Editorial


  Greetings from PiusGiri! Shall we begin with a bow of gratitude for your earnest reception of the first issue of SPEJAS. The first issue , by its very nature , turns out to be the trend setter. The sprouting leaf , the budding blossom fills the onlooker with hope and expectation. Many a blossom bloom in the wild and blushes to oblivion sans recognition. It is you, the readers, made the difference. Your perusal made it lively, your frowns signal the warnings. We are really grateful to you.

  Here comes the second leaf , longing for your esteemed presence. When the second leaf appears , the farmer sighs a long breath of  relief, for the plant has come of age.  The second leaf, the second bout appears on time  with its rich hue and cherishing flavor, heralding the advent .

 It is the beginning of summer in Pius Giri; the leaves are pale green or rather yellowish green. Any fruit of this season is bound to be dwarf and lean,   pale and bleak. But look at the season from a different angle; consider it as autumn, the season of mellow fruitfulness. 'The lusty spring smells well 'has given way to drooping autumn that tastes well. Let this second leaf may taste well, your expectation and aspiration might find its solace.

 As a journal in its infancy, spejas needs your earnest support and valuable comments. This second leaf is at your door step, expecting your esteemed presence.


Editorial Board.

**ECO-FEMINIST LITERARY CRITICISM: A REVIEW**


**Dr FED MATHEW**

**Introduction**

   Ecofeminism, or ecological feminism, is a term coined in 1974 by Françoise d'Eaubonne. It can be defined as a social and political movement that considers the oppression of women and the domination of Nature as interconnected phenomenon, and analyses the present social reality for an equitable world order where sexism, racism, social inequalities and domination may cease to exist. As it is a combination of feminism and ecology, it has many an ardent votary who considers it an essential social encounter  to provide solutions to many long pending social and political issues. The growth of the movement was so rapid and diverse that it has become one of the outstanding branches of feminism. The diverse branches of the movement gradually developed their own theoretical positions and slowly evolved to different schools under this umbrella term of eco-feminism. This polyphonic divergence in key concepts and at times in their praxis too, have given the movement a sort of theoretical challenges  to be sorted out for its smooth growth. This paper briefly deals with these divergent positions along with other incongruities.

 **Definitions**

   Although many  definitions are available, each definition emphasizes  a separate aspect of the movement. Françoise d'Eaubonne used the term ecofeminism in 1974 as,  "In September 1973 a movement was born in France – a movement closer to the Belgian Unified Feminist party than to the French MLF." (Merchant, 1996: 74). The term  was subsequently used in 1975 by Rosemary Ruther (Ruther 1975). By providing a definition to the  movement within its contemporary context, Val Plumwood asserts: "Ecological feminism is essentially a response to a set of key problems thrown up by the two great social currents of the later part of (the last) century— Feminism and the environmental movement." (Plumwood, 1993 :10)   Mary Mellor, for instance, holds that : "Ecofeminism is a movement that sees a connection between the exploitation and degradation of the natural world and the subordination and oppression of women. It emerged in the mid-1970s alongside with second-wave feminism and the green movement. Ecofeminism brings together elements of the feminist and green movements, while at the same time offering a challenge to both. It takes from the green movement a concern about the impact of human activities on the non-human world and from feminism the view of humanity as gendered in ways that subordinate, exploit and oppress women". Lois Ann Lorentzen of University of San Francisco, and Heather Eaton, of Saint Paul University (2002) give another one: "Ecofeminist activism grew during the 1980s and 1990s among women from the anti-nuclear, environmental, and lesbian-feminist movements. The 'Women and Life on Earth: Ecofeminism in the Eighties' conference held at Amherst (1980) was the first in a series of ecofeminist conferences, inspiring the growth of ecofeminist organizations and actions..."

   It combines eco-anarchism or bioregional democracy with a strong ideal of feminism. The leaders of the movement argue that a strong parallel exists between the oppression and

subordination of women in families and society and the degradation of nature through the construction of differences into conceptual binaries and ideological hierarchies as higher-ranking categories over objects classed into lower-ranking categories (e.g. man over woman, culture over nature, white over black). Besides this, a triple domination of the Global South or the Third World, of poorly resourced peoples and of nature is the fundamental paradigm on which ecofeminist analysis takes place.

As a social movement, ecofeminism varies from nation to nation on the points of emphasis and social paradigms for sociological analysis. Thomas- Slayter and et.al (1995) present a case of Kenya where male ownership of land has led to a dominant culture of patriarchy, manifesting itself in food export, over-grazing, the exploitation of common people, and finally landing in an abusive land ethic with monetary values. They pointed out that the capitalist driven export economy had converted the agriculturally productive land to monoculture cash crops leading to the intensification of pesticide use, resource depletion and finally relocation of subsistence farmers, especially women, to the hillsides and less productive land. This dislocation has intensified both deforestation and soil erosion, furthering the environmental degradation degrading fertility and productivity. The degradation of women and the degradation of nature go hand in hand.

Another perspective of ecofeminist attitude might be visible in the social analysis of Indian ecofeminist Vandana Shiva(1988). She questions the dubious coupling of feminine fecundity with that of land as passive receptacles waiting to be cultivated. She redefines the mission of feminism to set right the perverted vision of modern societies to look down at productivity both of women and nature leading to exploitation. She draws a picture of a stream in a forest, for example, the beautiful rivulet remains unproductive though fulfilling the needs for water of families and communities. As part of planning, engineers come along and tinker with it, collecting the water through a dam and using it for generating hydropower. The same story is repeated for a forest unless it is planted with a monoculture plantation of a commercial species. A forest may very well be productive, protecting groundwater, creating oxygen, allowing villagers to harvest fruit and fuel. It might provide craft materials and create a habitat for animals that are also a valuable resource. However, for the capitalist planners, if it is not for export or contribution to GDP, without a dollar value attached, the forest remains unproductive.

