

# Understanding Sustainability, Sustainable Development and Women's Empowerment: Insights from Anthropology

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**ABSTRACT:** The presidential address suggests re-examining sustainability and empowerment within the development context, particularly amongst the marginalised, especially women. The field of anthropology plays a critical role in furthering the comprehension of indigenous sustainable development, offering valuable insights to scholars and policymakers on a global scale. Anthropologists employ ethnographic methodologies to elucidate how contemporary societies engage with sustainable technologies, offering instructive insights for broader societal applications. Utilising the lens of my specialised discipline, I seek to delineate the progression of these principles and promote a holistic method of studying human beings. This paper aims to critically analyse the integration of sustainable development into the field of anthropology and its implications for comprehending and formulating a sustainable approach to development. The concept of sustainable development goals is widely recognised; however, an anthropological comprehension of these ideals has yet to receive substantial scholarly attention. Including women in Science and Technology is crucial for promoting sustainable development. The examination of gender perspectives is conducted utilising a grassroots approach, and in the context of India, the influence of patriarchy creates barriers for women seeking access to higher education. Furthermore, the field of anthropology plays a crucial role in shaping gender perspectives. The Nagpur Science Congress holds promise for an intellectually stimulating engagement.

## INTRODUCTION

I am thankful to all the participants who have gathered here to enrich this congress of scientific academia I extend a warm welcome to you all to the 'Anthropological and Behavioural Sciences (including Archaeology, Psychology, Education and Military Sciences)' subsection of the 108<sup>th</sup> session of the Indian Science Congress. It is both an honour

and a privilege for me to stand before you all and address the 2023 erudite gathering.

I propose to revisit the ideas of sustainability, and its use in the field of development and empowerment in the case of marginal communities with special reference to women. While tracing the intellectual trajectory of these concepts I use the lens of the discipline in which I am trained and which has come up with a holistic understanding of social phenomena thereby advocating for an integrated approach to studying human behaviour. In this address, I propose to examine how sustainable development is intertwined within the discipline that

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studies humanity as a whole, and how Anthropology can play a significant role in understanding and conceptualizing an approach towards development that drives itself to sustainability. Sustainable development goals are well known today; however, an anthropological understanding of such ideas still awaits serious engagement from scholars.

The term sustainability first originated with Hans Carl von Carlowitz in his German handbook on forest management called *Sylviculture Oeconomica*, published in 1713. He contemplated the idea of systematic reforestation for continuous, steady, and sustainable use (Brightman and Lewis, 2017; Scoones, 2007). Brightman and Lewis propounded that as the ideas of sustainability started to gain the front seat in the global viewpoint, it led to an aggressive beginning of rationalized use and management of resources. Forty-five years back, Thomas Malthus (1798) hypothesized that the population expands at a geometric rate while subsistence grows at an arithmetic rate creating an imbalance. According to him, this imbalance would push the outgrowing population to survive on a minimum or starve with limited resources (Paul, 2008). Although, the evident recent technological advancements have been able to bridge this gap which, in a way has surpassed the principles of demand and supply with the surplus.

Population studies have generated debates on the limits of the path leading to this progress and with unmarked limits, the final stage looks mystified with an obscure future (Mitcham, 1995). The above argument was best illustrated using the theory of biological evolution- living entities had to sense, some had to smell, some had to see, or both, and the more they progress towards a more evolved form they tend to increase the complexities, but mere multiplicity could not be concluded to be more inclusive or better, it just signs the progress (Mitcham, 1995).

Therefore, it could be concluded that technology and science extend toward much betterment but do not imply an apt and ideal future. Thus, the idea pertained to the approach of being limitless. Scholars like Condorcet and Kant who propounded the early modern theory of progress talked about a kind of perfect state but yet it lacked the final point as to what could be such a state that enables man to enter into a stage of balanced growth in the future (Mitcham,

1995). The postmodern scholars, on the other hand, attempted to identify the limit to the progress that came to the forefront with the work of a group called the Club of Rome, which published a book called *The Limits to Growth* in 1972. It was reasoned that, since the population expands exponentially which was more due to the industrial revolution, the result would be an increase in the demand for food, pollution, and resource depletion. Since the earth is a finite resource, this urge for unlimited growth could have been turned into trash. The growth trends for industrialisation and population cannot continue unchanged but if it continues, it could cause a disastrous episode to the future of mankind by probably leading to a collapse of civilisation.

The book *Mankind at the Turning Point* (1974), gave a positive view, stating that growth must be perceived as organic rather than undifferentiated, to rescue the world from its peril of the issue of the “problematique”. Growth was understood in its totality and in holistic terms that would help to create an interdependent society. The idea behind such growth was that society had been an interaction of various aspects such as economy, polity, religion, education, and culture.

These two works were pioneers in the field which shaped the idea that growth needs to be limited to sustain the future and this growth must be all-encompassing the aspects of a society in which mankind thrives. This finally culminated in the idea of sustainable development with a perspective that transformed from the notion of limiting growth to how development can be taken place with sustainability and in an acceptable manner so it does not hinder growth as well as conserve in the upcoming times. This idea matured into a landmark report that was penned in 1987 called the ‘Report of the World Commission on Environment and Development’ called the Brundtland Commission. The focus was on a new dimension, the relationship between the stumbling block of environmental problems and the economic as well as developmental prospects. This for the first time recognized that the accelerating deterioration of the environment and resources had immense potential to have a detrimental effect on economic and social development. This report for the first time defined the concept of sustainable development as “that meets

the needs of the present without compromising the ability of the future generations to meet their own needs “ (Report of the World Commission on Environment and Development, 1987, p. 24).

