure 1. In this research paper, patterns of Dayalbagh, a suburb of Agra in the state of Uttar Pradesh, India, and its performance as an Ecovillage is evaluated. As the residents are not aware of patterns, only the key persons were interviewed. Mr. Prem Prashant, (at present Junior Vice President of Dayalbagh, Former Chief Secretary, Harayana).

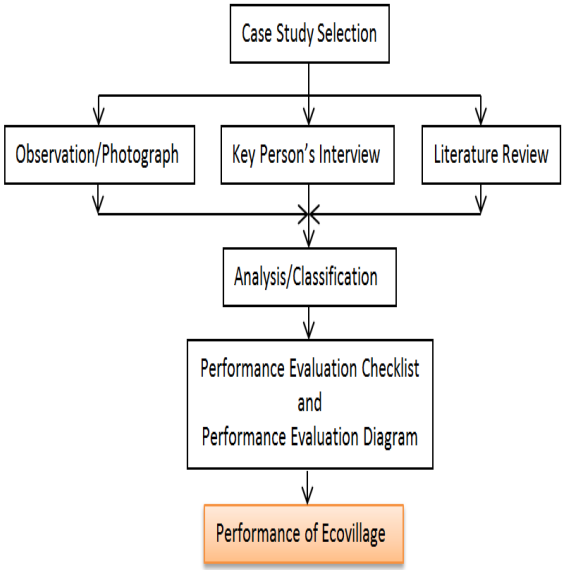


Fig. 1:- Process of the research

Prof. Sant Saran Srivastava (at present Chairman Shiromani Nagar Committee, Ex-Registrar, Dayalbagh Educational Institute), Mr. Subedar Singh (General Manager, Agriculture , Dayalbagh) Mrs. Surekha Yadav (Advocate and Social Worker, Dayalbagh) and Prof. A. K. Sinha (Member of Wildlife Board of India, UP Government,Lucknow) were the interviewees for this research. Some of the residents were selected randomly to fill a questionnaire to get basic information of the site. The background of Dayalbagh and its features were identified by surveys and available literature (Kumar, 2012) and the photographs were taken by the author.

Case study: Dayalbagh: Background

Dayalbagh, translated as "Garden of the Merciful", exists as a satellite projection of the northern periphery of Agra and is on National Highway 2. It is a self-sustained colony well-known for its serene environment, secular establishments like the industries, the educational institutions, the agriculture farm and the activities of its inmates who lead an active, disciplined and co-operative community life, conforming to the high spiritual ideals of their faith. In Dayalbagh full benefit is taken of the characteristics of rural areas and living infrastructures with advance amenities that cannot be created in urban areas.

