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Comparative Study Of Green Practices In Haryana State Universities

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Abstract:

Universities in the state are regarded as 'small cities' due to their large size, population, and the various complex activities taking place in campuses, which have some serious direct and indirect impacts on the environment. The current study focuses on the green practices in state universities of Haryana. The comparative analysis has been done between the multiple case studies and find out the best green practices being adopted in universities for moving towards making the green campus and recommend the area of improvement for making environment sustainable campus.

KEY WORDS: Universities, Environment, Sustainable Development, Green Practices

Objectives

The objective of the study is to done the comparative analysis of green practices implemented in daily operation in Haryana state universities for making the sustainable campus and find out the common practices and area of improvement for developing sustainable development.

Methodology

Qualitative research design is used in current study by employing case study approach of qualitative inquiry to study green practices in depth in Haryana state universities. Three oldest state universities are selected as sample unit. This study focusses on operational parameters out of the parameters in respect of four area including administration, curriculum and research area, explored by ***Maryam Faghihimani (2010).*** Primary Data of this study have been collected from 3 state universities through observation, photographs, and in-depth interviews of experts, relevant authorities, professors, research scholars of the and various stakeholders. Analysis of secondary literature including policy statements, university documents etc has also been done. The parameters of the study are as follow:

- Energy
- Carbon emission
- Waste recycles
- Green building
- Purchasing
- Water
- Food & Dinning
- Paper
- Housing Sustainability Management system
- Installation of innovative & new technology
- Conservatism
- Transportation
- Fair trade
- Chemical material
- Green lab

Study area

State university of Haryana are the main study area of the current study. There are 19 state universities in Haryana. Three oldest state universities are selected as sample unit which are as follow.

Kurukshetra University:

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The KU is the oldest state university of Haryana as it is established in 1956 as unitary residential university. The foundation stone of the university was laid by the first President (Dr. Rajendra Prasad) of India. It is located in Kurukshetra city of Haryana which is the holy city because of the historical battle of "Mahabharata" and delivery place of great message of Bhagwat Gita. The campus of the university is situated on western bank of Bhahm Sarover and extended over an area of 400 acres (university website).

Maharishi Dayanand University:

The MDU University is the second oldest university of Haryana which is situated in Rohtak city. Initially, the university is established as Rohtak university in 1976 through act no 25 of the Haryana Legislative Assembly. The main motive of the university is to promote interdisciplinary higher education and research in area of environment, ecological and life science. The university is rechristened as Maharishi Dayanand University in 1977 after the name of great visionary and social reformer. The university get recognition of UGC as a higher education regulatory body of India in 1979. (university website).

Guru Jambheshwar University of Science & Technology:

The GJU was establish on 2nd October 1995 under Haryana State Legislative Act no 17 of 1995 for providing education on Pharmacy, Environment Studies, Technology, Renewable Energy Sources, Mass Media and Management Studies. The university is named after Saint Guru Jambheshwer ji Maharaj who was the great environmentalist of 15th century. The campus of the university is situated in Hisar city of Haryana and got it recognition of UGC under sec. 2(f) in 1996 and sec. 12(B) in 1997 of UGC Act and it has been accredited by National Assessment & Accreditation Council as 'A' grade university in 2002,2009 and recently in 2019 (university website).

Introduction

In the modern era, everyone is moving towards convenience. These conveniences are achieved at the cost of environment; as a result, environment is being degraded due to the heavy demand of conveniences in life. Nowadays most of the organizations are moving towards Environment Sustainability. They are framing polices and strategies according to environmental concern. The present study focuses on environment sustainability practices in the universities of Haryana. The educational organizations like universities also cause serious environmental pollution in the form of energy and material consumption via activities and operations in teaching and research, provision of support services etc, which could be considerably reduced by an effective choice of organizational and technical measures. Now the educational sector is also taking initiatives toward environmental concern. ***Alshuwaikhat and Abubakar (2008***) in their research revealed that many environmental protection measures can be seen at some universities, but a more systematic and sustainable approach to reduce the negative impact of those activities to make the campuses more sustainable, is generally lacking. **Faghihimani (*2010)*** says that, a global trend among universities shows that they are revising their mission and restructuring their courses, research programmes and operations on campus to include sustainability in their perspectives and practices.