#### CONCEPT OF SUSTAINABLE DEVELOPMENT: ANTHROPOLOGICAL REFLECTIONS

Gieryn (1999, *cf.* Scoones, 2007) argued sustainability has been a multidimensional concept as it attends to issues from environmental, economic, social, and governance science (as cited in Scoones, 2007). A significant dilemma in the anthropological discourse has been how several connotations regarding the ‘concept of sustainability could be synthesised that go beyond the textual definition regarding the protection and preservation of resources. The idea also examined how resources are geopolitically situated and the scientific intelligentsia needs to reconsider the indigenous and industrial capital (Brightman and Lewis, 2017).

Sustainability attained most of its attention in the 1960s and 1970s with the environmental movement. Sustainability today has been found in almost all discourses of life and has been seen as a notion that guides the developmental aspects surrounding mankind and society. Though the meaning and the conceptual notion of the term were known to everyone yet there was no universally agreed particular and all-inclusive definition. But despite this definitional dilemma, according to Moore (2017), there was a uniform agreement on the fact that the current situation of our planet was moving towards unsustainability because the consumption rate was far beyond what the planet could revive and which had taken a shape of a dismaying condition.

Towards the end of the 20<sup>th</sup> century, the concept of sustainability and allied concepts in various fields, such as sustainable environment, sustainable development, sustainable food, etc. became well-debated notions. These debates had taken two forms one had argued about the developmental goals of man and on the other hand, many had discarded these views to be only an academic luxury and also seen as an ephemeral idea (McCabe, 2003).

Since 1987, after the publication of ‘the Brundtland Commission report’, the expansion of the global population, made the global scientific

community ponder upon the development and its concerns, hence thereby on “sustainability” as well. Henceforth, in 2002 the discussion of the World Summit of Sustainable Development focused on the concept of sustainability. The summit focused on the assessment of the progress and the loopholes of Agenda 21, a non-binding action plan on sustainable development (McCabe, 2003). Sustainability and sustainable development had been inherently part of the anthropological discourse since their beginning. The scientific connotations of the concepts and their earlier definitions based primarily on the Brundtland Commission’s report were struggling with some definitional issues on the other fronts while social, political, and economic dimensions were pushed to the back seat (Stone, 2003).

Anthropologists used various synonyms or terms close to sustainability such as viability, resilience (Brightman and Lewis, 2017), etc. Anthropological pursuits to understand sustainability might have taken many forms ensuring sustainability in its functional aptitude. The discipline which worked with humanity for ages found it a challenge to define sustainability in its concrete terms as an ideal adjustment of mankind to its surroundings. As humans would try to optimise their survival by changing their mode of adaptability to their changing environment which also encompassed not only environmental adjustments but also their changing economic, political, and social surroundings that continually shape and reshapes human survival in its proximity (Stone, 2003). Various indigenous societies have been engaged in behavioural adaptation to natural as well as social environments fulfilling individual or societal needs to improve quality of life in balance with the enduring nature and its resources.

Thus, it had become very significant to review the traditional definition of sustainability both at global and local levels and to understand it through detailed ethnographic examples, which is the forte of anthropologists. The debates were around what was sustainable could be modelled, and if a particular way of life could be identified that was sustainable taking into account diverse time, space, gender, class, ethnicity, and other variants in a globally integrated world of economic and environmental continuity and within which boundaries of such studies were to be

constructed (Stone, 2003).

Brightman and Lewis (2017) argued that to universalise, sustainability was coupled with development, which stands as a much-debated concept. Many authors supported the quest for an alternative to neoliberal understanding and definition of 'progress and development'. The development interventions had detoured socio-cultural realities resulting in unproductive efforts. Brightman and Lewis showed their disappointment as the desired results were lagging despite highly skilled systems being emplaced to achieve them. The challenge was posed by the structural percolation of strategies in a top-down approach rather as William Adams said (as cited in Brightman and Lewis, 2017), it could be achieved without the government's control by delivering the conservation instruments to the bottom, 'unleashing the energies from below. It was also pointed out that the indigenous people were now incorporated in the sustainable forest talks to resolve the issue of deforestation but the aim was only restricted to dialogue and understanding of the local perspective which is pushed to the periphery in practising the sustainability drive. The time limit and devaluing of local perspective and practice also contributed to the failure of the practice. The question largely arose with the fact that when all the other discourses in social and natural sciences were talking about sustainability and sustainable development, then what was the view of Anthropology in this context, that needed to be understood? The discipline of Anthropology was holistic and involved a meticulous understanding of a phenomenon in its spatial and temporal dimensions. Anthropologists have argued that the discipline could support harmonious interaction between scientific disciplines and understanding of local communities as all seek to comprehend the Anthropocene. They argued that Anthropology was in a better place to cater to the shift across cultures and disciplines by extending ideas, values, and practice at both small as well as large scales (Brightman & Lewis, 2017).

Anthropology sought to understand every link that connected humans to their non-human entities, thus seeking to study what all scope existed for mankind and its survival in present, also contemplating how to create a sustainable future (Brightman & Lewis, 2017). The notion of

sustainability largely focused on the upcoming generations in a way that they could sustain themselves in the time to come thereby seeking a need to create liveable earth. Anthropology focuses on studying humans in all their related dimensions whether it's society or the ecology in which it thrives or it can be the process through which humans had been evolving and adapting themselves to survive in their surroundings. So overall it can be said that Anthropology contributes to understanding how to sow the seeds of prosperity on this planet so that mankind can reap its benefits for its survival and not only for its own but also for all the upcoming generations to come, how modern man, since the genus *Homo* had evolved and had been able to adjust himself in consonance with the environment.