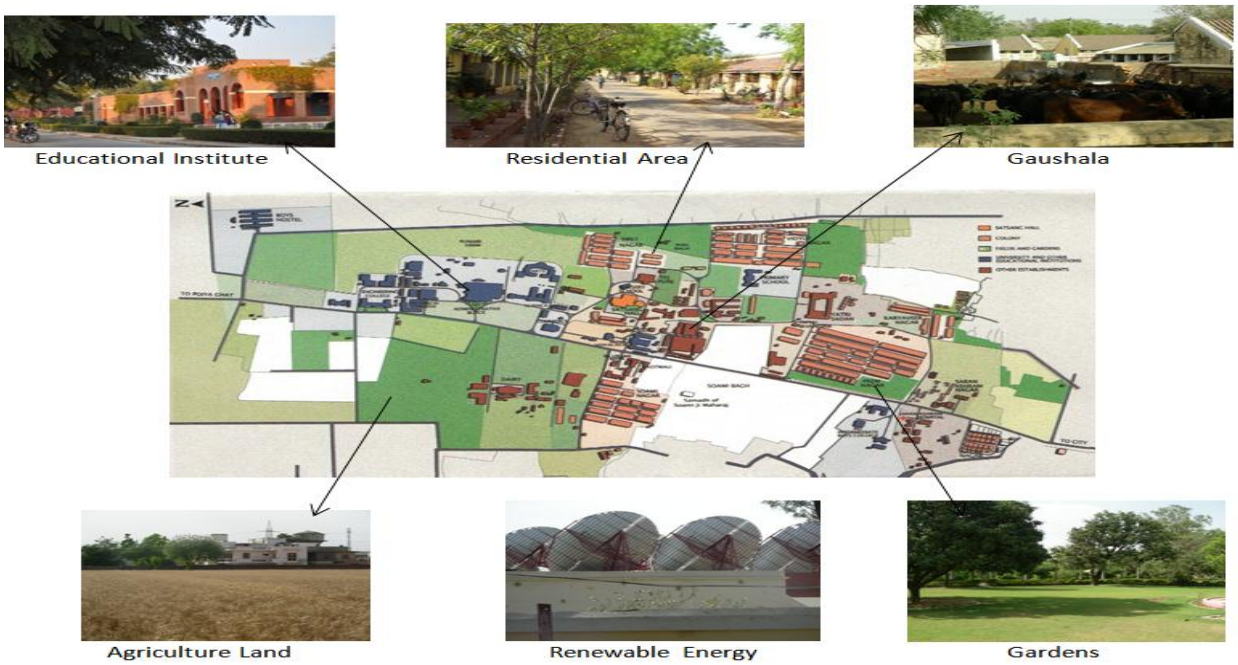


Fig. 2:- Layout of Dayalbagh

Table 1: Basic Characteristics of Dayalbagh

Parameters	Description
Location	North of city Agra, bounded on the north and west by river Yamuna
Geographic Coordinates	27°-13'-27.36" North, 78°-00'-48.93" East
Terrain	Generally level land, undulating in some parts
Total Area	2235 acres
Land use • Agricultural Area • Farm Land • Grass Land • Forest • Area prone to diluvial action of River • Institutional Area • Residential Area • Canal • Roads • Other Infrastructure	 1390 acres 260 acres 28 acres 250 acres 88 acres 146 acres 52 acres 8 acres 2 acres 11 acres
Climate • Average summer temperature • Average winter temperature • Average annual rainfall	 35°– 47° C 2°– 14° C 77.65 cm
Crop Pattern	3 types (Ravi, Kharif, Jayad)
Population (2010) • Males • Females • Children (12 yrs and below)	2896 (Total) 1296 1319 308
Literacy • Male • Female	96% (Total) 97% 95%

The physical infrastructure of Dayalbagh is given in Table 2. The total land area of Dayalbagh is 2235 acres of which 63% of the total land area is covered by greenery, the minimum requirement of which at any place in India should be 33% (Figure 3).

Facilities at Dayalbagh

A. Agriculture

One of the major comprehensive visions of Dayalbagh is that of integrated agriculture vision which pair small scale production in kitchen and community gardens with larger plot farming in the suburb. There are Green Houses, botanical gardens, Nurseries for seed growing and Krishishala and Sewage Treatment Plant for agriculture management. The Agricultural layout of Dayalbagh is shown in Figure 4.

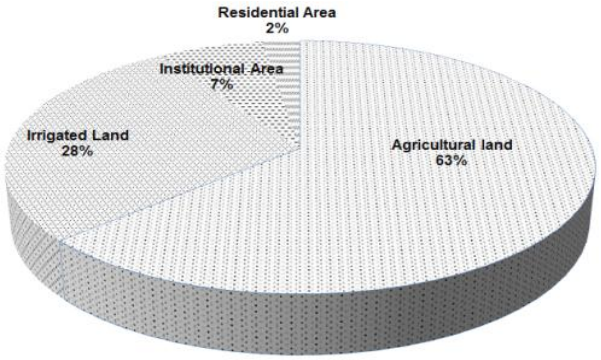


Fig. 3:- Land Usage

Farming (Figure 5) is labor intensive and all members of the community voluntarily participate in it. This type of farming saves energy, transportation and provides fresh crops at a cheaper rate. It also saves wastage and improves environment.

B. Educational Facility

Visionary Leaders of Dayalbagh foresaw education as a thrust area for the community. The foundation of a school was laid down the very next day after the foundation of the colony. The education system followed here is unique and provides value-based, multi-disciplinary education with work experience. The educational institutes of Dayalbagh are listed in Table 3.A Research and Technology Park has been established to encourage research activities in recent technologies. At present this Research Park has two centers: Quantum Nano Systems Center and Center of Consciousness Studies. The Center of Consciousness Studies relate to the scientific study of the subject Theology. Professor Stuart Hameroff, Director, Center of Consciousness Studies, University of Arizona, Tuscon, during his visit to DEI remarked that DEI is the only place where this subject is being studied in such a wide perspective. Thus it is clear that at Dayalbagh the goal of education and the goal of spirituality are one and the same in their ultimate consummation.

Table 2: Physical Infrastructure

Infrastructure	Description	Note
Residential Colony	Six Mohallas: Prem Nagar, Vidyut Nagar, Swet Nagar, Soami Nagar, Karyaveer Nagar and Saran Ashram Nagar	971 Houses an approx. 850 households (all owned by Radhasoami Satsang Sabha or by some institutions like Dayalbagh Educational Institute. There is no private property within the colony)
Educational infrastructure	Schools and University	With playgrounds and full-fledged libraries
Medical Facilities	• Saran Ashram Hospital • Ayurvedic Pharmacy • Unani Dispensary • Homeopathy Dispensaries • Acupressure clinic • Drug Depot	Hospital has facilities in Basic health care, Dental care, Pediatric care, Eye-care center (with operation facilities), Physiotherapy, Emergency care, Maternity care, ultrasound, ECG, and pathological testing
Banks	• Radhasomai Urban Co-operative Bank Ltd. • New Agra Urban Co-operative Bank Ltd. • Dayalbagh Mahila Co-operative Bank Ltd.	
Shared Facilities	• Dayal Bhandar (Community Kitchen) • Yatri Sadan (Pilgrim shed with basic facilities) • Satsang Hall (Religious Congressional place)	
Other Infrastructure	• Gymnasium and PT Ground • Gaushala (with 839 herds of cattle of Sahiwal and Friesien breeds) • Printing Press • Construction Department • Essential Services Department • Electric and Water Supply Department • Eco-friendly Cremation Ground	Milk is distributed at nominal rates for the residents and free for the young students. The Dayalbagh Press prints Books and two Satsang weeklies, English Herald (also available in its e-version) and Prem Pracharak