Sustainable Development

The word "sustainable development" was first introduced after the Rio Earth Summit in 1992 which was organised for global environmental discussions and upgrading the primary framework presented at United National Conference on the Human Environment at Stockholm in 1972(Johnson,2007). The Rio Declaration on Environment and Development highlights the significance of education in reducing the environmental degradation (Cleveland & Kubiszewski, 2007). Sustainable Development can be defined as an approach to achieve human development goals without degrading the environment to provide natural resources and ecosystem services upon which the economy and society depend. In other words, sustainable development means creating such a community where human needs can be satisfied with the use of living conditions and resources without degrading the ecological system (Wikipedia, 2018). Broadly, the concept of sustainable development combines environmental goals, especially ensuring resource availability (avoiding negative environmental impacts) and maintaining biodiversity with economic goals (especially economic viability), and the social goals (especially social justice), all of which have to be pursued simultaneously.

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Comparative analysis of state universities:

Table:1

Green Parameters	**Kurukshetra University**	**Guru Jambheshwar University of Sc & Tech.**	**Maharshi Dayanand University**
Energy:	**Energy conservation** ➢ Replaced the traditional lights by 430 LED lights. ➢ Installed Solar lights and Solar geysers in campus. ➢ Installed solar panel. ➢ Every Tuesday is celebrated as "Non – Vehicle Day". ➢ Constructed ventilated classrooms and buildings through wall size glass panels. **Using renewable energy** ➢ Two major projects of 500KW solar energy plant and another is 100KW got approved from state govt. which is under installation.	**Energy conservation** ➢ Replaced all the bulb with LED fixtures. ➢ Installed Solar laminar in campus. ➢ Solar heating system have been used in university hostels. ➢ All electric equipment's have been replaced with high energy efficient equipment like 5-star rating AC and ceiling fans. **Using renewable energy** ➢ Installed solar panel up to the capacity of 1 MW.	**Energy conservation** ➢ All the existing tube fixtures are replaced with LED Lights & LED fittings ➢ All the electric equipments are replaced with star label equipments. ➢ Placed strict instruction sign boards. ➢ Implying environmental vehicles like e-rikshaws. ➢ Maximum provision of sunlight and cross ventilation is done in classrooms **Using renewable energy** ➢ Installed 1MW solar plant system in term of BOT (Built, Operate and Transfer) basis
Carbon emission	➢ Planted more than 20000 plants in campus. ➢ Pavement along with the road have been made to make the walking and cycling convenient. ➢ LPG is used for cooking in hostels. ➢ Falling of trees is being banned in campus.	➢ More than 35000 saplings have been planted in university campus. ➢ Transplanted 125 big trees at another place. ➢ Restricted the use of personal vehicles in campus. ➢ Collect solid waste to minimise greenhouse gasses emission.	➢ Approximately 44,000 Eucalyptus trees had been planted on 10 acres of university land by forest department of Haryana Govt. ➢ More than 1200 verities of herbs have been planted in herbal garden. ➢ All the trees of campus are numbered like 1,2,3…. etc.

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	➢ Dry leaves and organic waste from household is being converted into organic fertilizers. ➢ Hazardous waste of campus is properly segregated.		➢ Approximately 18500 decorative/ornamental plants, bushes, shrubs etc have been planted around buildings. ➢ Consumption of fossil fuel has been replaced with LPG. ➢ Burning of residuals and other waste material has been restricted in campus. ➢ Organised the "Anti- Plastic Campaign" ➢ Declared campus as "No Smoking Zone"
Waste recycling	➢ Made the service agreement with Green World International Private Ltd. for e-waste recycleing. ➢ Installed sewage treatment plant, costing Rs. 4.66 crores, built in area of 2 acres.	➢ Developed Hazardous waste management system ➢ Installed a Sewage treatment plant of the capacity of 2.5 MLD. ➢ Made contract with "Synergy Waste Management" company for collecting waste and residuals from university health centre, Department of Pharmaceutical Science etc. of the university. ➢ Made contract with "Synergy Waste Management" company for collecting waste and residuals from university health centre,	➢ Solid waste is managed and handled as per the compliance criteria and procedure define in Municipal Solid Waste Rule 1999. ➢ Hazardous Waste Management Committee is formed. ➢ The liquid waste of campus is disposed off in forest land of university through constructed check dam at suitable intervals. ➢ Disposal of e-waste is done as per the guidelines of Central Pollution Control Board. ➢ Sewage Treatment Plant is under construction. ➢ Horticulture waste