A slightly different perspective is visible in the case of Nariva Swamp issue in Trinidad and Tobago where the editors, Irene Diamond and Gloria Orenstein lay out three strands in ecofeminism in "Reweaving the World: The Emergence of Ecofeminism (1990) (quoted in Mack-Canty, 2004). One strand emphasizes that social justice has to be achieved in harmony with the well-being of the Earth since human life is dependent on the Earth. Another strand in ecofeminism is spiritual, emphasizing that the Earth is sacred unto itself. A third strand insists the necessity of sustainability—a need to learn the many ways people can walk the fine line between using the Earth as a resource while respecting the Earth's needs. MacGregor (2004) writes that a focus on women acting on "survival" or "subsistence" imperatives erases moral choice and practices of making principled decisions to act, or not to act, in particular ways by focussing solely on "the view from below"; the moral insight that comes out of so-called unmediated experiences of survival. He further states the problems that arise from the lack of acknowledgement that many of the women who are romanticized as exhibiting a "subsistence

perspective" or "barefoot epistemology", do so in conditions that they did not choose and that "lifestyle" does not necessarily determine human morality.

**Key-concepts**

As a movement, Ecofeminism upholds certain key principles, although the emphasis on these points may vary from person to person. The movement upholds that the oppression of women and the domination of Nature as interconnected phenomenon and  conceptual binaries and ideological hierarchies as higher-ranking categories and lower-ranking categories (e.g. man over woman, culture over nature, white over black) are the tools of oppression and exploitation. They also demand an exalted position for women and environmental justice.

Ecofeminists vehemently assert the existence of a link between the oppression of women and the oppression of nature\domination. This interconnectedness of oppression and exploitation is seen to be a key axis of organization, the organizing principle of Western culture. This  dualistic split between nature and culture is considered to be at the heart of Western power relations. This division is most often attributed to Descartes and his thinking that was prevalent during the time of the Enlightenment; but Plumwood (1993) traced its roots back as far as to Plato and Aristotle.

Another basic concept is the division by binaries and ideological hierarchies paving way for discriminatory stratification of beings as higher and lower. The ecological crisis cannot properly be addressed  without reference to differences between entities in a hierarchical fashion. The logic of domination is implicated in this discrimination and oppression on the grounds of race, sexual orientation, class, species and gender.

Women hold an exalted position and often likened to be more akin to nature than culture, to body rather than to mind, to the primitive rather than to the civilized. This vision criticizes the so called superior position for the role of reason and consciousness, coupled with an increasing admiration of those powers within male constructed culture. This pseudo superior vision had removed 'soul' from nature and enabled men to regard it as a resource, an entity devoid of autonomy or agency, open to man's plundering.  They give a central place for values of care, love, trust, and appropriate reciprocity.

It emphasizes environmental justice to a far greater degree than

Deep Ecology. Arne Naess coined the term "deep ecology," to

characterize an emerging social movement that questions the

normative and descriptive premises that underlie and constitute individuals and societies. All things, according to deep ecology, matter in and for themselves as they have intrinsic value. One strand of ecofeminism underlines that social justice has to be

achieved in harmony with the well-being of the Earth since human life is dependent on the Earth. Another strand in ecofeminism is spiritual, emphasizing that the Earth is sacred unto itself.

The Link Between Women and Nature: As we mentioned earlier, the pivotal position of the movement is the unique link between women and nature. There are three distinct positions as to whether or not the link exists in the first place. Writers such as Biehl (1991) argue that such a connection between women and nature is entirely a social construction and that men have just as much access to 'nature' as women do. Others, such as (Prentice 1988) take an opposing view, that indeed, women and men's gender behaviours are completely biologically determined, and women are indeed, closer to nature as a result of their reproductive capabilities, something to which men can never approach. Writers such as Plumwood (1993) Warren (1987) and Ynestra King (1989) take a mid-lying position, suggesting that women's reproductive capacity does indeed influence the position from which they experience their world, but it is historically and culturally determined. Furthermore, they hold that both men and women are part and parcel of nature and of culture.

Another balanced view also remains prominent in the movement as an antidote to heal the hierarchical split constructed by patriarchy. An approach to overcome the hierarchical dualism is to recognize each other in their proper perspective. As Plumwood writes: "Overcoming the dualistic dynamic requires recognition of both continuity and difference; this means acknowledging the other as neither alien to and discontinuous from self nor assimilated to or an extension of the self" (Plumwood, 1993: 6). So It is more pluralistic and attempts to maintain distinctive voices against any sort of homogeneity.

**Classification:**

The pluralistic approach of the movement paved way for further proliferation emphasizing one or other distinct voice and ideas. Each strand gradually attained their own divergent views with certain theoretical prepositions and social commitments. One can easily identify different types of ecofeminism

and their favoured social analysis. The leading groups are Cultural/Radical feminism, Materialist Social ecofeminism, Idealist Social ecofeminism and Resistance ecofeminism.

The Cultural/Radical feminism, is also known by other names as ecofeminist spirituality or essentialist ecofeminism. They resolutely propagate that  women have a special relationship with nature by virtue of their biological role. By resorting to the traditional practice of  Earth goddess worshipping and  non-hierarchical matriarchies they assert their claim. They also trace their identity through the  Idea of female/women's culture drawing on ancient myths, concerned with the body, flesh,  natural processes, emotions and finally on subjective feelings.  Their social analysis naturally goes against patriarchy and finds fault with  male oriented culture. They advocate the liberation of Nature  from the repressive male ethos imposed on it for centuries. It is the duty of each woman to discover her authentic nature and celebrate it. As women are part of the eternal cycle of birth, growth, maturation, which flows through them following phases of the moon, rhythm of seasons , they retain the unique connection between women and nature. These essential features as biological characteristics  enable them to retain this indisputable status.