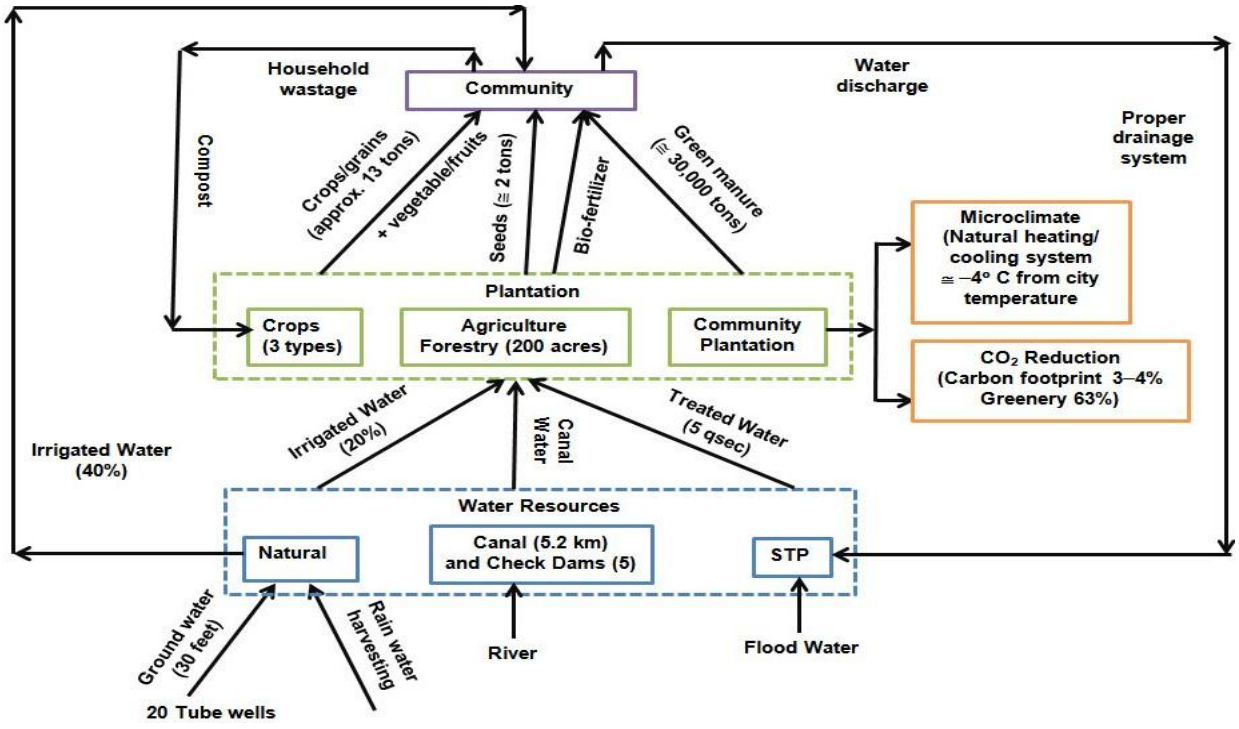


Fig. 4:- Agriculture Layout of Dayalbagh

Fig. 5:- People at Agriculture Farm

C. Industries at Dayalbagh

Dayalbagh acquired a name for its small-scaled industries which were a true manifestation of the 'swadeshi spirit'. These industrial units run as Joint Stock Companies and Co-operative Societies, manufacturing footwear and leather goods, travel accessories, handloom weaving, Ayurvedic and Unani medicines, textile and hosiery including woolen knitted garments, soaps and detergents, canvas and rexine goods. To augment industrial activities, exhibitions are held all over the country to improve sales and to make Dayalbagh goods available to general public. The goods produced are sold almost at cost. Leather goods and footwear are also produced from the cattle which are already dead.

D. Medical Facilities

To provide medical aids to residents of the colony, Saran Ashram Hospital and various dispensaries are established at Dayalbagh (Table 1). Various Pharmaceutical medicines like chavanprash, Pain balm, Digestive Powder (churan), manjan, etc. are also prepared here. Medical camps are organized to provide free treatment and medicines to the nearby villages.