Implementing United Nations Sustainable Development Goals (SDGs) was quite challenging as some of them conflict with each other as illustrated by Homewood (2017) that eliminating poverty (SDG 1) was producing conditions antithesis to the requisites protecting terrestrial ecosystem (SDG 15) often creating an inherent contradiction between schemes and objectives of conservation and development compromised by the techniques employed to resolve the issue in a geo-politico-economic domain and humanistic engagement. Moore (2017) noted that it was not just technical problems in various concerned domains in SDGs but rather involve a major assignment of changing values. She argued that it might require visionary ideas concerning fundamental prerequisites of communities and societies as traditionally understood in Anthropology such as sociality, cultures, and sustainable actions.

Moore (2017) proposed a bone of contention that human was aware of the unsustainability that is inherent in modern industrial societies that fundamentally relied upon high consumerism but what was contradictory was the fact that despite such awareness that consumption was at its brim of what the earth could support. Therefore, merely addressing concrete issues such as climate change, water shortage, food security, etc; would not solve the crisis. So, what was required now would be the modification of values that called for a need of institutional and organizational changes, the need to pay heed to various notions and knowledge that were

primarily the societal norms and the ways of living amongst the simple and traditional societies such as sociality, trust, companionship as conventionally understood in Anthropology. Thus, it was concluded that the underlying issue of the idea of sustainability was not from its technical standpoint, rather it was a matter of "change" both fundamental and behavioural that induced new dimensions of ethical requirements in Anthropology. This could be elucidated by the simple fact that climate change had taken a serious toll on the south of the globe which has put several indigenous, vulnerable communities at stake. Here Anthropology could come in to better understand and acknowledge the nature and kind of injustices that were done to them and how in the north certain curtailment could be introduced in the usage of resources.

Escobar (as cited in Brightman and Lewis, 2017) also suggested taking into account best practices that we the so-called modern, developed, industrial society could learn from these indigenous societies who often get marginalized. And therefore, in this way, if we redevelop the idea of sustainability which was engrained and contextualized within the society and socio-cultural lives of the communities, we can amalgamate the traditional knowledge of humans and its need to reap the benefits of the environment (Hastrup, 2017). In the early 1900s, a group of theorists called the functionalists in Anthropology understood society by giving an organic analogy. Just as a living organism thrived, reproduced, and evolved through an interdependent organized functioning of its cells, tissues, and organs thus producing the entire system through which life could survive, similar to which society was able to sustain with the institutions such as religion, economy, polity, kinship as the organs that was driving the entire society.

These theorists were able to take out the essence of the function that these institutions play to make a society survive. As a school of thought in Anthropology, it emerged in the early twentieth century with scholars like Bronislaw Malinowski (1922) and A.R. Radcliffe-Brown (1952) having the greatest influence on its development. Malinowski recommended that each individual had some physiological needs such as food, shelter, and

reproduction and these institutions were there to satisfy such biological needs. Therefore, society and culture functioned to serve the individuals leading to a sustainable and holistic development of man in their natural habitat embedded with culturally significant values, charters, norms, and material apparatus that guides each of these institutions.

Radcliffe-Brown who was also called a structural-functionalists focused on the social structure than the biological needs. According to him, society was made up of systems of relationships provided by the institutions that helped in maintaining itself as a system and individuals were replaceable and mere transient occupants of social roles, but the society would continue to sustain itself. Thus, these theorists provided a holistic view of the culture and society and therefore no institution could be studied in isolation due to their interdependencies and interconnectedness. This could be correlated with the idea of sustainable development and thus an integrated approach is needed to solve global problems. We must seek an approach that advocates cooperation on social, scientific, economic, political, and environmental issues on an international platform. As sustainable addresses a complex set of problems such as resources, consumption, rationalization of production, energy, etc., it is needed to understand the community and its comprised members in its totality. Any policy related to such a development will be of success only if the citizens are observing them with participation and it goes in sync with their cultural attributes. Therefore, it becomes indispensable to study the society or the community in its meticulous details to develop a policy framework. It is required to get the consensus of all the participants to implement them. In this regard, anthropologists can contribute by giving detailed ethnographic accounts of the stakeholders which can further help the policymakers to find out how coherent and long-lasting balance can be attained in social, economic, and environmental attributes of man which is a humble way toward good governance.

In the 1930s and 1940s, a significant perspective and a theoretical standpoint emerged in the discipline of Anthropology, when an attempt was being made to understand how diverse cultures were similar and dissimilar in accordance to the environment and how

the cultures had been adapting to their surroundings since their inception. This approach was known to be as 'cultural ecology' which intended on elucidating the interaction of culture, man, and the environment. It explained how technological adaptations led man to go through basic survival that was subsistence and thus provided causal explanations.