The Materialist Social Ecofeminism is also known as  socialist/anarchist ecofeminism. The political overtones of the movement capture the upper hand in this strand. They trace the exploitation of nature through historical analysis and relates it to exploitation in society emphasizing social and political rather than personal aspects of domination of women and nature. It is held that the general  nature of both men and women  is  a political/ideological category, a social construct. Besides, women's oppression is closely interwoven with class, race and species oppression and the establishment of socialism would end all kinds of oppression. They make use of  the  material world of production, means of production and relations of production, as tools of  social analysis. The ennobled position of motherhood, in the capitalistic society undergoes change and challenge under the onslaught of profit. Finally  women and men will have different standpoints and different lived experiences in the capitalist relations of Western societies.

The third group is known as  Idealist social ecofeminism who finds fault with ideology, hegemony and discourse in creating and retaining value system of each generations. The very notions of knowledge, culture and prevalent ideas hold sway over the relationship between man and nature. It argues that a particular approach to knowledge , a set of ideas rather than any economic and social arrangements is responsible for actions detrimental to nature. It is argued that the underlying values of society must be reshaped, the prevailing ideas  are held to stem from the hierarchical organization and domination.

Another noticeable group among ecofeminist is called Resistance Ecofeminism with a limited perspective concentrating on problems of women in the developed world in the modern times.

They pay due importance to political considerations as the concept of power has become so prominent. They carry on the activities of green politics and other ecological movement to resume the vitality of the mother earth with a concern about the impact of human activities on the non-human world. As the maladies of modernization become a reality, the movement rejects it. They also criticize Western lifestyle choices, such as consuming food that has travelled thousands of miles and playing sports (such as golf and downhill skiing) which inherently require ecological destruction.

Some ecofeminists point to the linguistic links between oppression of women and land, through such literary terms like, "rape the land", "tame nature," and "reap nature's bounty" and so on. Terms also express nature as feminine (using the pronoun "she" and the term "Mother Nature") and women as "wild" and "untamed" (like nature). These terms are also highly derogatory and contemptuous.

**Elements of disproportion\critique**:

One of the most common elements of critique levelled against ecofeminism is the idealist position on the mystical interconnection between women and nature. Feminist and social ecologist Janet Biehl criticized ecofeminism as idealist. Its claim on a mystical connection with nature at the expense of realistic analysis of the deplorable conditions of women makes it idealist. The Cultural essentialist ecofeminism bears the brunt of this observation. However, this line of criticism may not apply to many ecofeminists who reject both mysticism and essentialist ideas about the connection between women and nature.

The anti-essentialist ecofeminism has become more prominent since the early 1990s. It has an epistemological analysis of the Enlightenment and places the spirituality in immanent world. But this kind of ecofeminism advocates modern activism as its social praxis. They fail to justify this epistemological analysis based on theoretical side on one side and the bare materialist activism on the other side. There are different schools of feminist thought and activism that relate to the analysis of the environment. This relationship can be argued from an essentialist position, attributing it to biological factors, or from a position that explains it as a social construct. Vandana Shiva claims that women have a special connection to the environment through their daily interactions with it that has been ignored. "Women in subsistence economies, producing and reproducing wealth in partnership with nature, have been experts in their own right of holistic and ecological knowledge of nature's processes. But these alternative modes of knowing, which are oriented to the social benefits and sustenance needs are not recognised by the capitalist reductionist paradigm, because it fails to perceive the interconnectedness of nature, or the connection of women's lives, work and knowledge with the creation of wealth." (Staying Alive: Women, Ecology and Development 1988). Thus the school faces the charge of unholy alliance between essentialist stand point and socialist analysis.

The materialist ecofeminism discusses economical and political issues and practises social analysis on the society to identify the divergent defects. While the movement engages in political activism it holds the metaphorical proposition like the link of *Great mother earth* or Gaia . The mysterious phenomenon that the earth is really alive and so on and so forth fails to hold good under the application of materialist yardsticks. These predilections somehow erode the materialist foundations.

The comprehensive vision envisaged by ecofeminism by coupling gender and environmental issues does have positive impact yet it somehow simplifies the crucial issue of gender without addressing it in the proper manner. It is argued especially by Vandana Shiva (1988) that gender is a relevant factor in determining access and control of natural resources. Besides, it is closely related to class, race, culture and ethnicity to transform the environment and to achieve the community's opportunities of sustainable development.

Technology Vs Primitivism is another case in point. Françoise d'Eaubonne had identified alienation as one of the maladies of modern technology and prescribed a cooperative alternative in small groups in villages with automation in a limited way. As these proposals were put into practice along with ecofeminist ideals and pagan practices, common people did not find favour with it. Somebody even accused it of primitivism. Her projects are sometimes seen as a form of primitivism. However, the real bone of contention remains in the movement regarding the role of technology and its consequent alienation. while some ecofeminists see technology as inherently alienating, many see a substantial role for modern technologies in the creation and operation of such villages. In the final analysis, a major number of the group stand for the use of technologies such as solar power, which they regard as more important than relying upon poisonous industrial processes or materials. The ecological movement is itself split on issues like this. However, it is likely that an intermediate technology, an appropriate technology suitable to the place, would be preferred in general if an ecofeminist movement would spread into developing nations quickly.

Vegetarianism is another virtue arbitrarily advocated by the movement. One strand of ecofeminism, associated with Carol J Adams, Marti Kheel and Greta Gaard has consistently argued that veganism is an important part of ecofeminist ethics. Other positions represented by Val Plumwood and Karen J. Warren argue for a contextual vegetarianism which ties animal ethics more to material and social context.

**Conclusion**

Ecofeminism, both as a social and political movement, has come a long way from its inception in 1974. Its unique stand over the oppression of women and the domination of Nature as interconnected phenomenon and various social analysis as part of praxis have earned it many strong votaries through out the world. Many look to it as a potential movement to set right many

long pending social and political issues. But the expectations of its devotees are too high for the movement as it is yet to address theoretical incongruities coupled with dissimilar practical considerations. The divergent branches of the movement are yet to undertake a homogeneous approach to the basic issues. Despite all these shortcomings, ecofeminism seems to obtain a longer innings with comfortable dividends.