E. Life at Dayalbagh

Life in Dayalbagh is self-managed and follows a systematic way. The day here begins with congregational prayers, followed by physical fitness exercise and works on the farms and in colony by way of Seva (community service), where after people go to their respective vocations. The day ends with Evening prayer.

F. Administration of Dayalbagh

Radhasoami Satsang Sabha, a religious and charitable society registered under the Societies Registration Act 1861, is the apex body governing the affairs of the community members and the colony of Dayalbagh. Civic affairs are managed through Shromani Nagar Committee under overall supervision and control of Radhasoami Satsang Sabha.

G. Rich Landscaping

There are fewer roads and more landscaped public spaces at Dayalbagh. All the three components of social forestry: community forestry, agro forestry and urban forestryare in practice at Dayalbagh. Due to these urban parks, hot winds from Rajasthan are obstructed by the dense vegetation here which is why the maximum summer temperature in Dayalbagh is nearly 4° lesser than the city. Maximum temperature in Agra usually is 48°C whereas the maximum temperature in Dayalbagh fluctuates between 42°C to 44°C (*Source: Aj Daily newspaper*).

Fig. 6:- Agro Forest in Dayalbagh

Fig. 7:- Kurtalam (Urban Park of Dayalbagh)

H. Biodiversity of Dayalbagh

Biodiversity of Dayalbagh is very rich. Table 4 gives the plant diversity, Table 5 shows animal diversity and Table 6 lists the avian diversity.Talltrees provide vegetation that shades and cools streets, courtyards and buildings in summer. Due to presence of dense and tall trees in this region the soil is highly productive and soil erosion is negligible here. Dayalbagh because of its fresh air, naturally become the lungs of the city.

Table 4: Plant Diversity

Medicinal (11): *Emblicaofficinalis (Amla), Acacia nelotica (Babool), Bambusaarundaceae (Bamboo), Aeglemarmelos (Bel) etc.*
Timber: *Mangiferaindica* (Mango), *Tectonagrandis* (*Teak*), *Dalbergialatifolia* (*Shesham*)
Fuel: *Azadiractaindica* (*Neem*), *Tamarindusindica* (Tamarind), *Syzygiumspp* (*Black berry*), *Buteamonosperma* (*palas, flame of the forest*)
Native (13): *Ficusbengalensis* (*Banyan*), *Ficusreligiosa* (*Peepal*), *Punica granatum* (Pomegranate), Citrus spp. (*Orange*), Musa paradisiaca (Banana) Vitis vinifera (Grapes), etc.
Spices (8): Zingiber officinale (Ginger), Coriandrum sativum (Coriander), Allium cepa (*Onion*), Allium sativum (Garlic), *Azadiractaspp* (*curry leaves*)
Other (Decorative) (17): *Saracaasoka* **(**Ashok**),** *Shorearobusta* **(**Pine trees**),** *Bombaxceiba* **(***Semal***),** *morus alba* **(***Mulberry***),** *Michaeliachampaca* **(***Champa***), etc.**

Table 5: Animal diversity

Mammals
Squirrel
Pangolin
Pteropusgigantica
Pteropusmedius
Bosephalustragocamelus(blue bull)
Langur
Rhesus Monkey
Jungle cat
Donkey
Mule
Pygmy hog
Porcupine –*Hystrix*
Hog deer
Herpestes mongoose
Herpetofauna
Naja naja Cobra
Python molurus
Python reticulatus
Viper aruselli
Bungarus cerelulus
Ptyas mucosus Rat snake
Krait
Ophio phagus Hannah
Tree snake
Echiscarinata
Eryx johnii
Sand boa
Natrix piscator
Trionyx punctatum
Chitra indica
Kachu gatectana
Varanus bengalensis common Indian monitor
Varanus griseus desert monitor
Calotes versicolor Garden lizard
Hemidactylus flaviviridis wall lizard
Mabuia
Ureotyphlous Limbless lizard-
Chaemeleon zeylanicus
Rana tigrina
Rana cyanophlyctis
Hoplo batrachustigrinus

Table 6: Avian Diversity

Wetland Birds	**Land Birds**
Sarus Crane	Peafowl
Storks	Black Francolin
Herons	Indian Grey Hornbill
Adjutant	Vultures and other scavenger birds
Ibis	Kites, Falcons and hawks
Shanks	Owls
	Sparrows and other passerine birds

Analysis: The eco-village dimensions of Dayalbagh

This section presents the analysis of Dayalbagh as an eco-village (Jackson and Svensson, 2002). identified four dimensions of Ecovillage: Ecological, Economic, Social and Spiritual dimensions. Xhexhi, (2011) categorized the dimensions regarding Ecovillage design into three - Architectural, Ecological and Social dimensions as architecture is the main issue. In this paper patterns have been identified for four dimensions: Architectural, Ecological, Social and Spiritual. Each dimension will be subdivided into 5 elements (Jackson, 2004; Jackson and Svensson, 2002; Fotopounos, 2002). Each element is defined and analyzed in following paragraphs to evaluate the performance of Dayalbagh as an Ecovillage.

