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Indigenous Knowledge System and Sustainability

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ABSTRACT: The contemporary times witness ecological crisis and concerns at the expense of incoming growth and developmental programmes that has reached even the remote corner of the world at large. Despite the significant improvement in development indicators in terms of health status, education, reduction in poverty, technology, etc, the world is threatened with ecological debt with increased pressure on natural resources globally to meet the demands of the development forces and agents (Aggarwal, 2008). The question of sustainability haunts developing countries of the world like India which faces constant negotiation and struggle in confronting the growing complexities of the world by way of rampant exploitation of the rich natural resources it offers. In this light, it is pertinent to acknowledge the role of Indigenous Knowledge of the local communities which has been the base of sustaining the fragile ecosystem without much recognition and appreciation given the fact that it is not rooted in formal institution.

KEYWORDS- indigenous, sustainable, knowledge, ecosystem, development

I. INTRODUCTION

India is a home to people belonging to different ethnic group, racial stock, cultural background, religious intuition, social structure, etc each having their own unique indigenous knowledge system which is believed to have passed down through several generations to make sustainable use of the given environment keeping in mind the future implication. This is especially true for those sections of population who live in close proximity with the ecosystem namely tribal societies, indigenous communities, marginalized group, rural poor and women, etc in which forest and natural resources forms an integral part of their existence and cosmology. The application of Indigenous Knowledge is rich and diverse such as water management, agricultural productivity, land use pattern, Ethno medicine, Animal Husbandry, food preparation/ preservation, seed storage, environmental conservation, weather prediction, human health, crop health, food security, and so on. Existing researches in this area have confirmed the significance of Indigenous Knowledge in environment sustainability while stressing the urgency to adopt, re-define and integrate these knowledge systems into mainstream policy and programme to enhance greater, if not complete Sustainable Development of the world at large.

Indigenous Knowledge maybe defined as ‘the knowledge developed by local people of a given environment that has been passed down over generations through oral tradition, kinship network, communal connection, social groups, etc. for judicious management of the resources on which their daily sustenance is dependent upon. However, there is no concrete definition of Indigenous Knowledge as such it has been defined and re-defined by many scholars, platforms, organizations and so on. The World Bank (2003) has defined Indigenous Knowledge as ‘the large body of knowledge, skills and experiences that has been developed outside the formal educational system which people apply to maintain, improve and sustain their livelihood’ While scholars like (Grenier in Mahalik & Mahapatra, 2010) has defined IK as ‘the traditional knowledge of the local community existing within and developed around the specific conditions of men and women indigenous to a particular geographical area’, whereas (Basu also in Mahalik & Mahapatra, 2010) opined that ‘ Indigenous Knowledge is found in peoples’ memories and activities which are expressed in the form of stories, songs, belief system, rituals, folklores, community laws, local language, cultural values, agricultural practices, material objects, plant species, and animal breeds’ while Sharma (2014) adds that ‘Indigenous Knowledge also referred to as traditional or local knowledge is embedded in culture and unique to a given location or society with special reference to the rural poor whose life is build upon it (IK) for decision-making of communities in food security, human health, animal life, education, and natural resource management’[1,2,3].

Indigenous knowledge is often termed as traditional knowledge, local knowledge, community or rural knowledge, farmers’ knowledge, tribal knowledge and so on, however, it is pertinent to understand that although the concept of Indigenous Knowledge has different forms, the meaning may appear synonymous and moreover, it is not limited or confined to tribal population or any particular groups as such.

In the face of growing inequities of the environment, ecology and the world at large, it is realised that Indigenous Knowledge system constitutes an important driving force for Sustainable Development-‘development that meets the needs of the present without compromising the ability of the future generations to meet their needs’ (Brundtland Report/ WCED Report, 1987, p 41). It is noteworthy that the world and the indigenous communities in it have a rich accumulation of knowledge based on their cultures, environments, social, political, and economic institutions, natural resources, etc which may be according to (Boon & Hens, 2007) the ‘key drivers’ for poverty reduction, livelihood improvement, and attaining sustainability of the given environment. Since time immemorial the indigenous communities across the globe have co-existed with their own set of knowledge and cosmology about the environment they live- in without much appreciation and recognition in the mainstream due to the fact that indigenous knowledge has its roots outside the formal institutions. It was only through United Nations Conference on Environment and Education in 1992, World Conservation Strategy of International Union and Conservations of Natural Resources in 1980, Brundtland Commission, and World Commission on Environment and Development, 1987, the concept of Indigenous Knowledge gained its worldwide recognition and its efficacy was realised (Mahalik & Mahapatra, 2010). These events brought forth the importance of Indigenous Knowledge in Environment sustainability and confirmed its existence in every country, community, and the society at large in contrary to existing misconception that such knowledge system is confined only to tribal groups or the marginalized sections of the world. The urgency of Indigenous Knowledge of the local communities was lately realized in the face of growth and development which has contributed partly to the increasing environmental problems and ecological crisis of the world at large.