During this current ongoing global era of Anthropocene, the Anthropology of the environment has played a significant role in the understanding of sustainability and also of such a development. Anthropocene is essentially such a period in geological time when the effect of interference of mankind has started to take a toll on the ecological balances, disturbing the biogeochemical cycles of nature that in turn began to have detrimental consequences to environmental order. Anthropology has contributed in this regard with insights as to what has created the crisis and how the culture has played its role in survival, what are the differences and similarities between the universal and the particular traits, and how the biological concept of ecology and natural sciences have a close interrelationship with the social sciences, opening a window to the scholars and scientists as to how environment and culture have been in an inevitable relationship. This kind of approach and study is not something that is a novel notion in the discourse of Anthropology, as it inherently studies man in its complete outlook.

Our ancestors, the hominins, were born in their surroundings, were brought up in the lap of the environment, evolved by continually adjusting themselves to nature, learned to walk upright, learned to cultivate, and learned to make tools, there had been a continual elimination and natural selection of our ancestors and other cohabiting fauna and flora throughout the episodes of the glacial and interglacial period. Finally, modern man was speciated along with phenomenal environmental changes, and today we continued to thrive following our needs but the fulfilment of which comes either from the environment or by its alteration. Thus, the environment had always been at the core of anthropological studies. The common perspective that the environment and ecology during the Anthropocene period are dominated by the Anthropos is highly becoming unsustainable and can be put into the floors of

sustainability by going beyond the humans, human actions, human policies, and decisions.

Anna Tsing (2017) said (as cited in Brightman & Lewis, 2017) "Meaningful sustainability requires multispecies resurgence, that is the remaking of liveable landscapes through the actions of many organisms". She questioned the overemphasis of scholars on human plans and actions. The disjointed others made 'sustainability' a parochial concept, as in the discourse of understanding the idea of sustainable development we tend to forgo the non-humans, thereby often not understanding that sustainability as an idea must take into consideration humans and non-humans to make the earth livable for the both.

#### UNDERSTANDING GENDER IN ANTHROPOLOGY

##### *Women's Participation in Sustainable Development*

Gender is a key concept in the discipline of anthropology. And gender equality is a very important aspect of sustainable development. Gender refers to the social dimension of being male or female in any given society. Throughout the twentieth century and the rise of sociocultural Anthropology, the meaning and significance of gender to the discipline have shifted. In early ethnographic studies, gender was often synonymous with kinship or family, and a monograph usually included just a single chapter on women or family issues. Gradually anthropologists became interested in analysing the causes of the lower status of women, different forms of inequality, and empowerment of women. In the field of development, gender issues gained global prominence with the feminist movement, more recently SDGs. Reducing gender inequality is a very important development goal today.

Feminist anthropological studies and their contributions to theory have given us a comprehensive understanding of women's position and roles in traditional and contemporary societies, the impact of changing economic and political environment, and gender inequality. Anthropological knowledge has also contributed to the development of approaches to address gender inequality. Some important studies are discussed below.

Early twentieth-century anthropologists presumed that the social and political differences or divisions between men and women were 'natural'. That male violence and aggression were biological, and conversely, women's innate maternal instincts led historically to matriarchal, female-dominated societies. The works by anthropologists like Phyllis Kaberry, who did fieldwork among Australian Aborigines in the 1930s, depicted women as 'active agents' but generally subordinate relative to men (Kaberry 2004).

Later studies challenged the notion that biological factors led to the subordination of women. There was a separation of the notion of sex from gender. Divisions between men and women were seen as being rooted more in culture. In the 1930s, Margaret Mead's study in Papua New Guinea demonstrated that ideals of femininity and masculinity, gender roles and responsibilities, vary enormously between groups, thus, were cultural variables. Her work clearly distinguished between sex and gender, the biological factors from the cultural factors that control human behaviour and personality development. Thus, it became clear that the definition of gender may vary from culture to culture (Mead, 2001).

With the rise of feminist Anthropology in the 1970s and 1980s, gender emerged as a distinct area of theoretical and methodological interest within the discipline. Feminist anthropologists sought to bring attention to divisions between the domestic and the public sphere, structural inequalities, the role of economic disparities, and politics and identity. An important contribution in this area was made by anthropologist Eleanor Leacock (1922-1987). She was particularly known for her studies of social and gender relations among the Montagnais-Naskapi (Innu) of Canada and her contributions to feminist theory. She adopted a Marxist approach in her ethnographies and argued that capitalism is the source of much female subordination. Her work emerged at a time when feminists were grappling with explanations for inequality and oppression, from discrimination on the job to domestic violence and rape. Leacock argued that women's oppression has its origins in economic developments and social relations and that pre-class societies lived free of inequality. With the rise of state societies and capitalism, women's roles got reduced

to family and their work was marginalized (Leacock, 1981).

Other important contributions in the area have been by Barbara Rogers, who in her work "*The Domestication of Women*" offered a critique of international development agencies and programs, where the field of development planning was dominated by Western men (Rogers, 1980). It also highlighted how capitalist exploitation, and Eurocentric ideas about the roles and activities proper for women, led to the destruction of women's traditional rights in society and undermined their economic autonomy. Concepts like the feminisation of subsistence agriculture and the feminisation of poverty also emerged from anthropological studies on African communities (Moore, 1988).

Insights from Anthropology have also shaped the approaches to address gender inequalities - from Women in Development to Gender and Development. Women in Development (WID) is an approach to development projects that emerged in the 1970s, calling for the treatment of women's issues in development projects. At that time, development projects were skewed towards men on the assumption they were "heads of households", thus their positive impact on women was limited. The WID approach looked at how to better integrate women into existing development initiatives to increase their productivity and earnings. Later in the 1980s, the Gender and Development approach proposed more emphasis on gender relations rather than seeing women's issues in isolation. It emphasized the need to challenge existing gender roles and relations. It concentrated more on project design and interventions that were focused on a development process that transforms gender relations. The aim was to enable women to participate on an equal basis with men in determining their common future.