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# RECONSTRUCTION OF HIGGS BOSON FROM THE DECAY PARTICLES

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**Abstract**

In this paper, we considered the channel gg → H → $W^+ W^-$ to simulate the proton-proton collision process at 8 TeV which is the current set up at LHC (Large Hadron Collider). We generated the collision events and reconstructed momentum, energy and mass of Higgs boson from its decay products W+ and W-.

## 1. INTRODUCTION

According to particle physics, elementary particles and forces give rise to the world around us. The Higgs boson or Higgs particle is an elementary particle which is suggested to give mass to matter. The decades-long search for the Higgs boson finally led to the construction of one of the most expensive and complex experimental facilities to date, the Large Hadron Collider, the world's largest and highest-energy particle accelerator which is able to create Higgs bosons and study its characteristics. [1]

The LHC was built by the European Organization for Nuclear Research (CERN). It consists of a 27-kilometre ring of superconducting magnets with a number of accelerating structures to boost the energy of the particles along the way. LHC started working on 10th September 2008 and first collisions took place 30th March 2010 between two 3.5 TeV beams, setting a world record for the highest-energy man-made particle collisions at that time. A new boson was announced on July 2012 and after further studies the Higgs boson was confirmed to be produced at the Large Hadron Collider (LHC). [2]

Higgs is a boson with positive parity, no spin, electric charge, or color charge. It is also very unstable, decaying into other particles almost immediately. Quantum mechanics predicts that if it is possible for a particle to decay into a set of lighter particles, then it will eventually do so. This is also true for the Higgs boson. The LHC was operated at 4 TeV per beam until the end of 2012. After the LHC's 2015 restart it is planned to operate at energies of 7 TeV per beam.

## 2. THEORY

In order to simulate and study the decay process of Higgs, we use two computing packages Pythia (Version 8.1) and ROOT (Version 5.34.04) [3][4].

The Pythia program is a standard tool for the generation of high-energy collisions. It contains a library of different particle interaction processes. It also has a set of utilities and interfaces to external programs such as ROOT. While previous versions were written in Fortran, Pythia 8 and after versions represent a complete rewrite in C++. It does contain some new physics aspects that should make it an attractive option especially for LHC physics studies.

ROOT is an object-oriented framework, born at CERN, at the heart of the research on high-energy physics aimed at solving the data analysis challenges of high-energy physics. It is multi platform software and based on the C++ language. It can handle large files (in GB) containing histograms and it is open source.

For our study we considered Higgs to be produced only from gluon-gluon fusion and decays only to W+ and W-. This ensures the data analysis to be simple and handy. Consider the decay process of Higgs H $\rightarrow$ W$^+$W$^-$

According to the conservation laws the momentum and energy must be conserved in the decay process. Clearly the momentum before and after the decay must be equal.

That is, if $P_X$, $P_y$ and Pz correspond to the momentum in x-axis, y-axis and z-axis respectively, then

$$P_X(H) = P_X(W^+) + P_X(W^-)$$

$$P_y(H) = P_y(W^+) + P_y(W^-)$$

$$P_Z(H) = P_Z(W^+) + P_Z(W^-)$$

Also if E corresponds to energy, then

$$E(H) = E(W^+) + E(W^-)$$

From Einstein's special theory of relativity, the total energy, rest energy and momentum of a particle are related as $E^2 = (mc^2)^2 + p^2c^2$ where E is the rest-energy, m is the rest-mass and p is the total momentum of the particle and c is the velocity of light. Considering the natural units, we take c as unity.

So the equation can be written as

$$E^2 = m^2 + p^2$$

$$\text{or} \quad m^2 = E^2 - p^2$$

$$\text{or} \quad m = \sqrt{E^2(H) - P_X{}^2(H) - P_y{}^2(H) - P_Z{}^2(H)} \qquad\qquad \text{..............(1)}$$

Or

$$m = \sqrt{[E(W^+) + E(W^-)]^2 - [P_X(W^+) + P_X(W^-)]^2 - [P_y(W^+) + P_y(W^-)]^2 - [P_Z(W^+) + P_Z(W^-)]^2}$$

Calculate the mass of the Higgs boson from the properties of its decay products (Here, W+ and W-) using equation (1) . Also it is possible to find out the properties of W particles from its decay products and so on.

Thus we can reconstruct various properties of all the unstable particles from their stable mother particles. This is the basic principle of LHC.

The different stages of our study are given below.

1. Switched off all Higgs productions except via gluon-gluon fusion.

2. Set the centre of mass energy of the proton-proton collision as 8 TeV.

3. Switched off all Higgs decay processes except through W+ and W-.

4. Assumed that all the W+ and W- productions are from Higgs decay.

5. Identified W+ and W- from the particle loop using particle id and reconstructed momentum and energy of Higgs from W+ and W-.

6. Calculated the mass of Higgs from the reconstructed momentum and energy.

## 3. Results and Discussion

The events were successfully generated using Pythia. The data was analyzed using ROOT and then the histograms were plotted.