A. Elements in Architectural Dimension

i.Localization

Definition: Planning is localized utilizing existing infrastructure and public transportation.

Dayalbagh is well connected to the main city Agra. Despite the environmental features the existing infrastructure and public transportation are utilized to conveniently support the resident's daily living. On the other hand the work place, schools/college/university, etc. have made it more convenient for daily living.

ii. Layout

Definition: The physical arrangement affects the way residents contact and move around within the area and also affects how the communal facilities are used. It also influences the relationship between private and communal activities.

Dayalbagh colony has six Mohallas with about 850 households. The houses at Dayalbagh are placed in row facing to streets. The benefit of this arrangement is that there is spontaneous contact between neighbors which contributes to the resident's social relationships and the sense of belongings.

iii. Communal Premises

Definition: A common locality is accessible to all households. There are possibilities for organized activities.All the common (Workplace, Educational Institutes, Hospitals etc.) localities are easily accessible to the households. The locality is used for recreation, socializing and even for professional workspace which does not infringe on common usage.

iv. Communal outdoor spaces

Definition: The communal outdoor environment offers:

a. Adequate space for residents being outdoor
b. At least 5 hours of sunshine between 9 to 17 o' clock for mental and physical health
c. Healthy and safe environment for children
d. Luxuriant vegetation to provide a habitat for birds, butterflies and other creatures
e. Aids to recognition, belonging and confidence

The outdoor spaces within Dayalbagh offer all the above properties.

v. Environmental friendly material

Definition: Environmental friendly material refers to non-toxic, less energy consuming, biodegradable and recyclable material and those have been proven reliable and are certified.

The Physical infrastructure of Dayalbagh is build up by these materials:

Buildings

The Dayalbagh colony is well planned and has a garden character. Community design (buildings, infrastructure and activity areas) is done that respects and includes the needs of the Earth, local flora and fauna, as well as the needs of humans.. Following are the features of the buildings of Dayalbagh:

- Natural/non-toxic insulation materials,
- Design to blend with the environment (colors, materials, site selection, etc.),
- Design and construction planning for long life and/or renewability,
  Passive solar features at Dayalbagh Educational Institute and its hostels and at present partly for domestic purposes,
- CFL lamps throughout,
- Roofing with natural clay tiles

Transportation

In Dayalbagh residential quarters, work place, schools, health centers and shops are very close to each other. Thus people mostly commute on bicycles or on foot. Battery charged tempos and solar energy vans are used inside Dayalbagh for commuting the senior citizen and infirm people. There is a CNG bus for transporting pilgrims between railway stations and Dayalbagh during the Basant, Holi and Bhandara (Religious Feasts) celebrations.

B.Elements in Ecological Dimensions

i. Permaculture

Definition:

a. Plan the ground by zoning
b. Natural and cultural attributes are retained to the greatest extent possible
c. Every household has access to a gardening space for household needs
d. Building and landscaping are adapted to micro-climate.

The site of Dayalbagh has sufficient area while all houses are situated along the axis from west to east. Zoning concept regarding permaculture is

implemented for Dayalbagh. The natural and cultural attributes such as local architectural form and materials of the site are retained to the greatest extent possible. The colony is planned as ecology whole which means it adjusts to local elements and environment. Every household has gardening space at the front and backside of the house which is used for plantation of decorative plants. Building and landscaping are adapted to the microclimate, including access to sunlight, shelter from the wind and proper water drainage system.

ii. Organic Food Production

Definition: The opportunity for residents to cultivate their own food is provided. Dayalbagh practices organic farming for food production. Pesticides, insecticides, fungicides and other harmful chemicals are not used in the agricultural fields here. The percentage usage of fertilizers is depicted in Figure 10.

Fig. 9:- Organic farming practices at Dayalbagh

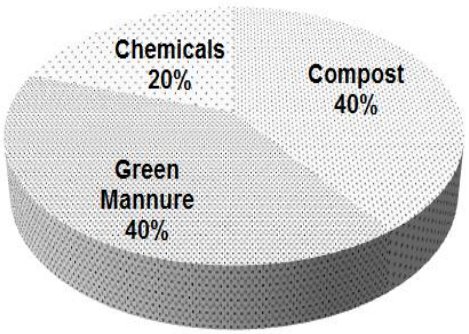


Fig. 10:- Percentage usage of fertilizers

iii. Renewable energy systems

Definition: a. Heating requires as little energy as possible using renewable energy. Electric wiring and appliances are energy efficient. Bulk purchase from M/s Torrent Power Ltd. is made at 33 KV which after step down is supplied to the colony. Use of electricity is regulated to 300 units per month per house. The occupants invariably consume electricity much less then this limit. To preserve environment utilization of solar energy in the colony is growing. Solar panels are steadily being implanted on tops of several buildings. About 70% of energy requirement of Dayalbagh Educational Institute is met with solar energy. The energy consumption at Dayalbagh is depicted in the figure below.