Thus, we see how anthropological studies have enriched us with knowledge about gender issues in society and how inequality can be addressed. We know that gender inequality constitutes one of history's most persistent and widespread forms of injustice. Women and girls continue to suffer discrimination and violence in every part of the world. Gaps in gender equality exist in every sector, be it education, health, political participation, or

participation in the workforce. Equality is the necessary foundation for a peaceful and sustainable world. Equal access to education, decent work, ownership of property, and representation in political and economic decision-making processes are not only women's rights, but they would benefit humanity at large. This is only possible through the empowerment of women, recognition of women's rights, supporting gender-just laws, and effective implementation of laws.

Women across the globe are responsible for childcare, nutrition, and health of their children and play a crucial role in managing household affairs. In developing countries like India, women are significant contributors to agriculture and farming, the rearing of animals, and also the collection of their fodder, water, and household sustainable fuel sources such as cow dung cakes that could be seen wisely in rural agricultural India. They are the key stakeholders in safe water collection and sanitation management with healthy practices to keep their children and other members disease-free. But an unfortunate scenario is that in these countries policy-making and enactment take into account their voices and concerns the least. If we go back a few decades, the Rio Summit also women played a significant role to the extent that led the global stakeholders at Rio to consider women to be one of the key groups who are an indispensable part to achieve sustainable development goals.

For all the efforts that she puts in, women carry a disproportionately higher burden of unpaid work in terms of domestic chores and childcare. Women's contribution has been primarily surrounded by sustainable practices that contribute not only to their households but also to the national level. But this contribution is invisible in national databases, especially in national policies. This unequal distribution of unpaid work is rationally unjust and deprives women of equal opportunities. The government could recognise unpaid work in national surveys the data of which could be used in national policies. The work is often repetitive, boring, and frequently drudgery as it has neither any remuneration nor any retirement benefits and this restricts the opportunity a woman can have to contribute to the economy. It is now a demand on an urgent basis for macroeconomists to realize this economic potential

encompassing a more holistic, gender-neutral, and realistic economy.

The need of the hour is to recognise the women's role in sustainable development by enhancing their role and expanding their voices in any environmental decision-making to contribute to a green economy, such economy that balances economic growth with a reduction in carbon emissions, energy efficiency, and preventing loss of biodiversity and ecosystems. There should be an increase in women-centric capacity-building programs and training suited to their needs. To make women a part of inclusive sustainable development as a catalyst to the process, it is an immediate requirement the role of a woman to be free of any socio-cultural limitations that they have been facing since time immemorial in all spheres of their lives be it in their family, community or the society at large. Thus, the need is to change in perspectives and mindsets that have been preventing the participation of women on a global platform.

Provisional figures of the 2011 census (p.126) showed the male literacy rate to be 82.1% while for females it lags at 65.5%. Estimates show that for every 100 girls in rural India only a single one reaches class 12 and almost 40% of girls leave school even before reaching the fifth standard (World Bank Group, 2017, p. 6). The release of the Global Gender Gap Index, 2020 which is published by the World Economic Forum ranks India 112<sup>th</sup> out of 153 countries, and previously in 2018, it ranked 108<sup>th</sup> among 149 countries. The report also states that approximately around 99.5 years more would take to end the gender disparity (World Economic Forum, 2020, p. 6). According to this report, South Asia accounts for about 860 million women of whom two-thirds are residing only in India and the gender gap can also be seen in the literacy rate with female literates at 66% compared to 82% literates amongst the males in India (World Economic Forum, 2020, p. 24).

The recently released Global Gender Gap Report 2022 provides a furthermore grim situation, India ranked 135 out of 146 countries (World Economic Forum, 2022, p. 10). India is the fourth most lagging country in terms of the gender gap in South Asia with Iran, Pakistan and Afghanistan. The report considers several sub-indices. South Asia had the widest gender gap on the economic participation and opportunity

gap sub-index (p.22). They are one of the largest in India, ranking at 143 out of 146 countries with only a 32.6% gap closed so far (p. 13). Only 22.3% of women participate in India in the labour market which translates into a gender gap of 72% (p. 14).

The Constitution of India makes special provisions to ensure gender equality for women through Article 14, article 15 clause 3, article 39A, and Article 42. The legislature of our country has also enacted several laws and acts to uplift women's rights and voices such as the Dowry Prohibition Act, 1961; Minimum Wages Act 1948; Maternity Benefit Act, 1961 etc. Several programs have been launched to intend towards the development of women and empowerment such as Beti Bachao Beti Padhao to ensure education to the girl child, Mahila Shakti Kendra to empower rural women with skill development and employment, Rashtriya Mahila Kosh which provides micro-credit to poor women, Ujjwala Yojana to provide better health by distributing free LPG, Sukanya Samridhi Yojana – a government-backed savings scheme for girls that can be utilized for higher education and many others. Though these programs have been able to create major differences, more is yet to be done especially in the field of education and literacy.