Many researches done in this area have stressed that the Indigenous Knowledge provides useful framework, ideas, guiding principles, practices, and measures that can serve as foundation for effective development process for restoring social, economic, and environmental resilience of the world at large. Boons & Hens (2007) stressed that Indigenous Knowledge systems encompass years of analytical and experimental approaches to Sustainable Development and aids in re-shaping developmental methods in sectors like politics and governance, agriculture, health, natural resource management, commerce and industry, etc. Aggarwal (2008) confirms that indigenous knowledge are resource efficient and effective and they have been able to conserve and manage the resources much better than externally imposed, technocratic and resource intensive management systems which the global world offers today.

It is well established that India has a strong and vibrant cultural diversity and each cultural group or community have developed their own knowledge systems over the years which was originally passed down through oral traditions. A home to about 744 approx (Census 2011) tribal communities, ethnic groups, and diverse cultural background, India acts a storehouse of Indigenous Knowledge thereby depicting a rich yet curious intermixing of knowledge systems. According to the existing literature and research findings, it has estimated that about 70% of the Indian population is rural based in which natural resources plays a crucial role in meeting daily needs of the rural poor. The close dependency of the people on their immediate environment for their survival and livelihood enables them to develop knowledge about the given resources through daily sojourn, experiences, and utilization of the given resources. This is especially true for ethnic minorities, tribal communities, rural populations, women and other disadvantaged groups in India who live close to nature and are dependent on forest and natural resources available for their livelihood. It is noteworthy that this close dependency establishes a kind of sympathetic relationship between the local communities and the given environment, which is visible in their harmonic co-existence and sustainable approach towards resource management. Research conducted by Parajuli & Das (2013) confirms the significant role of indigenous knowledge in environment sustainability where-in the indigenous communities across the globe are conserving biodiversity in-order to sustain themselves which eventually conserves the whole environment. However, when it comes to policy making and developmental planning of the natural resources, the most important voices are often left unheard- the voice of the local communities who are the bearers of extensive ecological knowledge of the ecosystem (Kumar, 2001).

Indigenous knowledge is rich and extensive with special references to indigenous communities of India where-in the given environment and the natural resources are viewed not only as a means of sustenance/livelihood but they construct their worldview and cosmology around it. As such one may come across the concept of sacred groove, sacred sites, sacred forests or trees; etc which not only conforms to their religious faith and practices but also promotes sustainable development by way of conserving the ‘sacred’ resources. In addition, the indigenous knowledge are observed in day to day life ranging from agricultural activities, food security, land use, water management, forest products, crop cultivation, waste management, food preservation, and so on. Today, the indigenous knowledge of the local communities stands vulnerable not only to the elements of globalization, developmental programmes, environmental threats but also to the increasing concept of private property, issues concerned with land and forest rights, power conflict in natural resource management, gender disparity, impact of modernization in traditional belief system, and non-transfer of knowledge to the younger generations, etc. In this background, the following section shall throw light on some practical application of Indigenous Knowledge and its contribution to environment sustainability with special

reference to tribal communities and other ethnic groups of India while bringing forth those structural elements and issues that is leading to erosion of Indigenous Knowledge of the local communities at large.

Application of Indigenous Knowledge in Indian Context

With a major bulk of population belonging to agricultural sector in India, it is no doubt that much of the country's land is occupied by small scale farmers, subsistence cultivators, herbalists, hunters, gatherers, etc who depend on forests and numerous forest products available in the given environment relying on their locally relevant knowledge systems. According to 2011 census, it has been stressed that almost half of the total employment in the country's economy is generated in agricultural sector providing sustenance and livelihood to more than 70% of the people living in the rural location. This confirms that forest and the natural resources available in it is not only a source of food, fuel, fodder, medicine, meat, and so on but it is a home to millions of rural poor upon which their daily narratives and cosmology is constructed. Indigenous knowledge is multifaceted and so one may come across wide array of knowledge system in agriculture, forest cover, medicine, human health, plant and animal life, land pattern, water conservation, food security, and so on.[4,5,6]