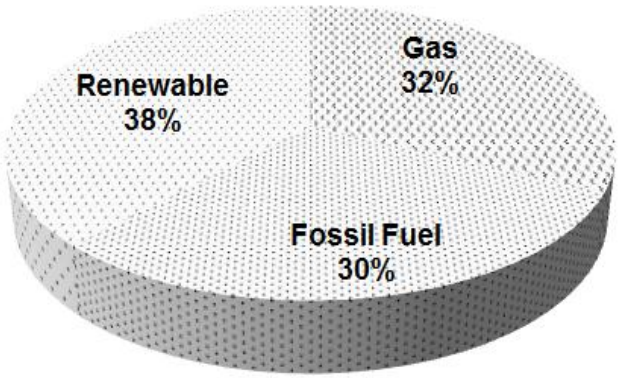


Fig. 11:- Energy Consumption

iv.Protecting biodiversity

Definition:

a. Residents should be aware of ecological issues
b. Environmental education must be part of curriculum
c. Hunting and poaching should be restricted
d. Proper health measures should be taken to protect the animals

a. **Public Awareness**

The Society for Preservation of Healthy Environment, Ecology and Heritage of Agra (SPHEEHA) is actively engaged with Dayalbagh Educational Institute for sensitizing the public towards ecology related issues. There is a Horticulture Department where the community members participate in activities to maintain orchards and green ways which further improve the ecology system of Dayalbagh.

b.**Environmental Education**

Environmental education is taught at Dayalbagh from the primary school level. Children clean the

colonies by picking up the plastics and polybags (although use of these is restricted) and dump them in dust bins under the supervision of their teachers.
Students of university level work for the environment under National Service Scheme (NSS). Camps are organized by NSS to clean the nearby slum areas and educate the slum people about the cleanliness and waste disposal. Short and weekly camps are also organized for the students which inculcate the habit of environment cleaning and public awareness. Environmental management and impact assessment is included in the syllabi of Science Graduates and Post Graduates and also for M.Phil. students.The urban parks of Dayalbagh also work as educational place where children can learn about nature and environment.

Fig. 12:- School and University students cleaning the environment

c. **Negligible anthropogenic pressure**

Anthropogenic pressure is negligible at Dayalbagh as people are religious and vegetarian. They consider teasing and hurting animals is a sin. There is a cohabitation of human with biodiversity. Animals do not get scared when humans come nearby live freely without any fear of being poached or accidental death.

d.**Health Measures**

There is a cattle breeding center for improving the breed of its cattle at Gaushala. Feeding and milking of the animals is done regular staff as well as by volunteers. Animals are not killed here for leather production. Old and dry animals are not sold in the market, but are taken care of in Gaushala till their natural death. Regular health checkups are done for animals by veterinarians.

e.**Negligible Congestion and Pollution**

The residents mostly use bicycle or walk for commutation. Pollution level is less as compared to other areas of the city as number of vehicles passing by Dayalbagh is very low. Dayalbagh also has broad carbon sinking areas which help in less carbon emission and create balanced environment.

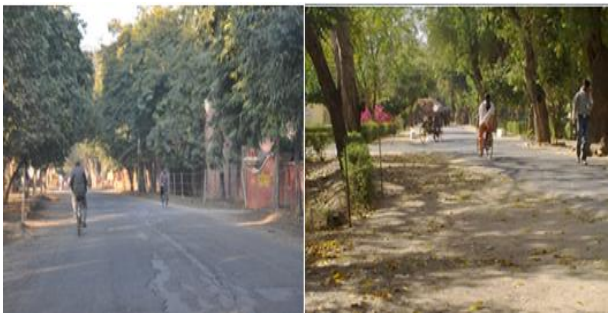


Fig. 13:- Congestion and Pollution free environment

v.Recycling and waste management

Definition:

a. Sewage is treated on site to the great extent possible.
b. Solid wastes are reused or recycled
c. Rain water runoff is designed to infiltrate the soil

a. Water re-charging initiatives

To augment water availability for irrigation, water is treated from Sewage Treatment Plant (STP), the capacity of which at present is 14 million liters/day. Recharge system of underground water with drain water is taken up with due precautions. Black water is treated and used for irrigation.

a. Recycling of Biomass into Organic Manure

The Biomass generated in the Dayalbagh Colony like grass, weeds, leaves are regularly collected

from various Mohallas and transported to Gaushala compound to be user as fodder or for composting. This compost is being used in the agriculture fields to promote organic farming.

c.**Water Harvesting System**

Every house in Dayalbagh is connected with a pipe line which passes from the threshold of all the houses for the conservation of rainwater and the water is sent into the agricultural field. Water table is higher as compared to that of city. Domestic waste water is sent through the pipelines to the treatment chambers which are utilized for gardening etc.