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		Department of Pharmaceutical Science etc. of the university. ➢ Made collaboration with HARTRON for their E-Waste management.	is converted into manor.
Building	Planned for energy efficient green building concept in which main emphasise will be on saving energy to minimise the consumption of electricity.	➢ Strictly followed National Building Code of India in construction of new buildings. ➢ New buildings of university are equipped with solar panels. ➢ Innovative technique of decreasing the temperature of building has been used in construction of new building like HSB.	➢ Adopted the concept of green building in the construction of new building. ➢ Fly X bricks are used in place of plain bricks. ➢ WPC (Wood Plastic Composite Panel) board are used at the place of wood. ➢ Glass facades are used to ensure sun light in the buildings.
Purchasing	Prefer to purchase eco-friendly products from local market.	Invest in purchasing eco-friendly and durable products like energy efficient star rating electric equipments, LED fixtures etc. and prefer local market for purchasing.	Purchase eco-friendly products and appliances like LED lights and energy efficient star labels appliances and first preference of university is local market for making purchase.
Water	Developed water harvesting system Installed STP (Sewerage Treatment Plant).	➢ Developed water harvesting system ➢ Installed STP (Sewerage Treatment Plant). ➢ Fixed Water sprinkles in university lawn. ➢ Put damaged matka (pot) along with all plant.	➢ Developed water harvesting system along with strong water retain. ➢ Installed STP (Sewerage Treatment Plant).
Food and Dinning	Only vegetarian Diet served in metallic utensil.	Only vegetarian Diet	Only vegetarian diet

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Paper	➢ In the process of replacing hard copy by e-documents. ➢ Adopted eat and drink process for tender purpose. ➢ Support both side printing paper instead of consumer requirement of single side printing. ➢ Avoid the use of paper plates and cups in the campus but not completely banned.	➢ Initiated paperless offices. ➢ Prefer Printing on both side of paper but no policy regarding this. ➢ Auction all the exam sheets of students to the vender who is the highest bidder to recycle the waste. ➢ Paper plates and cups are avoided and steel utensil are use in university cafeteria.	➢ Support of E-documents. ➢ All the information is circulated through email among the faculty members. ➢ Have made the rule of two side printing of paper specially in case of dissertation, research thesis. ➢ Avoid paper plates and cups. ➢ Promote the recycling of used paper.
Housing Sustainability Management System	Working on energy efficient housing scheme	Surround the houses of university by lush green lawns and flora and fauna and Maximum provision of natural sunlight and air is made in houses.	Proper provision of cross ventilation, maximum sun light is made in university faculty houses and Fly ash bricks and LED lights are used.
Installation of innovative & new technology	➢ Conventional lights have been changed with CFL and LED lights. ➢ Examination system has been digitalized. ➢ Building of university is equipped with solar panel. ➢ Dry leaf maker has been utilized.	➢ Implemented and maintain the "Total computerization-A Step towards Paperless Offices". ➢ Implementing Choice based credit system (CBCS) in all the courses. ➢ Establish Centre for Radio Ecology.	➢ Initiated e-Governance to computerise the university functions. ➢ Environment friendly material is used in construction of university buildings like fly ash bricks, WPC board, glass facades etc.
Conservatism	➢ Prefer to purchase to durable products. ➢ Placard have been installed near switchboards for judicious use of fans and lights for conserving energy.	➢ Replaced all the electric equipment's with energy efficient equipment's like LED fixtures and 5-star rating equipment's. ➢ Replaced electricity with solar energy to	➢ LED lights, 5-star label equipments are installed. ➢ Installed solar energy plant in university buildings. ➢ Promote car-pooling. ➢ Invest in

