REPORT

Lessons for India's Transition to a Greener Economy

Inputs to the Global Transition Report

December 2014

Development Alternatives

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Lessons for India's Transition to a Greener Economy

Inputs to the Great Transition Report

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economics as if people and the planet mattered

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Development Alternatives

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1. Introduction

India, which had been growing at a rate of 8.5% until 2011, faced an economic slowdown with the growth rate falling to around 5% in 2013. The agricultural sector's contribution to India's Gross Domestic Product (GDP) has dropped from 17.4% in 2006-07 to 14.2% in 2010-11[i], while the manufacturing sector has underperformed, accounting for only 20% of GDP, due to high interest rates, infrastructure bottlenecks, slow decision-making by the government, and weak domestic demand[ii]. Furthermore, the service sector, which accounts for nearly 65% of GDP, has also been losing its momentum due to segments like the banking and real estate facing demand and investment constraints[iii].

Yes, tracking the economic numbers shows that India needs to tackle its economic issues but the problems are much deeper. The proportion of population living in extreme poverty has declined from 47% in 1947[iv] to 22% in 2012[v], yet nearly 56%[vi] of the current population cannot meet their basic needs. Similarly, while there is a demographic boom of young people in the country with nearly 285 million people between the age group of 15-29 years[vii] (2009-10 to 2011-12), the jobless nature of growth added only 15 million jobs between 2004-05 and 2011-12[viii]. Furthermore, the environment has suffered gravely with the economic progress as from 1990 to 2008, India's GDP per capita rose by an impressive 120% leading to the natural capital to decline by 31%[ix] in the same period. Adding to that, currently India is operating on almost twice its bio-capacity[x]; indicating that the population's demand from the ecosystem exceeds the capacity of that ecosystem to regenerate the resources.

To ensure that inter-linkages between the economic, societal, and environmental aspects of development are overarching, India needs vital transitions. A green economy strengthens pro-poor economic growth by building up natural capital and secures livelihood options of the poor. United Nations Environment Programme (UNEP) defines Green Economy as one that results in 'improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'[xi]. The dynamic movement towards a green economy is to focus on enabling a world that ensures the well-being of not just human beings, but also the planet. Green economy does not substitute the concept of sustainable development[xii], but looks at adoption of a holistic approach, that includes issues of social marginalisation, intergenerational equity, employment creation, poverty eradication, etc. along with the incorporation of pressing environmental concerns.

The current trend of unsustainable growth and development, i.e., the Business As Usual (BAU) approach is supplementary to severe environmental impact. It assumes no fundamental changes in policy or external conditions, and the environmental and societal well-being play second fiddle to the goals of the market. There may be gains with respect to GDP growth, and poverty alleviation may occur for a brief period of time, but these development benefits will be attained at an unaffordable price. The depleting stock of the world's natural resources due to current development patterns has had detrimental impacts on the well-being of the current generation but it poses unprecedented risks and challenges for the future generation[xiii].

Under a BAU scenario, India will imitate the historical trends of global North whilst treading on its current development trajectory. The Climate Disclosure Project indicates that under the current trends, by 2100 India's GDP growth will be around negative 9-13% due to severe climate change, impacting business, livelihood, and thus the economy[xiv]. Currently the deteriorating environment costs India a staggering 5.7% of the GDP, by impacting people and environments health and productivity. The pressure on India's environment is estimated to become the highest in the world, driven by both prosperity and poverty.

The transition to have a sustainable future in India has been carved since the past few years. The National Action Plan on Climate Change (NAPCC) launched in 2008, with 8 missions under it, primarily looking at National Solar Mission, National Mission on Enhanced Energy Efficiency, and National Mission on Sustainable Habitat. The aim of the missions is to keep the Greenhouse Gas (GHG) emissions under control while fulfilling the energy needs of the country. Further, the current 12th Five Year Plan (2012-2017) of the government aims at restructuring the policies to achieve a faster, sustainable, and more inclusive growth. The intention is to develop India's agriculture, education, and health sector along with providing social welfare to all[xv].

In India, policy options targeted towards greening the manufacturing, energy, transport, construction, etc. sectors will cost the economy a meagre 0.2% to 0.4% of the annual GDP growth[xvi] along with contributing to employment generation. By maintaining and building up natural capital and mitigating resource scarcity, these investments will provide the basis for enhanced human well-being, opportunities for job creation, and sustained economic development for the next 20 to 40 years. The movement is thus from mere economic growth towards achieving a triple win development that includes social integration, economic viability, and environmental sustainability. Redefining the way progress is looked at, with the needs of our society and our natural infrastructure, the concept of green economy is to create long-term priorities for investment that will form the basic fabric of improving levels of human well-being and natural capital systems.

This paper attempts to understand the key sectors for intervention in India and have emerged as the main players in undertaking green initiatives. These sectors have contributed to economic growth of the nation while simultaneously causing detrimental effects on the environment. Section 2 of the paper makes an analysis of the six sectors that have the potential of contributing towards achieving the balance along the three pillars of sustainability. Section 3 further analyses the dominant barriers faced by some of the initiatives and how they can possibly be overcome. Section 4 concludes this paper, laying the foundation for further research and understanding the viable agents of changes for bringing about this transition.

2. Alternative Perspectives

India has great potential for building a green economy. The current form of economy has helped India perform well economically, but there is an urgent need to explore possibilities of moving towards an economy that entails economic and social well-being for all, within environmental limits.

The South Hubs Network Programme developed under the Global Transition Initiative by New Economics Foundation (NEF) provided an opportunity to develop Indian perspectives and principles for achieving the transition to a green economy. All the more, the initiative aims to build a global civil society and stakeholder movement committed to the principles and objectives of transitioning to a green economy.