Fig. 14:- Water conservation system

C. Elements of Social Dimensions

i. Public Participation

Definition:a.Establishment of communal identity process

b.Administration encourages residents to participate in maintenance and take responsibility for common spaces and properties.

Residents of Dayalbagh participate in the planning and design process and contribute to establishment of communal identity process. They participate in maintenance and take responsibility for common spaces and properties.

ii. Preventive health practices

Definition: Concern for health and well-being of other members in the community, irrespective of age, sex, status, caste and creed.

Free services, consultation, testing as well as supply of medicines are available. The members are given preventive treatments from time to time, for example administration of quinine in the Malaria season or distribution of Kalmegh for prevention from chicken gunia etc. Every Sunday there is a free medical camp for the people living in neighboring villages and other localities, where a team of doctors (specialists and physicians) give treatment and preventive measures to them. Government Preventive programs also run within the community. Tele-medicines consultations are also being facilitated.

iii.Women Empowerment

Definition: Efforts are done for social upliftment of women.

An Association of ladiesis established for social upliftment of women and to promote co-operative work among them. It runs a Library and children reading room, meets the requirements of household articles of consumption like, spices, pickle etc.The ladies of the Association are also engaged in knitting, stitching, block printing etc. This Association organizes cooking training for girls.

iv.Promoting unending education

Definition: Educational development should be integrated in such a manner that it brings about a social transformation and reduction in the ranks of the unemployed. The objective should be to enable students to inculcate the dignity of manual labor, and to encourage initiative and creative work.

The education policy of here aims to develop a 'Complete Man' imbued with the values of humanism, secularism and democracy. The education provided here is very cost effective at very low fees. Students get ample opportunities for working in agricultural farms, factories or workshops, so that they develop vision for a real integration of the basic ingredients of Humanities, Sciences and Technology and an operational concept of work-experience in the new educational set up for national needs.

v.Green business

Definition*:*Green business means developing the local business to offer the job opportunities to the residents.

There are various functional departments like educational institutes, hospitals, banks, industrial units within Dayalbagh. Products like clothes, chyavanprash, pain balm, soaps and many others are also produced which create employment opportunities to the community members.

D.Elements of spiritual dimension of Dayalbagh

i. Proximal Decision Making

Definition: Decision-making is transparent. The community has the power of self-governance regarding community issues.

Community at Dayalbagh provides a deep sense of belonging to a group. A non-discriminatory method agreeable to the community is used for important community decisions and directions. The community also follows all the rules and regulations laid down by the Government.

ii.Unity with Nature

Definition: Spiritual concern is one of the possible conditions to initiate a eco-village, where there is a spiritual guide who helps the community to develop their relationship to the divine.

Community places values on cultivating inner peace. The community members believe in the teachings of Radhasoami Faith and act according to these teachings. The tenants of Faith are based upon a living belief in a) the existence of God, b) oneness of essence of God and the spirit-entity in man and c) continuity of life after death. The community members develop the spiritual faculty by becoming the disciple of spiritual teacher known as *Sant Satguru*.

Sant Satguru is a Master, who has by means of practices (devotional and spiritual), fully developed His spiritual faculty and realized the True Supreme Being or is processed of His status from His birth.

iii. Community Service

Definition: The community members wishing to devote themselves to a life of spiritual mastery and selfless service, are encouraged/supported by the community.

The Community Members at Dayalbagh believe in simplicity. Community Service (Seva) is the basic tenet of the Community Members. People are religious and feel everything they do as their pious responsibility and perform their duties with perfection. They offer selfless service within the community and outside the community too. Hundreds of members young and old, men and women, render seva in agriculture, Dayal Bhandar, Gaushala, night security, cleaning the colony etc. The attempt here is to live and work in harmony for the service of mankind and not for selfish aims.

vi. Celebrating life and honoring culture

Definition: Earth-based spiritualties are the primordial religion of the humanity.

The community aligns and unites for a common vision or purpose. The community responds supportively to marginalize community members (the poor, ill, dying, troubled, disabled, elderly, etc.). Members endeavor to strengthen its ability to successfully handle challenges/crises. Brotherly spirit pervades among all the members of the community and prejudices and superstitious regarding caste, creed, nationality or color do not find place in Dayalbagh. Summer Camps are organized during summer vacations for the children of the community from various regions to develop habit of community living and to know about the Satsang culture and values.

Fig. 15:- Youth at community Service

vi.Creation of a peaceful, loving, sustainable world

Definition: Peaceful living is about the conscious pursuit of authentic happiness and finding true fulfillment in life. The community must have'friend of-all' attitude and there must be internal and external harmony of its member.

Life in Dayalbagh is systematic with "simple living and high thinking" policy. This system of life is helpful for the harmony in physical, mental and spiritual subsystems of our life. This also leads to the better worldliness. The members believe in the ideal of Fatherhood of God and Brotherhood of Man.