### Higgs : X-Momentum

| 1 | |
|---|---|
| Entries | 5000 |
| Mean | 27.6 |
| RMS | 36.8 |

GeV/c →

### Higgs : Y-Momentum

| 2 | |
|---|---|
| Entries | 5000 |
| Mean | 27.83 |
| RMS | 36.67 |

GeV/c →

### Higgs : Z-Momentum

| 3 | |
|---|---|
| Entries | 5000 |
| Mean | 220.2 |
| RMS | 227.7 |

GeV/c →

### Higgs : Energy

| 4 | |
|---|---|
| Entries | 5000 |
| Mean | 287.9 |
| RMS | 207.3 |

GeV/c →
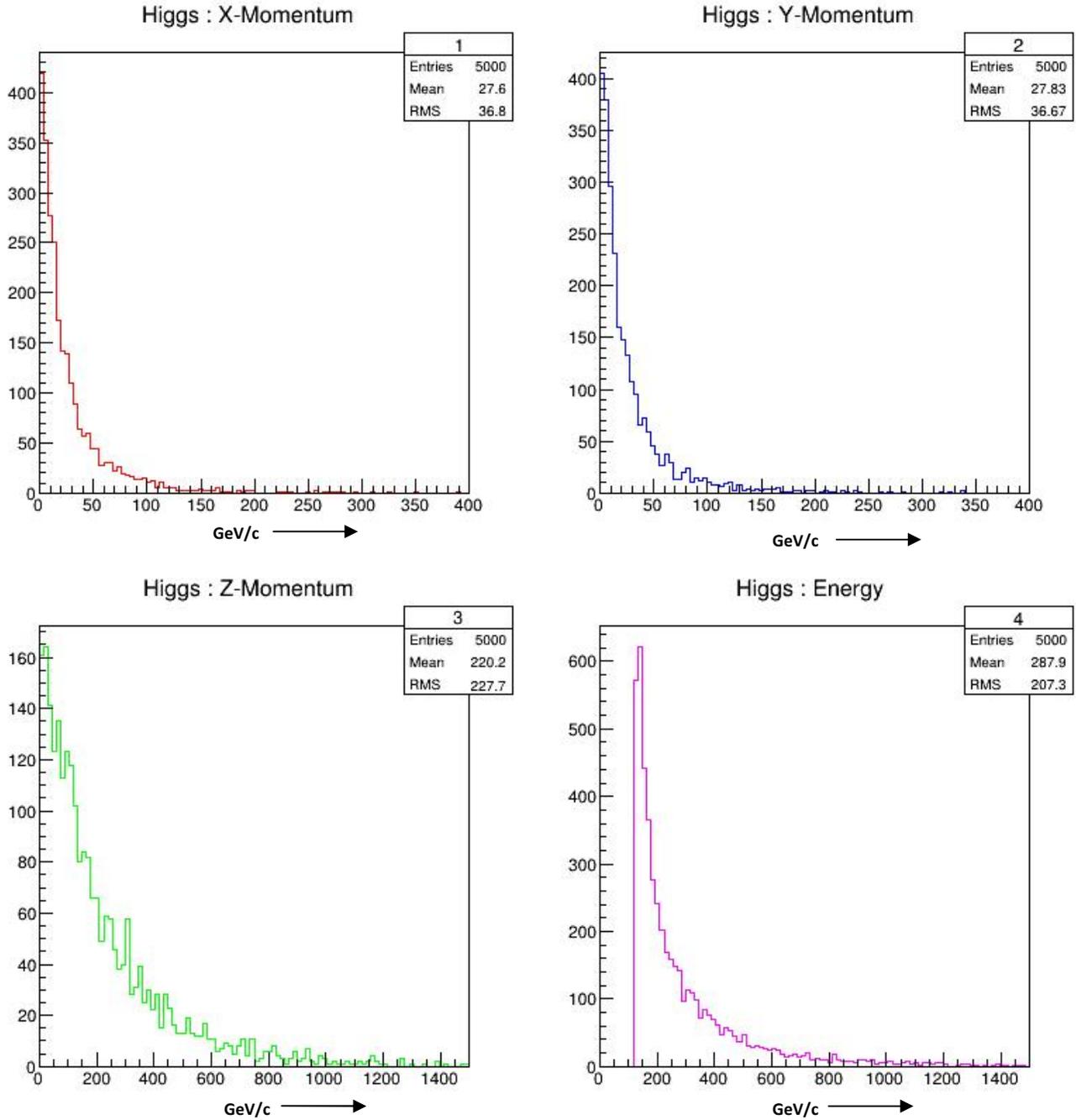
We considered 5000 events (p-p collisions) for our simulation. The below graph shows the momentum components ($p_x$, $p_y$, $p_z$) and energy were for the decay particles W+ and W- . The mass of

Higgs was also calculated using equation (1). There is a significant difference of distribution of $p_z$ compared to $p_x$ and $p_y$. This may be due to the fact that the direction of proton beams is along the $z-$axis. It is observed that no higgs boson was created with a energy lower than 175 Gev/c.

### 4. Conclusion

Using the event-generator and data analysis programs we successfully reconstructed the momentum, energy and mass of the Higgs boson from its decay products, W+ and W-. It also suggests that we can reconstruct different properties of most of the unstable decay particles from their stable mother particles.

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# Corporate Sustainability Reporting Practices: A Comparative Study of Practices by Indian and European Companies

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## Abstract

*Over the years the methods which render value to companies have undergone a sea change. In the fast changing globalized economy, where companies face edge to edge competition, sustainable practices like economic, social and environmental practices, which is termed as the ' triple bottom line practices' play a major role in creating value to the company. Very few sustainable practices have been covered under the mandatory and regulatory regimes all over the world. Despite these regulatory limitations, an increasing number of companies are voluntarily opting to include information regarding sustainability practices either through a special report or in addition to their annual reports. The narrative reporting on sustainability has not yet been regularized by the different accounting bodies, but to attain competitive edge in the market, increasing number of companies are voluntarily disclosing information on sustainability in the corporate reporting.*

*Corporate reporting has gained wider scope from purely financial or accounting in the past to sustainability reporting recently. Reporting on sustainability practices  began to develop from the year 2000. Being in a nascent stage, companies do  sustainability reporting  on a voluntary basis since it is not made mandatory in many of the countries. So there is no single, universally accepted principle on Sustainability Reporting. The most widely followed corporate sustainability reporting guidelines are the Global Reporting Initiatives' G3 Guidelines. The GRI Guidelines defines Sustainability Reporting as.....'the practice of measuring, disclosing and being accountable to internal and external stake holders for organizational performance towards the goal of sustainable development'.(KPMG Report, 2008).  The stakeholders are increasingly interested in understanding the approach and performance of companies in managing the sustainability (environmental, social and economic) aspects of their activities, including their potential for value creation. The value of a company is impacted by the quality of*