A recent study conducted by Mishra, Singh & Kumar (2011) in Bihar among marginal and small scale farmers brings out a vivid picture of indigenous knowledge in Crop management practices (e.g. mixed cropping of turmeric, potato and chillies to increase the production of all three), Grain storage practices (e.g. Neem leaves are used in storing grains to protect it from insect and pests), Crop watch practices (e.g.- elevated platform or 'mahan' is constructed using wooden poles, local grasses, paddy straw, and crop residue to protect the crops from wild animals and birds), Prediction of weather/ climatic conditions (local farmers predicts heavy rain that when ants move to a safer place with eggs in their mouth), Soil health and fertility management (farmers utilize farm based manure and green manure instead of chemical fertilizer to enhance soil fertility and food quality), plants and animals disease/ health (farmers believes that a application of paste of Bael reduces shoulder pain of working ox, while mixed dose of turmeric, ginger, and garlic keeps Foot and Mouth diseases away), Human health practices (e.g. common practice of planting trees of Piplal and Tulsi in and around residential area produces oxygen/O₂ which is considered beneficial for all living organism, or application of a luke warm paste of turmeric, onion, dub grass, mustard oil for pain relief of any kind of external injury) etc. Although the local farmers have been applying simple measures and organic knowledge for conserving and maintaining sustainability of the environment, yet it is stressed that such age old existing have been ignored or sidelined to accommodate incoming modern technology especially in agricultural system of the state.

The tribal communities in North-east India extensively practiced shifting cultivation also called slash and burn since time immemorial and it is found that these communities have developed their own knowledge system in their close existence with the given environment. The work of Ramakrishnan (2000) explores the use of Nepalese alder (*Alnus nepalensis*) and many species of bamboo in shifting cultivation as a part of traditional agro eco-system management in the mountainous region of North-east, India in which the former fixes nitrogen while the later conserves potassium and phosphorus for better soil fertility and food production.

A significant study by Tiwari et al (2010) in Meghalaya, North-east India confirms the ecological knowledge of tribal communities in environment sustainability which is inherently developed in their harmonious existence with the given environment by way of constructing their worldview and cosmology around it. The concept of 'sacred groves, village restricted forests, village supply forests, clan forests and other traditionally managed forests' which comprises about 90% of Meghalaya total forest area enables the tribal communities to nurture and conserve forest/ trees in the vicinity of their habitations, near water sources, steep slopes, and other ecologically sensitive regions (Tiwari et al, 2010). These forest cover is a home to rich aquatic as well as terrestrial biodiversity and adheres to diverse species of medicinal plants and animals, wild food, herbs, and many other economically important resources. Such traditional conservation of forest and forest cover not only helps in conserving biodiversity and natural resources but also act as a 'safety net' and 'resource ground' for the communities as such the sacred forest is, according to local belief, the home of a deity who protects the village from natural calamities, famine and diseases while providing vital requirements in a daily life such as fuel, food, construction materials, water, medicinal herbs, edible plants, etc (Ibid, 2010).

Similar study conducted by Madegowda (2009) among the Soligas tribes of Chamarajanagar district, Karnataka brings out a rich traditional knowledge of their ecology, forest conservation, agricultural system, land use pattern, and other resource management, etc upon which an intricate web of their social, cultural and economic life is constructed. The study suggest that about 62 colonies of Soligas are located within and on the periphery of Biligiri Rangaswamy Temple (BRT) wildlife sanctuary and as a result they have had a continuous and intimate connection with the forest deriving most of their basic requirements such as food, fodder, fuel, fruit, medicine, herbs, and so on. The Soligas practised controlled ground fire which they believe is good for the control of invasive species, regeneration of

local indigenous species, dormancy of seeds, control pests and diseases and also regenerates food for wildlife. They also practiced shifting cultivation in which they cultivate the land for a era or two till the soil loses its fertility and then they move on to another patch of land. As they move on, they provide food such as banana, tapioca, cucumber, bottle gourd, pumkin, tubers, mustard etc which they left behind to wild animals in an attempt to conserve and balance biodiversity. It is further stressed this tribal had good water management practices and so whenever they clear land for shifting cultivation, they dug two or three pits/well alongside the field for consumption and irrigation while also serving as a waterholes for wild life. In addition, the Soligas possess rich folklores, and folktales through which they reflect indigenous knowledge of fauna, flora, dense forest, waterfalls, flowers, valley, etc while enabling them to transfer this knowledge from one generation to the next, and this helps to conserve and keep alive the knowledge of the community.[7,8,9]