To illustrate we may take the case of Sukanya Samridhi Yojana, in which Bhattacharya and Gandhi (2020) have found through some studies that there is regional disparity in the scheme's populace and acceptance, where the acceptance is found more in the northern states. These kinds of studies should further be done to take out the loopholes in the implementation and the efficacy of such schemes to make them more goal-oriented and better targeted. The Global Gender Gap 2021 places India at 114<sup>th</sup> position out of 156 countries in its subindex of education attainment gap which is one of the lowest in South Asia (World Economic Forum, 2021, p. 18) concerns us about the need to emphasize diluting the gap thereby encouraging more women to take up education, and also stepping into taking up higher studies in research in science and also in other fields.

#### *Women in Science-Why They are Behind?*

Historically in India, women had played a crucial role in the development of science and technology.

The British era produced phenomenal women excelling in their respective fields. Here I must mention a few names such as Kadambini Ganguly who was the first female physician in India, physicist Anna Mani, Rajeswari Chatterjee, the first Indian woman to pioneer in the field of microwave engineering, Anandi Joshi who was trained in Western medicine and first female to have graduated in western Medicine for the United States and countless such names.

In the post-independent period, exemplary examples can be cited to portray women's excellence in science and technology. Some of them are worth citing here. Indira Hinduja pioneered the GIFT technology (gamete intrafallopian transfer) that resulted in the birth of the first GIFT baby, space astronaut Kalpana Chawla, the first Indian woman to space, Janaki Ammal who was the first Indian scientist to be the recipient of the Padma Shri award, oceanographer Dr Aditi Pant who was the first Indian woman to visit Antarctica, Tessi Thomas also known as the missile woman of India, the first woman scientist to head a missile project in India, Chandrayan 2 mission director Ritu Karidhal, etc. and the list goes on to enumerate the excellence of Indian women in science and technology. Therefore, there cannot be any apprehension in saying the enormous contribution that women made in the field of science and technology especially quoting India.

In a recent reply by our honourable Union Minister of Education Sri Dharmendra Pradhan to a Lok Sabha question, it was found that in comparison to even the developed countries such as the United States and the United Kingdom, Indian female graduates in STEM (science, technology, engineering, and mathematics) holds a greater percentage which is nearly around 43% as per the data on gender statistics released by World Bank and quoting the AISHE data from the last three years he stated that there has been a rise of 53,388 women who have opted for STEM as a field of study from 10,02,707 in 2017-18 to 10,56,095 in 2019-2020 whereas there is a decline of men enrolled for studies in STEM from 12,48,062 in 2017-18 to 11,88,900 in 2019-2020 which includes all the enrolment in the graduate, postgraduate and PhD level programs. This provides a cheerful picture but this is just the beginning towards more inclusive education and better implementation of government programs that

encourages women to pursue a career in science and technology also, we must now emphasize finding out the underlying qualitative factors that have been deterring women from taking up science and technology.

It is pertinent to note that according to the female gender percentage in India by World Bank based on data retrieved by them from United Nation's World Population Prospects:2019 revision, females constitute about 48% of the population which is very little less than half of the total population but on the contrary, they contribute a little above 20 per cent in the labor force (comparing up to 2019) as per data retrieved by World Bank from International Labour Organization. The UNESCO Institute for Statistics June 2018 provided a fact sheet called *Women in Science* that women only make up around 14 % of the nearly 28 lakh scientists whereas the global average translates to around 28.8%. In the global scenario, according to UNESCO's forthcoming *Science Report*, only 33 per cent of researchers are women, even though they represent 45 and 55 per cent of students at the Bachelor's and Master's levels of study respectively and 44 per cent of those enrolled in Ph.D. programs". Thus, it is quite evident that although women are now excelling in taking up higher studies in science and technology but not equally been translated into employment in this field.

Having said this about the great contributions of women in science and half of the population it is crucial that we must not now overlook such a vast expanse of the population and must now indulge them and make them recognised in the field of science and technology to harness their intellectual capabilities in this field. It is also important to find out the gendered perspective and gender analysis in all these fields to discover new things and dimensions. The more diversity, the more it adds to collective intelligence in the group of scholars.

Science and technology cater to all sections of society and also to all gender across humanity whether a man or woman or even the third gender as recently recognized and therefore the outcome have a lot to do with who is doing the scientific inquiry. We need to design a therapeutic chair, would that only be used by men? No, but we must take subjects across the various gender so that we can innovate something

suitable for people across various somatotypes. The gendered approach is therefore very crucial in science whether they are subjects of study or they are researchers. Therefore, today it is necessary to incorporate not only women but all the third gender as scientists and researchers.

Science is the front seat in nature which solves mankind's problems arising out of existential crises and technology serves to fulfil the needs man faces in his everyday life. And we all know that need is the mother of invention and discovery. What may be the need of a woman can be well understood by a woman herself which can make her innovate and create ideas to serve that need which might not be done necessarily by men because it is possible that what the other gender perceives to be of great importance might not cater the same need to the man.

We need to encourage more women in this field and support them essentially. There is no innate biological or physical lag for a woman to understand and research science and technology, it is just some physical barriers that have led this field to be dominated by men today. In most developing nations even today, women lack even access to basic education and later on acceptance in the workplace. It is now the time to bridge the gap.

Press Information Bureau, Government of India (2021) stated "As per latest Research and Development Statistics, 2019-20 of DST, India has 16.6% women researchers directly engaged in R&D activities. There are several reasons for the lower participation of women in R&D. This includes familial issues like marriage, family responsibility, relocation due to transferable job of the spouse, etc. These reasons attribute to dropout from higher studies, career breaks, overage for scientific jobs, and prolonged absence from place of work or even resignation from the job"

Right beginning from school days, another gender than men, should be encouraged to accept science and technology to pursue higher studies by combating stereotypes of their gender and intellect, teaching a growth mindset from the early school days, exposing young talent to the greatest women achievers in history as their role models, provide them with the opportunities to succeed in this field, and by creating such an environment that promotes science as early as in the lower grades of school.