*its relationships with a range of internal and external stakeholders. The ability of a company to communicate effectively with its key stake holders can be critical to its long term success, viability and growth. Advantages associated with an effective sustainability response (and associated reporting) may include aligning with and capitalizing on stakeholder values, pre-empting stakeholder action, sustaining the value chain and capturing operational efficiencies. (KPMG Reports, 2008). From a stakeholder perspective, the publication of sustainability reports (be they For Eg. Web based reports, data tables, and/or hard copy publications) provide an avenue to benchmark and assess performance with respect to laws, norms, codes, efficiency standards and voluntary initiatives. Reporting also demonstrates how the company influences and is influenced by expectations about sustainable development. Stakeholders can compare performance of companies among and between over a period of time.*

*This study attempts to examine the sustainability reporting practices of top Indian and European companies. This study examined and compared the various sustainability disclosure practices of the top Indian and European companies for a period of one year, i.e., 2011. The study explores the type and extent of information on sustainability being disclosed by the companies with the help of a disclosure Index. The index of disclosure of sustainability used in this paper consisted of an extensive list of 99 items, as voluntary disclosure items. The study reveals that European Companies have attained remarkable improvement in the sustainability reporting practices where as Indian companies need to improve in their reporting, though some companies have attained considerable progress in their sustainable reporting.. On the basis of the results, it can be suggested that Indian companies need to improve in their disclosure practices on sustainability. Secondly, the accounting authorities should endeavor to regularize narrative reporting on Sustainability*

Key words: Sustainability reporting, stakeholders, performance measurement.

**Introduction**

The emergence of the information era in the last decade of the twentieth century led business to operate in a challenging market place that is rapidly changing, evolving complex, moving global, hypercompetitive, and intensely stakeholder-focused. The organization responded to these pressures of information age in a unique manner. There is a greater understanding that corporate strategy can be crafted to encompass a larger picture that not only enhances competitiveness but also ensures responsible and sustainable growth. It is important that such initiatives are encouraged through stakeholder awareness and response. No longer, can companies gain sustainable competitive advantage by merely monitoring efficient allocation of tangible resources like physical assets and excellent management of financial assets and liabilities. A key purpose of Sustainability Reporting is to assist organizations, both large and small, in identifying the cross-cutting dimensions of triple bottom line performance and in understanding the process that the organizations can start to measure, report and improve the business decisions. The effort is to create sustainable value for the organization and its stakeholders. Sustainability value is the ability to grow in the long run by synthesizing with the natural, social and human capital including intangible assets such as management skills, reputation, human and intellectual capital, and the assets are often excluded from the balance sheet. Globally, there is a growing trend towards business providing economic, environment and social information into the public domain through Sustainability Reports. It has been internationally recognized that sustainability reporting leads to improved business performance through communication of information with stakeholder groups like customers, suppliers, employees, financial institutions, regulators and communities on a company's economic, environmental and social management and performance. (Roopinder Oberoi, 2012).

Companies are viewing sustainability issues through a strategic lens, according to a recent survey done by Earnest & Young in Cooperation with Greenbiz Respondents  - Executives from 24 industrial sectors -  indicated that the top five factors driving corporate sustainability initiatives are Energy cost reduction ( 93%), changes in customer demand(87%), brand risks (87%), increased stakeholder expectations (86%), and competitive threats (81%). Investors and consumers are placing strong pressure on companies to consider the 'triple bottomline' of

environmental, social and economic performance, both in terms of specific company and across the supply chain. (Ernest & Young).

Sustainable development is a fluid concept and various definitions have emerged over the past two decades. The origin of the term SD lies in the 18th century but it was at the 'Club of Rome precipitated an international discussion due to its report "Limits to Growth". (Meadows, 1972). In the course of this discussion, an eco-development approach was emerged which effected the protection of resources and environment coming to the fore. In 1987, the world commission on Environment and Development defined SD as an ethical concept and it has become the major definition of SD. Accordingly Sustainable Development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts; the concepts of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the State of technology and social organization of the environments ability to meet present and future needs. This paper documents an investigation into the reporting practices for sustainability by the top Indian and European companies with the objective of understanding and comparing their disclosure practices over a period of time.

**The Background of Sustainability Reporting**

In contrast to financial reporting, the history of sustainability reporting (SR) is comparatively recent. The proposition that organizations, and business organizations in particular, should supplement their financial accounting with accounting on their environmental, social and other 'non-financial' performance – or 'sustainability reporting' – first emerged in the 1990s. At the time of the 1992 UN Conference on Environment and Development (UNCED), relatively few companies engaged in SR in any form. Responding to the increasing media attention to environmental problems, most reports focused on environmental policies and performance.

While calls for SR initially stemmed mainly from advocacy groups and investors, as well as some business leaders, governments played a historic role in formally recognizing the importance of this new dimension of reporting. It is often overlooked that environmental reporting was specifically recognized by the world's governments in Agenda 21, one of the main outcomes of the UNCED conference. There it was agreed that *'business and industry, including*

*transnational corporations, should be encouraged to report annually on their environmental records, as well as on their use of energy and natural resources'.* (UNCED conference, 2002)

In the decade between UNCED and the 2002 World Summit on Sustainable Development (WSSD), a number of initiatives were undertaken to explore and advance SR. Among these the most notable was the Global Reporting Initiative (GRI). Launched first in 1997 as a pilot project, it was a multi stakeholder initiative to design a framework that could make reporting on an organization's economic, social and environmental performance as routine and accepted as financial reporting.