An ecologically sustainable practice of land and forest cover among the tribal communities of Tripura, North-east India through shifting cultivation and concept of ‘sacred grove’ is vividly described in the works of Gupta (2000). In Tripura, shifting cultivation is deeply integrated into the social, cultural, and economic life styles of many tribal groups which constitute about 31% of the total population of the state. In traditional shifting cultivation or ‘jhooming’, the period of fallow land was about 20 to 25 years long and was sustainable and cultivation of mixed crops such as cereals, seasonal vegetables, fibre, and tree crops was practiced which provides permanent rich soil cover in addition to variety food crops and other products. In addition, a few virgin forest or patches of land or forest cover were set aside as ‘sacred groves’ to keep check on land use. The local farmers also adopts various soil conservation measures which enhances soil fertility while helping in regeneration of fallow land through germination of seeds from the unfelled trees on the cultivated plots and those in the scared groves (Ibid, 2000). However, this traditional jhooming practice is no longer a feature of tribal society in Tripura due to increasing population pressures, immigrants, food demand, etc which adversely decreased the fallow land, soil quality, traditional approaches to water channel, land and so leading to the present day agricultural system called ‘non- traditional jhooming’ characterised by short fallow period which is unsustainable. In this light, it is suggested that the solution may lie in improving existing non-traditional jhooming or replacing it with other viable economic and ecological options or by integrating traditional knowledge in policy and planning.

Similarly, the same fate of traditional agriculture is witnessed by the local villagers in Ladakh, which fall under western Himalayas in the state of Jammu & Kashmir, India. The traditional agricultural system of the Ladakhis is characterized by careful system of crop rotation, organic waste management, recycling of nutrients through the use of livestock for ploughing and threshing, and non-utilization of chemical fertilizers etc which enhances high quality yield (Angeles & Tarbotton, 2001). But it is found that this traditional agricultural system is in the process of erosion with the introduction of chemical fertilizers and High Yielding Varieties (HYV) by the Indian Government thereby declining the soil fertility and structure. This has not only threatened the traditional ecological knowledge of the people but has also brought about structural changes in their socio-cultural system at large.

Whereas in Central part of India, an indigenous institution of Van Suraksha Samiti (VSS) which literally means ‘Forest Protection Committee’ of a Suali village in Udaipur district of Rajasthan, do their bit of conserving forest and natural resources with the help of religious institution (Aggarwal, 2008). This institution is headed by Mokhi, a traditional head of the village who supervises overall management of the forest according to the rules of the institutions for the protection and harvesting of timber and other forest products. It is said that in the recent years due to problems of rapid degradation and forest depletion, the VSS closed down the forest for about 7 years with the help of religious rituals of ‘Kesar Chidkav’ or ‘saffron sprinkling’ in which the members of VSS brought sacred saffron from the temple of Kesariya ji and sprinkled the same on the forest along with some other rituals after which it was declared closed (Ibid, 2008). It was believed that anyone who trespasses this rule will not only face the wrath of the god but also be socially ostracized by Mokhi thereby degrading forest and resources was successfully controlled and managed through incorporation of ecological concern and religious belief system.

The famous ‘Chipko movement’ further reminds us of the ecological movement initiated by the local people especially poor women in response to rampant exploitation of the environment and resources upon which their livelihood is intrinsically linked. The exploitation of forest resources by rich and influential contractors threatened social, economic and cultural life of the hill people which lead them to protest commercial felling of trees keeping in mind the future implication of the fragile ecosystem leading to the world famous Chipko movement (Bandyopadhya, 1992). The influence of Chipko movement according to Kumar (2006) lead many to a realization that the participation of the local people or community participation against commercial forestry with special reference to rural women not only protected the ecology and the environment but also developed world’s consciousness on environmental change and issues.[10,11,12]

The recent initiative of rural women in Uttarakhand, India reaffirms active participation of women in environmental movement against the backdrop of increasing global climate change. Here, women play a key role in reviving and conserving civil forests in the face of several obstacles as such the women member in the panchayat takes initiative measures to encourage planting of broad leaf trees to increase oxygen level in the environment (Bishnoi, 2014).

The increasing role of women in the environmental front is further justified by the women in the rural village of Jharkhand by promoting sustainable community farming in the face of exploitative money lenders, land grabbers, and land degradation (Sinha, 2014). In small tribal village of Paharpur in Jharkhand, the only educated woman in the village to have completed her school education was upset at seeing people of her community quit farming due to heavy loss, dry land, land grabbing, and migration, etc. Determined to stop the trend of migration, she associated herself with self help group and impart lesson to other women in the village on community farming. Through their collective efforts they were able to turn dry and rocky land into cultivable land which as a result decreased the rate of migration of the villagers who now enjoy a proportionate increase in their collective prosperity. Today the village is financially secure, food security ensured, and children are able to go to school which was previously not possible due to seasonal migration.