We have learned before about the contributions of women since the prehistorical ages towards sustainable and holistic development. The greatest challenge to achieving sustainable development goals tackling issues such as climate change to reduce poverty and improve health would need to harness a woman's or even the other gender's potential. In this direction, the Government of India has taken several steps to encourage women scientists in research activities.

The SERB-POWER initiative, has aim to reduce gender inequality in the field of science and engineering through fellowships and research grants. Knowledge Involvement in Research Advancement through Nurturing (KIRAN) Scheme is started by the Department of Science and Technology (DST) and aimed to bring gender parity in the Science & Technology sector by inducting more women talent into the research & development domain. Vigyan Jyoti Scheme is launched by the Department of Science & Technology (DST). It is intended to create a level-playing field for the meritorious girls in high school to pursue Science, Technology, Engineering, and Mathematics (STEM) in their higher education. The CURIE program of DST where only women Universities are being supported for the development of research infrastructure and state of art laboratories to promote women's participation in science and technology. Several and numerous such programs have been initiated which now need to be revisited and implemented with a greater effect.

#### ANTHROPOLOGY, HUMANITY AND SUSTAINABLE DEVELOPMENT

Laura Rival (2017) argued that achieving the real meaning of sustainable development goals and putting them into a successful practice required delimiting the notion that incorporates every stakeholder i.e. every living being of the planet, going beyond only governments, corporations, and the scientific communities.

Homewood (2017) gave a well-documented case study in the East African rangelands to understand what the idea of sustainability is accounted for, by the local natives and whether it is in sync with the hegemonic notions of sustainability as broad as defined in the sustainable developmental goals. She

explicated the discourse of sustainable development, shaped predominantly by three key aspects: economic development, social equity, and environmental protection. She argued that the convergence of these three together as the global visions try to consider, is virtually impossible. These aspects are assembled through various focus areas around which goals are formulated and measurable and verifiable indicators are considered measures to collect and analyze data.

She focused on how civil society institutions see the trade-offs between rural livelihoods, biodiversity conservation, and expanding large-scale cultivation at the local level through Community-Based Natural Resources Management: CBNRM. She studied these key aspects in the context of East African rangelands which were home to renowned pastoral groups such as Maasai, Samburu, Turkana, and Mursi, and later in special reference to Tanzania's program of Wildlife Management Areas (WMAs).

In the study she focused that the East African rangelands had three aspects that played an integrated role in the conservation and development pursuits - the first was the rangelands, which were the home to a diverse declining wildlife population, the second was the indigenous pastoral people who were engaged in a well-debated land use practice and economic activities with low efficiency and productivity, and socio-political marginalization contributing to the perceived poverty. The third factor knitted the value of the tourism business, which could be escalated if the locals go away from the habituated land, leaving scope for a vast expansion of wildlife to attract tourists, the top contributor to the GDP in countries of East Africa (Kenya and Tanzania). This was the kind of environmentally sustainable conservation practice(s) through which economic growth, social equity, and environmental protection all can triumph, which forms the base of the majority of conservation and developmental programs across the world. But the vision of CBRNM was to keep the locals at the forefront, making them the responsible stakeholders.

The state and international NGOs were working in collaboration where the state was designing and driving the program well adapted to the local situation, and the NGOs funding their intervention, which was focused on community participation in the

management of wildlife resources, to enable them to derive benefits from wildlife resources where revenue was distributed to participating villages and enhance conservation of wildlife resources. Participation was a complex and compromised concept. According to Comandulli (2015), as cited by Homewood (2017), when the role of participation was given prominence in the developmental goals and conservation policies to balance out social equity and justice, the power relations have been often seen to get into scores of uncertainties.

The team working in this area did participatory mapping to formalize WMA boundaries following participatory land-use planning (PLUP) protocol based on the manual given in FAO (2009). The village government (VG) members (of the village targeted for incorporation into a WMA) were asked to identify seven village representatives who were given brief training after the creation of a map before the planning process locating the existing land usage practices and other key resources. It was followed by the creation of a map locating land usage from a futuristic point of view.

The participation of local people, restricted to a level was reported to be weakening the participation and was taken as against the community. Homewood (2017) argued that another dimension that needs to be incorporated into 'meaningful participation is that the local people must be able to become an evaluator of the kind of interventions instilled which can further be used to revisit, modify or eliminate any measure. The benefits going to the village are meagre as the chunk gets diverted to the state taking away 1/3<sup>rd</sup> of the benefits and the rest is divided into 50 -50 proportions between WMA and VG (used for community-level projects such as building school classrooms, paying a fee of the selected student, etc.) which hardly percolates to the household level. To become eligible to receive these the WMA villages have given 90% of their productive land and which also turned into a story of disappointment among people because of rules imposed on forest collection, additional costs of living in proximity to wildlife, such as risks of disease, loss of property and lives of human as well as livestock. The cases reported unfolding the difficulties in human and wildlife conflict (Brightman & Lewis, 2017).

The Northern proposal of WMA was rejected initially but eventually, village members were persuaded to join and local people were evicted from their lands for the project thus making them compelled to live in the unoccupied and abandoned area in and around village lands where they were not even allowed to access it for grazing. Thus, what we can visualize here is that the connotations were largely politico-economic in characteristics rather than imbibing the aspects of the environment and its sustainability.