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	➢ Reminder signs is placed in campus to motivate the students to switch off all the electrical equipment. ➢ Prefer both side printing on paper.	some extent. ➢ Prefer reuse and repair in place of disposing off.	purchasing durable products from local market. ➢ Prefer reuse and repair at replace of dispose. ➢ Create awareness among students regarding conserving natural resources.
Transportation	➢ Promote the green mode of travelling which is walking and cycling through Concrete pavement along with the road. ➢ Support video-conferencing facility ➢ Every Tuesday is celebrated as Vehicle free day. ➢ Provide Vehicle parking arrangement at university gate. ➢ Motivate Students and staff for vehicle pooling.	➢ Promote the green mode of travelling like walking through planting trees along with road. ➢ Provided Proper infrastructure for video conferencing. ➢ Support car-pooling for university related work.	➢ Support the green mode of transportation like e-rickshaw. ➢ Promote the walking in campus by providing health tracks. ➢ Installed the video conferencing facility in campus. ➢ Support car-pooling for university related work. ➢ Celebrate Environment related days
Fair trade	Prefer to purchase from the vender who follow fair trade standards.	Purchasing is done through tenders, quotations from the vender who follow fair trade practices.	Done purchasing from the vender who follow fair trade standards.
Chemical material	Avoid the consumption of pesticide and fertiliser which harm the natural environment and organic fertilizers are being used which is made from dry leaf.	Avoided harmful chemical.	Used branded paints which are fire retired and environmentally friendly and Avoid the use of harmful pesticide and fertiliser.
Green lab	Working on adopting the green consideration in university labs.	No green labs.	Adopted the green consideration in construction of new labs. Wall size glass panels have been used in labs to use the natural light. Every lab is equipped with fire cylinder for safety consideration.

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As per current condition of natural resources and environment, environment sustainable and green management is the requirement of today. As per the data collected fir the study, all the universities of Haryana have taken number of initiations to making the environment sustainable campus and promoting sustainable development. Some green initiations which common in all the universities are as follow:

Best Practices:

- **Establish Dedicated Department:**

  All the state universities have setup a dedicated institute of environment science which provide the professional courses in environment protection and preservation. The Kurukshetra University (KU) have "Institution of environment studies", Maharishi Dayanand University (MDU) have "Department of environment science" and Guru Jambheshwar University of Science and Technology (GJU) have "Department of Environment Sc & Engineering. Theses institution also supports the Interdisciplinary environmental sustainability education and conduct research in respect of environment sustainability.

- **Install Solar Power plant:**

  All the state universities are in process of making and utilising solar energy. Recently the Kurukshetra university has got approved two major projects from the state government - one is 500KW solar energy plant and another is 100KW which is under progress for installation over the roof of buildings. The MDU have installed Solar panels on the roof of the major buildings of university. Almost one third campus has been converted into solar system. University has requirement of nearly 4 MW electricity and 1 MV solar plant system has been fixed or fabricated in term of BOT (Built, Operate and Transfer) basis and the GJU have install solar plant up to the capacity of 1 MW on university buildings which satisfies the requirement of 45% of total consumption of university electricity.

- **Install Sewage treatment Plant:**

  All the state universities have installed sewage treatment plant (STP) where the university waste is treated and after treatment the affluent is being utilised and reused for gardening and for horticulture purpose. KU have installed STP plant, costing Rs. 4.66 crores, built in area of 2 acres which have capacity of 100 % treatment of 2.44 million litres of water per day. GJU have the plant of capacity of 2.5 MLD and in MDU, it is under construction.

- **Install rain harvesting system:**

  All the state universities have realised the gravity of water falling level of ground water. So, the arrangement has been made to resort to the rain water harvesting to recharge the ground level water. So, all the universities have developed Rain water harvesting system in campus.