Studies have also shown that human have co-existed with wildlife for long and so wildlife conservation approach cannot succeed without concerted efforts and involvement of local communities living in and around the forest area. In support of this, a latest lion census conducted in Gujarat reports that there is 27 % rise in the feline's numbers which now stands at 523 compared to 411 in 2010 (The Hindu Times, 2015). The forest officials acknowledges that such positive scale would not have achieved without the support from the Madharis, a nomadic tribe of cattle-rearers and farmers living in the vicinity of Gir National Park. It is said that the lions helps in controlling the population of nilgai and wild boars which frequently destroys standing crops thereby benefiting the local farmers while the humans have reciprocated by protecting the lions from poachers, resisting retaliation when they prey on cattle, and even building parapet walls around the farm-wells to minimize the accidental death of lions that may fall into them. As a result, it is stressed that the ultimate connection and dependency between human, wildlife, natural resources and bio-diversity should be acknowledge and conservative approach should be implemented accordingly to benefit the ecosystem at large.

All these activities have placed indigenous and tribal communities at the centre of environment and developmental debate over the decades in which they favour simple, sustainable, and locally available resources/knowledge to conserve the earth system. These studies validates existing research findings of the role of Indigenous Knowledge in Environment sustainability, however limited attention has been paid in the face of incoming global forces and market. It is well established that indigenous communities all over the world have inherently developed knowledge systems to make judicious utilization of the available resources so as to enhance sustainability of the environment from which they derive their basic necessities. A global concern for environmental sustainability gave birth to United Nations Conference on Environment and Development (UNCED) held at Rio in June 1992 which states that 'human beings are the centre of concerns for sustainable development and indigenous communities have a vital role in environmental management and development because of their ecologically sustainable knowledge and approaches towards the environment (Singh & Khare, 1993). The declaration of this platform further demands the world to recognize and duly support identity, culture, tradition, knowledge system, and interests of indigenous communities of the world for their effective participation in achieving the goal of sustainable development. [13,14,15]

However, these knowledge systems are, in the contemporary times, stands highly vulnerable to global forces and market, modern science and technology, developmental initiatives, impact on traditional religion, intellectual property rights, and emerging concept of private property, environmental problems, non-transfer of knowledge, gender disparities, power conflicts, and bio-piracy, etc.

Many emerging studies have argued that global oriented markets forces many countries (especially the developing ones like India) to promote development policies that focus on rural based industrialization and increased agricultural productivity through chemical inputs, biotechnology, mechanization, etc which has not only marginalized traditional agricultural system but also dis-empowers local farmers and their indigenous knowledge (Angeles & Tarbotton, 2001). The growth of commercial forestry has also contributed to erosion of indigenous knowledge in many parts of India especially in the North-east region, where the land are increasingly cleared to meet fuel requirement, construction material and also to accommodate increasing population.

The indigenous knowledge also stands susceptible to misappropriation and misuse by the modern science and rich technological bodies because of its accessibility and efficacy, particularly knowledge pertaining to treatment of various diseases, cosmetics, medicinal properties, etc. Therefore, the exploitation of traditional knowledge in the form of 'bio-

prospecting or bio-piracy' is a threat to the indigenous community and their knowledge system in which the indigenous knowledge of the communities is misused by scientist of the developed countries to developed certain drugs or so on without acknowledging the intellectual property rights of the rightful communities (Bag & Pramanik, 2012).

It is pertinent to acknowledge the fact that the impact of modern worldview and influence of other religion also contributes its share in eroding indigenous knowledge by way of bringing down the traditional concept of 'sacred groves' and 'sacred forests or space' which has its roots in traditional religion of nature worship and animistic religion.

For long, these indigenous knowledge systems of the local communities across the world have sustained the fragile earth system at large while deriving their basic requirements from its resources. It is well established that these indigenous knowledge or ecological knowledge not only sustained their daily needs but it also form a major part of their economy, social, cultural, and religious institutions especially those living in rural location and on the fringes of the society. This means the impact of environmental crisis and loss of indigenous knowledge is mostly felt by those living on the margins especially poor men, small scale farmers, tribal communities, women and other marginalised population due to the fact that exist in close proximity with nature and are the harbinger of the environment. The analysis of sacred groves (SGS) in India in the works of (Malhotra et al in Aggarwal, 2008) reports that though majority of deities associated with SGS are female, women are not considered for priesthood and generally they do not even have access to these areas. Existing research studies (Agarwal, 1989; Denton, 2002; Ramdas, 2009; Sati & Juyal, 2008; Clay, 2003, etc) have stressed that the livelihood rights of unprivileged population especially rural women are being deprived which in-turn may affects the ecological balance because they are the storehouse of indigenous knowledge. These studies further argues that gender mainstreaming in resource ownership and decision-making is the need of the hour for the world to attain the goal of sustainable development.