When GRI was officially launched in April 2002, around two hundred pioneering companies were using the GRI framework to report annually on their sustainable development policies and practices. By the time of the WSSD, the concept had sufficiently matured for governments to formally recognize both SR and the role of GRI. In the Johannesburg Plan of Implementation, they noted that enhancing corporate environmental and social responsibility and accountability could be achieved by *actions at all levels to: (a) encourage industry to improve social and environmental performance through voluntary initiatives, including environmental management systems, codes of conduct, certification and public reporting on environmental and social issues, taking into account such initiatives as the ISO standards and Global Reporting  Initiative guidelines on sustainability reporting....(GRI Reporting, 2011)*

It should be noted that the decision to pursue a voluntary approach to SR at this point was not universally supported. There were many in the non-government organization (NGO) community who argued that effective corporate transparency and accountability could only be achieved through binding national legislation based on an international treaty. This argument did not prevail for a number of reasons, including the fact that financial reporting, while not voluntary, was largely based on standards developed by professional associations, and not legislation. The decision was made, instead, to explore the potential and flexibility of voluntary SR reporting, recognizing that it was still a very new field, where agreement still needed to be forged on the relevant issues and metrics.

By the beginning of 2012, it is clear that the concept of SR has become firmly lodged as a desirable and increasingly mainstream practice in key sectors worldwide. The underlying

proposition of SR is that progress towards a Green Economy and sustainable development cannot be made unless information is disclosed on the economic, social and environmental impacts and performance of business and other organizations. It appears to be widely recognized that, together with financial information, sustainability information is essential if regulators, companies, investors and the wider community are to be able to measure and understand an organization's contributions to sustainable development. (The future of sustainability reporting, Paul Hohnen, 2012)

**Key drivers of Sustainability Reporting**

**Regulators**: Governments at most levels have stepped up the pressure on corporations to measure the impact of their operations on the environment.

**Customers**: Public opinion and consumer preference are a more abstract but powerful factor that exerts considerable influence on companies, particularly those that are consumer-oriented.

**NGOS and the media**: Public reaction comes not just from customers but from advocates and the media, who shape public opinion.

**Employees**: Those who work for a company bring particular pressure to bear on how employers behave; they, too, are concerned citizens beyond their corporate world.

**Investors**: Increasingly, investors want to know that companies they have targeted have responsible, sustainable, long term business approaches. (GRI, 2011)

**Research Methodology**

**Universe and Sample of the Study**

The top 50 companies ranked on the basis of revenue in the 'Compendium of Top 500 Companies in India constitute the universe of the Indian Companies, where as the top 50 companies ranked on the basis of revenue in the Fortune Global 500 European Companies constitute the universe of the European companies. First 50 most valuable companies of India in the Compendium of Top 500 Companies in India, 50 European, companies listed in the Fortune Global 500 World's largest Corporations constitute the sample. Banking, Insurance, and financial companies have been excluded from the purview of this paper because such companies need to follow different disclosure requirements from country to country.

**Sources of Data Collection**

Published annual reports and sustainability reports of the companies happen to be the primary sources of data. Annual reports of the European and Indian Companies are collected from the websites of the companies. Annual Reports of some of the Indian and European companies were obtained after sending e-mail requests and registered letters at their respective addresses. The rest were downloaded from their respective websites of the companies..

**Period of the Study**

The corporate annual reports and Sustainability Reports of the Indian and European Companies have been collected during the fiscal period 2010 - 2011.

**Scope of the Study**

The Scope of the Study is limited to the disclosure in the Annual Reports as well as the Sustainable Development Reports of the Indian and European companies. Knuston (1993) suggested that annual reports are typically the most important source of information for most analysts. In addition, Lang Lundholm (1993) found a high, positive correlation between annual report disclosure and other disclosure in other sources (such as press releases or regulatory filings). The study explores whether the company releases a separate Sustainability reports or just includes these in the annual reports only.

**Disclosure Index**

A Disclosure Index is used to examine whether corporations engage in disclosure practices of particular information in annual Reports or Sustainability Reports (Marston and Shrives, 1991). Many researchers have utilized a disclosure index for examining the disclosure practices of various aspects like intangibles, Risk related information etc. The index of disclosure on sustainability used in this paper consists of an extensive list of items as per the GRI (Global Reporting Standard), applicable to a wide range of users, which appear in an Annual Report/sustainability Reports. The Index includes voluntary disclosure items.

**Classification of Disclosure Index Items**

A.  Economic Performance Indicators

    A1. Economic Performance            4

    A2.Market Presence            3

    A3.Indirect Economic Impacts            2

    A4.Risk related Disclosures            6

B.  Environmental Performance Indicators

    B1: Materials            2

    B2:Energy            5

    B3:Water            3

    B4: Biodiversity            5

    B5: Emissions, Effluents and Waste            10

    B6: Products and Services            2

    B7: Compliance            1

    B8: Transport            1

    B9: Overall            1

C.  Social Performance Indicators

    C1: Employment            4

    C2: Labour/Management Relations            2

    C3:Occupational Health and Safety            4

    C4: Training and Education            3

    C5: Diversity and Equal Opportunity            1

    C6: Equal Remuneration for Women and Men            1

D.  Human Rights Performance Indicators

    D1: Investment and Procurement Practices            3

    D2: Non Discrimination            1

    D3: Freedom of Association and Collective Bargaining            1

    D4: Child Labour            1

    D5: Forced and Compulsory Labour            1

    D6: Security Practices            1

    D7: Indigenous Rights            1

|                                                      |   |
|------------------------------------------------------|---|
| D8: Assessment                                       | 1 |
| D9: Remediation                                      | 1 |
| E. Society Performance Indicators                    |   |
| E1: Local Communities                                | 3 |
| E2: Corruption                                       | 3 |
| E3: Public Policy                                    | 2 |
| E4: Anti competitive behaviour                       | 1 |
| E5: Compliance                                       | 1 |
| F. Product Responsibility Performance Indicators     | 9 |
| F1: Customer Health and Safety                       | 2 |
| F2: Product and Service Labeling                     | 3 |
| F3: Marketing Communications                         | 2 |
| F4: Customer Privacy                                 | 1 |
| F5: Compliance                                       | 1 |