- **Promote greenery:**

  All the universities are focusing on making the campus green. More than 20000 plants have been planted in campus of KU and falling of trees is being banned in campus. in MDU, approximately 44,000 Eucalyptus trees had been planted on 10 acres of university land by forest department of Haryana Govt. which have been grown fully and more than 1200 varieties of herbs have been planted in herbal garden of campus. In addition of all these, approximately 18500 decorative/ornamental plants, bushes, shrubs etc have been planted around the office buildings, residences, Rose Garden, library, Faculty House, Hostels etc for providing aroma as well as ensuring longer working hour with lesser stress. And in GJU, approximately 35% area of the campus is reserve for the greenery purpose. In 2009, University have targeted the plantation of one lakh trees and around 35000 trees have been planted till now and 125 big trees have been transplanted in campus (NAAC Report, 2014).

- **Support E-document:**

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All the state universities are the supporter of E-documents and encourage that in their campus. The hard copy has been replaced with e-document to the great extent due to which all the information is circulated through email among the faculty members.

- **Support vegetarian diet:**

  Most of the Haryana state universities serve vegetarian diet in hostels as well as campus cafeteria. As KU is situated in Kurukshetra city which is a holy city since the time of Mahabharata, non-veg is completely banned in city as well as in campus. MDU is named after Maharishi Dayanand who is great visionary and social reformer and GJU is named after Guru Jambheshwer ji who is Maharaj saint environmentalist of 15th century. So, non-veg food is not served their hostels. Only veg food is provided to the students in university hostels as well as cafeteria.

Area of Improvement:

In spite of various initiation taken the university still there is some area where improvement is required for making the sustainable campus and conserving the natural resources and environment. These areas are as follow:

- **Plastic in campus need to be banned:**

  Use of plastic is still in use in Haryana state universities in form of Cold drink bottle, water bottle, rappers, disposable glasses, etc. which are very harmful of the environment. However, single use plastic should be completely banned in universities campus. Till now, no state universities have taken such initiative. So, all the state university should not only ban the single use plastic but should also create awareness to avoid use of plastic among students, staff members and society.

- **Paper cup and paper plates need to be banned:**

  Use of paper cups and plates also harm the environment as these are made from tree which is the cause of deforestation. Deforestation provide the negative impact of environment and natural resources. The state universities of Haryana avoid their use in campus but does not banned it completely. So, all the universities should completely ban the use of paper cups and plates with in the campus.

- **Strict rule of both side printing on paper need to be made:**

  As Paper is made from tree. So, it requires cutting of tree which is the cause of deforestation. Deforestation provide the negative impact of environment and natural resources. A huge amount of paper is consumed in universities in form of assignments, thesis, exam answer sheets, reports, etc. As all the university are supporting e-document and making efforts to minimise the consumption of paper but more efforts can be taken in respect of printing. So, all the university should support printing on both the side of paper and make rule regarding it. MDU have made the rule of printing both side for thesis, assignment and reports. All another state university should also make efforts in this direction and make rule regarding it for cutting paper consumption.

- **Use of chemical hazards need to be banned in campus:**

  Use of chemical hazards and chemical fertiliser also provide a very negative impact on environment but these are still in use in universities. So, all the state universities should completely ban their use in campus and replace the chemical fertiliser with towards organic fertiliser

- **Signboard for conserving resources need to be placed**:

  All the Haryana state university should place Instruction card in every department to switch off the electric equipments or appliances when that are not in use.

- **Sensor fitting should be installed in bathrooms:**

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As India is suffering from water scarcity, water conservation is one of the challenges in front of people. All the state universities are contributing in it by installing rain water harvesting system and installation of sewage treatment plant for treating and reusing water. Installation of sensor fitting in bathrooms of campus and hostels will also help the university for minimising unnecessary use of water. So, all the universities should replace their bathroom tabs with sensor tabs.

Conclusion:

On the basis of the analysis, it is found out that all the state universities are taking initiative towards making the green campus and trying to cutting their activities which harm the environment. All universities were trying to behave as a socially responsible institution by educating the society about conserving the environment and implementing green practices in the campus. On the basis of the analysis, various best practices initiated by universities have been identified which are common in all the state universities. The study also identified the area of improvement which makes the universities more concerned for the environment and making them environment sustainable.

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