In this light, there is dire urgency to acknowledge and recognise indigenous knowledge of tribal groups and indigenous communities keeping in mind its ecological significance and efficacy in conservation measures. It is further recommended that the developmental platform, policy makers, environmentalists, conservationists, natural resource management committee, etc should incorporate local communities in planning and development of the natural resources besides utilizing their ecological knowledge and resource management method for conserving the resources at large. In addition, many emerging studies have put forth the urgency to give a formal platform to indigenous knowledge systems by way of adopting, re-defining, and integrating it into mainstream policy and programmes for the world to achieve greater, if not complete sustainability development.[16,17]

II. DISCUSSION

Increasingly, Indigenous Knowledge Systems (IKS) are being recognized as inherently encompassing most of the aspects and principles of SDGs. The Centre in Indigenous Knowledge Systems (CIKS) at the University of KwaZulu-Natal (UKZN), South Africa, in collaboration with the Sikh Human Rights Group, use their multi-and transdisciplinary, cultural and community-based nature, to promote the role of traditional medicine, food security, biodiversity, environmental management and curriculum studies and development (with emphasis on non-western paradigms), human rights and justice, for sustainable community livelihood and development, through research, human capital development, knowledge brokerage, networking and community engagement.

Expected Impact

The governance of the CIKS is structured as follows: The CIKS Steering Committee as an advisory board, providing strategic direction to ensure the Centre's alignment with its strategic focus areas of research and human capital development; The CIKS management committee is responsible for the operational activities of the Centre. It is comprised of representatives of the partner institutions, including the Director and Research Manager; CIKS Scientific Committee as a multi and transdisciplinary team composed of researchers, IK-holders and practitioners from within and outside South Africa. These assist the CIKS to drive its research and scientific agenda in its thematic areas based on their expertise and knowledge. Some of its members assist the CIKS in postgraduate research supervision and as reviewers of IKS research outputs for research publications.

Capacity

The multi, inter, trans- disciplinary nature of IKS for sustainable development, requires that CIKS, is supported by teams of intellectually and professionally capable national and international IKS scholars and researchers to enhance its excellence and involvement of community IK-holders and practitioners for community relevance. They play an active role in CIKS governance, and its mandated activities as research supervisors, examiners, reviewers and editors. The

national and international profile of CIKS partner institutions, including the active participation of IK-holders and practitioners, has enabled CIKS to initiate research, human capital development and community engagement exchange programmes involving researchers and postgraduate students. This is exemplified by the increasing number of CIKS researchers invited as guest lecturers, visiting professors, and keynote speakers to various international platforms including conferences, workshops, and colloquiums. The CIKS and its partner institutions publishes research papers, information sheets and books; organizes national and international conferences, conferences, workshops, and colloquiums in its focus areas on sustainable development. It works with both the public and private sector organizations from within and outside South Africa as part of its knowledge brokerage, networking, and service rendering and community engagement mandate. It has been working with the SHRG since 2012. The SHRG will take this rich IKS expertise to UN events as well as in other countries in Africa through regional workshops. Through SHRG, the CIKS will engage with projects in other parts of the world for knowledge transfer in both ways.

Governed

The Centre in Indigenous Knowledge Systems (CIKS) was established in 2014. It is a partnership of five higher education institutions in South Africa, i.e. UKZN as the hub and Secretariat of CIKS, North-West University (NWU), University of South Africa (UNISA), University of Venda (UNIVEN) and University of Limpopo (UL). It is funded by the Department of Science and Technology (DST), South Africa, through the National Research Foundation (NRF). The process of building the CIKS involved recognition of complementing potentialities of the partner institutions: The NWU, has been a champion in IKS curriculum development since 2001; the UL and UNIVEN have a rich bio-diversity including traditional medicine and African IKS-based rural communities; UKZN and UNISA had already identified IKS as a tool of transformation in their core business of research, teaching, learning and community engagement. The existing IKS related activities at the CIKS partner institutions provided an important base for the establishment of its research and human capital development focus areas. Most of the CIKS partner institutions are located in predominantly rural provinces where majority of the people depend on their IKS for livelihood in terms of healthcare, food security, biodiversity and environmental management, including climate change adaptation and mitigation. The CIKS has since its inception recognized that in order to ensure the transformative sustainability of IKS, there is need to integrate it in the educational system at all levels. This was also to facilitate the building a critical mass of IKS human capital for IKS development. The Sikh Human Rights Group brought importance of human rights and justice in sustainable development. The Secretariat at UKZN, as the coordinating unit is composed of the Director (Prof Hassan Kaya), Research Manager, Senior Administrative Officer (Finance) and a multi-disciplinary pool of postgraduate research assistants.[18]

III. RESULTS

Indigenous peoples across the globe are especially vulnerable to environmental degradation in all its forms and the associated poverty. Paradoxically, their way of life is inherently sustainable and protective of the environment; their indigenous knowledge is a uniquely rich source of understanding, appreciation of, and reverence for the natural world.