"People commonly expressed local visions of modestly aspirational futures centred on the security of tenure, of food and livelihoods. These were generally phrased in terms of social, political, and economic rather than environmental characteristics. This focus on dimensions of security was not some manifestation of a conservative culture resisting change (Homewood, 2017). Anthropology's view of sustainability foregrounds local voices and buy-in; demands a cultural and political analysis; and challenges the hegemonic discourse globally and locally. It argued for a far stronger awareness of the political and political-ecological dimensions of sustainable development interventions, with special reference to local land-use situations, and more attention to large-scale processes of resource grab, conversion, and extraction. Anthropology was now well placed to integrate qualitative and quantitative analysis, evidence and critique in ways that carry weight with policymakers, and to shape positive change".

Another case of people and sustainability could be illustrated in the following work. Lalita Prasad Vidyarthi, one of the renowned anthropologists from India, opined that there existed a complex interaction of ecology, man, and religious aspects that contributed to habitat conservation. In 1963 he published his work on the Malers of Rajmahal Hill of the present Sahebganj district, Bihar which elucidated how the ecology shaped every aspect of this tribe. He interpreted that the life of Maler was deeply connected to the phenomenon described by him as the 'nature-man-spirit complex'. This book took out methodological and theoretical standpoints to understand the inevitable character of the relationship between man and the environment through religious aspects, and these elements are interdependent and

mutually complementary. And such a close association with ecology was due to the fact as Vidyarthi found that the Maler culture originated and flourished in nature's cradle so much so that the forest was an indispensable part of their life be it providing land for slash-and-burn agriculture or providing them with day-to-day resources and therefore the main source of Maler economy. And the religion which was surrounded by several spirits was a way to mediate their interactions with nature.

What has been a contention for several anthropologists is that the primary definitions and scopes of sustainable development have majorly been from a global perspective. As we had come across phrases like "global environmental change" or "global water crisis" or the ideas of chronic poverty, hunger, etc which more or less address the problem in its totality across the globe wherein, though the conventional concepts of sustainable development, it does not limit itself to local scenarios and goes beyond trans boundaries. Anthropological models of sustainability cannot "neglect and place boundaries on the local systems and overlook and overlook important aspects of border systems" (Stone, 2003). Contemporary scholarships have given rise to a new field called "sustainability science" (Kates *et al.*, 2001; *cf.* McCabe, 2003) that had a quest to understand how nature and society could be related somehow which had gained commendable attention in the global scenario (as cited in McCabe, 2003).

Therefore, it is now crucial for anthropologists to come to the forefront and to engage themselves in deliberations that were taking place on global platforms such as the United Nations or in the above-mentioned new field of sustainability science. She also expressed disappointment because there were many authors such as Robert Netting (McCabe, 2003) who had devoted their lives to studying sustainable cultural practices but were rarely found in the literature concerning sustainability science. She also stated that since Anthropology historically continued to be associated to study people and their surroundings, the discipline needed to take part in the discourses and debates regarding sustainability as well as sustainable development, and hence this discipline could contribute toward significant perspectives surrounding the entire notion of what was being

sustainable and how to put the traditional theories concerning it into action in times to come.

## CONCLUSION

In this presentation, I have tried to correlate the concepts of Anthropology and sustainable development linking them with gender issues. Anthropology can contribute immensely to understanding the indigenous ideas of sustainable development which can help global scientific scholars and academicians to achieve Sustainable Development Goals better. It can overall be able to diversify the connotations and definitions of sustainability in a more holistic frame and thereby can provide new meaning and dimensions to the already existing notions of sustainability and sustainable development. Anthropologists through detailed ethnographies would further be able to let the world know about how communities even now are using nature-friendly sustainable technologies in their day-to-day life, which the members of so-called modern society with unending needs and demands, can learn and practice.

Anthropology started with its engagement with preliterate and premodern, non-industrial societies. In India when it comes to contributing to the core scientific debates such as issues of sustainability and sustainable development, anthropologists have taken a back seat. Through this paper, I argue that a subject that every day deals with mankind holistically, be it molecular genetics or learning about socio-economic domains, has been kept aloof in significant debates and discussions. It is high time that they get recognition in the national and international platforms that deal with the problems of humanity.

Women are an inevitable part of society, science and sustainability, without them being equally a part of the scientific community it is almost impossible to attain an era of advanced technology contributing to sustainable development. Anthropology can help more in understanding society and cultures of people across the planet and tackle the issue of why have women taken a backseat in the majority of the countries whether developed or developing, in higher studies and research in the field of science and technology. It is now very significant that we take a bottom-up approach, understanding the perspectives on gender

across different castes, classes, religions, ethnicity and regional affiliation. In a country like India where society has been patriarchal, there are many obstacles for them even to pursue a college education. It is pertinent to analyse these issues on a regional basis, then only much more effective implementation could be done of those schemes and policies that encourage women toward science and technology. Here Anthropology can play the most crucial and indispensable role to understand the gendered perspective.

I wish all of you a very stimulating session on the theme of the Science Congress during your stay here in Nagpur. Anthropology is the comparative study of other cultures. A cross-cultural understanding of the local cosmologies dealing with the ideas and associated practices around the issue of sustainability, sustainable development and women's empowerment hold clues to a better world with a sustainable planet. Let anthropology be a powerful intellectual voice in the era of the Anthropocene and beyond.

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