Source: GRI Index

Disclosure Index can be assigned either weighted or unweighted scores. A lot of controversy exists on this issue. A number of researchers have made use of the weighted disclosure index where items have been assigned weights according to either the importance or the type of disclosure (Bergamini and Zambon, 2005; Kang, 2006). On the other hand, Williams (2001) and Citron, *et al* (2005) used unweighted index giving equal importance to all the disclosure items. The argument given by them is that annual reports are read by a wide variety of users and each class of user will attach different weights to an item. As a result, weighted index involves the issue of subjectivity. Further, Robbins and Austin (1986) found that using a weighted disclosure index does not materially affect the results of possible determinants of disclosure. This view is also supported by Cooke (1989) and Firth (1980). This paper uses the unweighted index as the use of unweighted dichotomous index reduces subjectivity involved in determining the weights of each item (Williams, 2001; Ahmed and Courtis, 1999; Courtis, 1986). The disclosure item is scored as one (1) if it is disclosed in the annual report or zero (0) if it is not disclosed in the annual report. Thus, the total disclosure score in terms of number of items being disclosed is

determined. This total disclosure score has been converted in percentage terms by applying the following formula:

Total number of items appearing in the annual report

---------------------------------------------------------------------------------  X100

Maximum number of items which should appear in annual reports

**Technique for Analysis of Information Sustainability Reports**

The websites of Indian companies and European companies were scanned for sustainability reports and they were downloaded. All the organizations which published their sustainability reports had put them up on their websites and none of the companies contacted for sustainability reports replied affirmatively about their release of sustainability in the hard form. These reports were then scanned through to analyse the quantity and quality of sustainability related information. Quantity of sustainability communication were measured through the number of pages and the number of words in the report and analysed if the Index given by GRI is present in the report. An analysis has also been done with regard to the Length of the report, color of the report, visuals used etc.

**Status of SR Indicators – Indian Companies vis-a-vis European Companies**

Table.1

| Reporting Indicators | No of Companies Disclose (%) | |
|---|---|---|
| | India | Europe |
| 1. Economic Performance | 36 | 64 |
| 2. Environmental Performance | 54 | 66 |
| 3. Social Performance | 50 | 50 |
| 4. Human Rights Performance | 60 | 48 |
| 5. Society Performance | 58 | 67 |
| 6. Product Responsibility | 61 | 66 |

**Sustainability Report Analysis**

Table .2

| | India | | | Europe | |
|---|---|---|---|---|---|
| **Parameters** | **Total No 50** | **Average** | **Parameters** | **Total No 50** | |
| **Publishes Report** | | | | | |
| Yes | 25 | 50.00% | 42 | 84.00% | |
| No | 25 | 50.00% | 8 | 16.00% | |
| Length of the Report (Pgs) | 1480 | | 1680 | | |
| **Coloured** | | | | | |
| Yes | 25 | 100% | 42 | 100% | |
| No | 0 | | 0 | | |
| Colours used | 24 | 96% | 40 | 95% | |
| Most used colour | Green (14) | 56% | Blue (18) | 42.85% | |
| Visuals | 208 | 14.05% | 557 | 33.15% | |
| No of Companies With GRI Index | 18 | 72.00% | 42 | 84% | |
| **Total Disclosure Score** | **1175** | **72%** | **2730** | **84%** | |

The number of Indian companies publishing sustainability reports is very low. About 50 per cent of Indian companies studied release a separate sustainability report as against 84 per cent of European companies. The reason for few Indian companies publishing sustainability reports is that corporate environmental reporting is voluntary. The total disclosure score for Indian company is 72% and the European Company is 84%. European companies have included more

visuals and colours than Indian companies. Both Indian and European annual reports contain information related to environment, social responsibility and economic activities. It is important to note that though there are many Indian companies which publish sustainability reports, which do, match the European in their content and inputs.

**Scope for further research**

Further research can be conducted based on the sustainability reports of various countries and various regions etc. Researchers also can make a study of the sustainability reporting practices and see if there is any relationship with financial performance.

**Conclusion**

The goal of sustainable development is to "meet the needs of the present without compromising the ability of future generations to meet their own needs." As key forces in society, organizations of all kinds have an important role to play in achieving this goal. Yet in this era of unprecedented economic growth, achieving this goal can seem more of an aspiration than a reality. As economies globalize, new opportunities to generate prosperity and quality of life are arising though trade, knowledge-sharing, and access to technology. However, these opportunities are not always available for an ever-increasing human population, and are accompanied by new risks to the stability of the environment. Statistics demonstrating positive improvements in the lives of many people around the world are counter-balanced by alarming information about the state of the environment and the continuing burden of poverty and hunger on millions of people. This contrast creates one of the most pressing dilemmas for the 21st century.

One of the key challenges of sustainable development is that it demands new and innovative choices and ways of thinking. While developments in knowledge and technology are contributing to economic development, they also have the potential to help resolve the risks and threats to the sustainability of our social relations, environment, and economies. New knowledge and innovations in technology, management, and public policy are challenging organizations to

make new choices in the way their operations, products, services, and activities impact the earth, people, and economies.

It is important that insistence on publication of sustainability reports should be made because the internationally accepted format of publishing social information is balanced and ensures that organizations quantify and present detailed information about all categories such as economic, environment, society, human rights, labour practices and product responsibility, each of which appeals to a set of stakeholders. Further there is a scope of self-declaration, third party authorization as well as benchmarking against a standardized set of parameters (GRI Indicators) accepted by the international community which ensures uniformity and credibility upon the disclosed information. The sustainability reports are published under different names and are also known as CSR reports which have the international benchmarking through the GRI guidelines. The Indian companies fall away short against the MNCs in the number of companies which publish sustainability reports primarily because it is not mandatory in India for companies to publish a separate sustainability report. Yet, it is noteworthy that though the number of Indian companies publishing sustainability reports is few but the standards and quality of the published reports match the global benchmarks in terms of content of the report.

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