The loss of indigenous populations and the erosion of their way of life is not only an injustice for those communities, but a loss in the global fight against climate change and biodiversity decline. As we lose indigenous knowledge, we weaken our ability to tackle the triple crises of climate change, biodiversity loss, and pollution.

The planet is home to more than 476 million Indigenous people living in 90 countries. While Indigenous people make up less than 6% of the world's population, they manage 28% of the world's land surface, including 80% of global biodiversity. This territory is widely acknowledged to have suffered less than other areas in the face of recent environmental challenges.

The vital role of Indigenous peoples was recognized in the 2007 UN Declaration on the Rights of Indigenous Peoples (UNDRIP). The UN Sustainable Development Goals (SDGs) included specific mention of Indigenous peoples, and acknowledged that there can be no truly sustainable development without protecting the traditional knowledge and territories of Indigenous peoples. Increasingly, Indigenous Knowledge Systems (IKS) are being recognized as inherently encompassing most aspects and principles of the SDGs. [17,18]

This year's International Day of the World's Indigenous Peoples (August 9) focuses on the world's 7,000 indigenous languages. As farmers, fishers, pastoralists, and forest-dwellers, Indigenous peoples use traditional land management and food production which has evolved over centuries. The indigenous knowledge systems and languages that underpin these methods contribute directly to biological and cultural diversity, poverty reduction, conflict resolution, food security, and ecosystem health. Their awareness of traditional food sources and the fundamental connection between

food systems and healthy landscapes leads to diets that are diverse and sustainable. Indigenous groups are often best placed to provide information on local biodiversity and environmental change and are important contributors to the governance of biodiversity at local and global levels.

In many parts of the world, indigenous communities are at the forefront of conservation. In the Democratic Republic of Congo, the Bambuti-Babuluko community is helping to protect one of Central Africa's last remaining tracts of primary tropical forest. In Iran, the semi-nomadic Chahdegal Balouch oversee 580,000 hectares of fragile scrubland and desert. Nemonte Nenquimo, leader of Ecuador's indigenous Waorani people, has spent years fending off miners, loggers, and oil companies intent on developing the Amazon rainforest. She famously fronted a 2019 lawsuit that banned resource extraction on 500,000 acres of her ancestral lands. But Nenquimo isn't only hoping to save the Waorani, by protecting the Amazon, she's hoping to save the planet:

"If we allow the Amazon to be destroyed... that affects us as indigenous peoples, but it will also affect everyone because of climate change...The struggle we do is for all humanity." [19,20]

Despite the crucial role indigenous communities play, they suffer disproportionately high levels of land insecurity, social dislocation, and violence while defending their traditional lands. They also make up 15% of the world's poorest people, with indigenous women particularly suffering high levels of poverty, low levels of education and literacy, and limited access to health services, basic sanitation, credit, and employment, as well as suffering domestic and sexual violence.

- Globally, 47% of all Indigenous peoples in employment have no education, compared to 17% of their non-indigenous counterparts. This gap is even wider for women.
- More than 86% of Indigenous peoples globally work in the informal economy, compared to 66% for their non-indigenous counterparts.
- Indigenous peoples are nearly three times as likely to be living in extreme poverty compared to their non-indigenous counterparts.

Increasingly, experts are calling for governments to learn from the environmental examples set by indigenous communities, many of which have lived in harmony with nature for thousands of years. Siham Drissi, Biodiversity and Land Management Programme Officer with the United Nations Environment Programme (UNEP), said:

"We absolutely need to protect, preserve, and promote the traditional knowledge, customary sustainable use and expertise of indigenous communities if we want to halt the damage we're doing – and ultimately save ourselves."

Forests play a particularly important role in many indigenous systems, being critical for food security, livelihoods, culture, and spiritual identity in many communities. New technologies, such as drone-supported mapping of forest cover and territories, are being used to support sustainable land management practices and recognition of traditional land ownership rights.

In countries like Indonesia and Peru, governments and non-profit organizations are working to develop appropriate forestry policies that consider the land, resource rights, and views of indigenous peoples, providing communities with land tenure options and offering farmers, fishers, and forest-dwellers training in techniques to address climate change and forest management. [21,22,23]

IIRRs work with pastoralist communities in South Sudan supports indigenous people to find new markets for traditional products and to diversify income in order to build resilience and thereby a greater chance of maintaining a traditional way of life. Land tenure is a key factor in supporting indigenous peoples and an area that IIRR has long championed through work such as that in Uganda securing Certificates of Customary Land Ownership and subsequent land tenure in partnership with The Global Land Tool Network and UN-Habitat. The success of IIRR's Climate Smart Villages relies heavily on the mix of local customary knowledge and new techniques. [19]

IV. CONCLUSION

Thanks to the tireless efforts of indigenous peoples' groups such as that led by Nemonte Nenquimo, the value of indigenous communities, their knowledge, and languages is gaining some degree of recognition and protection. However, many call for greater urgency and see little hope for effective protection of biodiversity hotspots such as the Amazon without a similar level of protection for their indigenous populations. What is certain is that the global rate of

biodiversity loss and the speed of climate change will not slow down while the world wakes up to the value of indigenous peoples and their wisdom.