Results and Discussion

Based on the above analysis, these 20 elements are summarized and scored in a Performance Evaluation Checklist (PEC) for evaluating fulfillment and performance of Dayalbagh as an Ecovillage. Each of the element is scored as 0- not implemented, 1- fulfills little, 2- fulfills somewhat and 3- fulfills much. From the checklist, Architectural dimension scores 14 points, Ecological dimension scores 14 points, Social dimension scores 14 points and the Spiritual dimension scores 14 points.The results are now applied to Performance Evaluation Diagram (Figure 16), a modified evaluation diagram (Jackson and Svensson, 2002). Each score in the diagram has its own color to present its scale. The darker colors

present the higher degree of fulfillments for the criteria. Based on this diagram the performance of each dimension will be known. Then the orientation of the Ecovillage can be defined to emerge the interpretation. The performance evaluation diagram indicates that all the four dimensions of an eco-village are fulfilled at Dayalbagh and therefore its performance as an eco-village is good.According to the evaluation shown in the Table 9, it can be seen that all the four dimensions of the Ecovillage have the same weightage. The total grade is 56 out of 60. This indicates that the entire performance in Dayalbagh is even and all of the four dimensions jointly and evenly support the performance of sustainability in it. Thus, Dayalbagh is a balanced Ecovillage model.It is important for an integrated eco-village that the total grade is high and the entire performance is even at the same time. If the total grade of an Ecovillage is high, but has a very strong orientation, while other dimensions are neglected, this eco-village can cause some unbalanced results for the daily living [Lin, 2007].

Table 8: Performance Evaluation Checklist

Dimensions	Elements	Score 0	1	2	3	Subtotal	Total
			fulfills little	fulfills somewhat	fulfills much		
Architectural	Localization			✓		14	54
	Layout				✓		
	Communal premises				✓		
	Communal outdoor spaces				✓		
	Environmental friendly material				✓		
Ecology	Permaculture				✓	14	
	Organic food production				✓		
	Renewable energy				✓		
	Protecting biodiversity				✓		
	Recycling and waste management			✓			
Social	Proximity decision making			✓		14	
	Preventive health care				✓		
	Women empowerment				✓		
	Unending Education				✓		
	Green business				✓		
Spiritual	Creating awareness			✓		14	
	Unity with nature				✓		
	Selfless service				✓		
	Celebrating life and honoring culture				✓		
	Creation of peaceful world				✓		

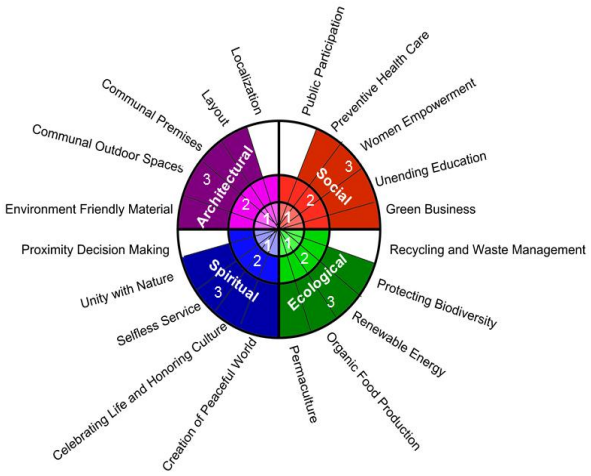


Fig. 16:- Performance Evaluation Diagram

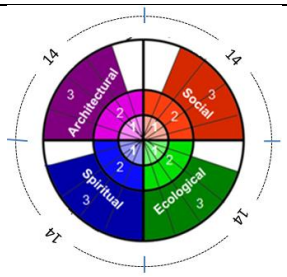
Conclusion

This paper demonstrates using the Performance Evaluation Checklist and Performance Evaluation Diagram that Dayalbagh is a balanced eco-village model having strong and vibrant social structures, united by common ecological, architectural, social and spiritual values. Dr. Gur Dayal Das (Agarwal, 2010) remarked during his visit to Dayalbagh, "with its stress on low-consumption, simple life-style, large open unpaved-unbuilt spaces, green areas providing habitat to variety of flora and fauna, large contributions to outside community (and the world as a whole) in terms of learning and spiritual peace and above all the 'friend–of–all' attitude and the internal and external harmony of its member, the Dayalbagh community is a good model of an eco-village to be emulated by other communities".

Replication of Dayalbagh Ecovillage Model will result in revitalizing measures of environment restoration and enrichment.

The exploration from the Dayalbagh Ecovillage experience leads to consideration of how the wisdom gained from it can be utilized more broadly in the global level. However, different regions have different contexts. Thus when Dayalbagh Ecovillage experience is transferred, the respects for local contexts should be guaranteed in order to adapt the Ecovillages local needs, natural conditions and social customs.

Table 9: Overall Performance of Dayalbagh

Performance	
Architectural Dimension	14
Ecological Dimension	14
Social Dimension	14
Spiritual Dimension	14
Total Grade	56
Performance Evaluation Diagram	

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