The International Institute of Rural Reconstruction, also known as IIRR, is a non-profit organization whose mission is to empower rural people to build resilient communities and attain socioeconomic equity through creative and community-led action. [24]

REFERENCES

1. Aggarwal, B. (1989). Rural Women, Poverty and Natural Resources: Sustenance, Sustainability and Struggle for Change. *Economic and Political weekly*, 24(43), WS 46-WS 65.
2. Angeles, L.C., & Tarbotton, R. (2001). Local transformation Through Global Connection: women's Assests and Environmental Activism for Sustainable Agriculture in Ladakh, India. *Women's Studies Quarterly*,29(1/2), 99-115.
3. Aggarwal, A. (2008). Indigenous Institutions for Natural Resource Management: Potential and Threats. *Economic and Political weekly*, 43(23), 21-24.
4. Bandyopadhyaya, J. (1992). Sustainability and Survival in the Mountain. *Ambio*,21(4), 297-302.
5. Boons, E.R & Hens. (Ed). (2007). Introduction. India; Kamla-Raj Enterprises.
6. Bag, M., & Pramanik, R. (2012) Commodification of Indigenous Knowledge: Its Impact on Ethno-medicine. *IOSR Journal of Computer Engineering*,7(4), 08-15.
7. Bishnoi, A. (2013, October). Forest Connections. *The Hindu Times*,
8. Clay, R. (2003). Speaking Up: Women's Voices in Environmental Decision Making. *Environmental Health perspectives*, 111(1), A34-A37.
9. Denton, F. (2002). Climate Change Vulnerability, Impacts, and Adaptations: Why does Gender matter? *Gender and development*, 10(2),10-20
10. Gupta, A.K. (2000). Shifting Cultivation and Conservation of Biological Diversity in Tripura, North-east India. *Human Ecology*, 28(4), 605-629.
11. Kumar, S. (2001). Indigenous Communities 'Knowledge of Local Ecological Services. *Economic and Political weekly*, 36(30), 2859-2869.
12. Kumar, S. (2006). *Environmental Movement in India*, (Ed Tapan Biswal). New Delhi: Viva Books Pvt Ltd.
13. Madegowda, C. (2009). Traditipnal Knowledge and Conservation. *Economic and Political weekly*, 44(21), 65-69.
14. Mahalik ,P.R., & Mahapatra, R.K. (2010, May-June). Documenting Indigenous Traditional Knowledge in Odisha. *Orissa Review*, 99-103.
15. Prajuli, D. R. & Das, T. (2013). Indigenous Knowledge and Biodiversity: Interconnectedness for Sustainable Development. *International journal of Scientific and Technology Research*, 2(8), 220-224
16. Report of the World on Environment and Development (WCED). (1987). *Our Common Future/Brundtland Commission Report*. Oxford; Oxford University Press.
17. Ramdas, S.R. (2009). Women, Forestspace and the law: Transgressing the Boundaries. . *Economic and Political weekly*, 44(44), 65-73.
18. Ramakrishnan, P.S. (2000). Ecological Threads in the Sacred Fabric. *India international centre Quarterly*, 27(4), 109-122.
19. Singh,S., & Khare, A.(1993). People's participation in Forest management. *The Common wealth Forestry review*, 72(4), 279-283.
20. Sati, M.C., & Juyal, R.P. (2008). A Gender Approach to Sustainable Rural Development of Mountains: Women's successes in Agro-enterprises in the Indian Central Himalayan Region. *Mountain Research and Development*,28(1),8-12.
21. Sharma, A.K. (2014). Indigenous Knowledge Communication in the 21st Century. *International Journal of Digital Library Services*,4(1),128-135.
22. Sinha, S. (2014, January). Cultivating Self-Reliance. *Yojana*, 58, 62.
23. Tiwari, B.K., Tynsong,H., & Lynser , M.B. (2010). Forest Management Practices of the Tribal People of Meghalaya, North-east India. *Journal of Tropical Forest Science*, 22(3), 329-342.
24. World Bank. (2003). Implementation on Operational Directive 4.20 on Indigenous Peoples: an Independent Desk Review. Report no. 25332, January 10, 2003. Washington D.C.: Operations Evaluation Department, Country Evaluation and Regional Relations (OEDCR), World Bank.



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