The programme with five member organisations[1] identified and documented 150 green initiatives, on an online platform 'Mainstreaming Alternative Perspectives – South Asia[2]' (MAP-SA). The aim was to dovetail alternative ways that advocate for an environmentally sustainable and socially just approach for economic development. The initiatives documented serve as catalysts in the transition towards a new green economy by establishing the practice to policy connect. With the spread across various sectors like agriculture, biodiversity, construction, energy, WASH, and waste the aspiration to have sustainability incorporated in the development trajectory becomes stronger.

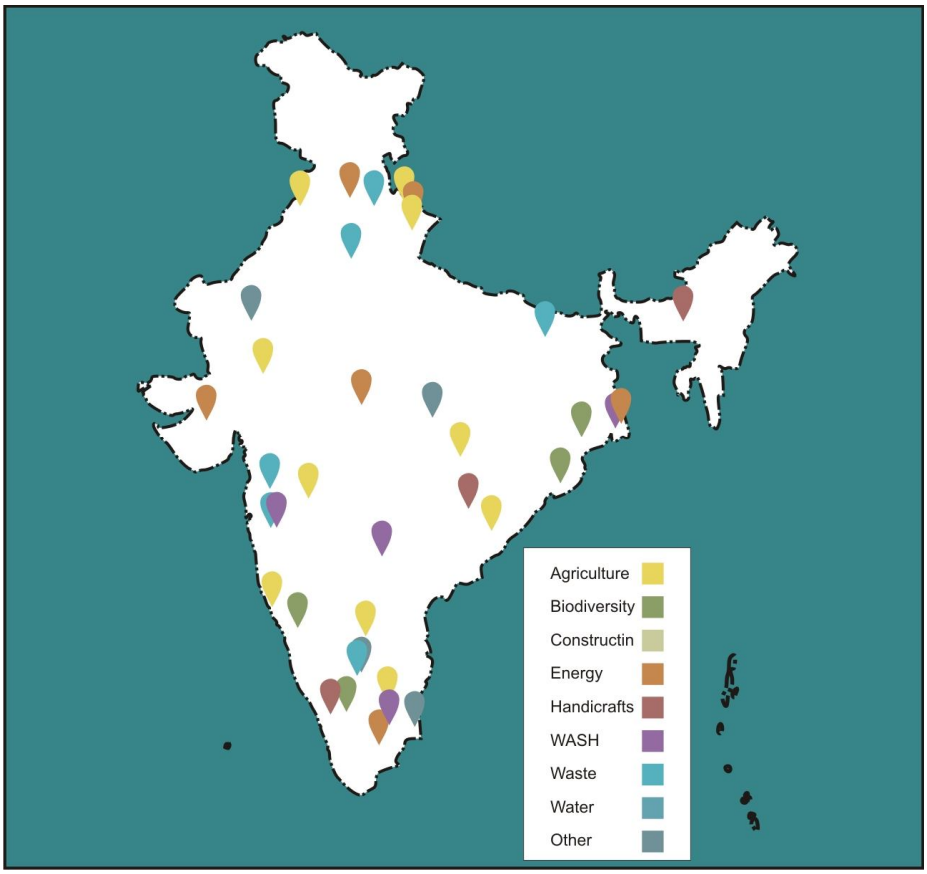

Figure 1: Map Showcasing Green Initiatives in India

[1] TARA, Keystone, Udyogini, Chintan, and HESCO
[2] www.map-sa.net

Each of these sectors has an impact along the three pillars of sustainability. Playing an important role in the economic growth of the country, these sectors contribute to the GDP growth, provide goods and services for trade, prevent economic costs of restoration and regeneration, etc. With majority of the population depending on these sectors for employment, they generate vast livelihood opportunities thus promoting green jobs. Furthermore most of the basic services stem out these specific sectors thereby catering to the societal obligations. Greening of these sectors has major implications for ensuring that the awareness regarding green economy trickles down to everybody. India has been treading on the path of severe environmental degradation. It is primarily these sectors that are instrumental in creating the transitions needed to ensure resource efficiency, curb carbon emission, protect and preserve the ecosystem, and safeguard the planet.

The range of initiatives documented promote practices that are equitable, build capacities, advocate sustainable consumption and production patters, innovating technology, creating livelihoods, and foster well-being for the people and the planet. Extracting the lessons that have emerged from the documenting process along with the best of the best practices amongst the various initiatives has been highlighted to advocate the importance of each sector in the transitions for changing the development paradigm.

Agriculture

The agricultural sector forms the basis of providing basic needs to people. While it essentially ensures food security, it also helps in producing fibre for clothing, feeding livestock, bio-energy, etc. With 56% of the Indian rural population depending on agriculture for their livelihood, it is critical that the right of the rural communities to a clean environment is maintained to enable them to have a sound livelihood. The Green Revolution in India in 1950s led to the introduction of High Yield Variety (HYV) seeds, increase in use of fertilisers and pesticides, expansion of irrigation systems, and modernisation of management techniques. Since then this sector has brought great national economic prosperity but over the years has simultaneously lead to severe destruction of the environment and health of people. India's consumption of fertilisers increased from 65.6 thousand tonnes in 1951-52 to 26.49 million tonnes in 2009-2010[xvii]. With increased use of fertilisers along with mechanisation in the sector, overall food production has risen. However, this has jeopardised the economic security of the farmers, due to high investment in fertilisers, machines, and seeds. Furthermore, factors such as deforestation, reduction in nutrient content of the soil and depletion of ground water has lead to severe soil erosion and decreased availability of water for irrigation.

Agro Biodiversity Conservation

The GREEN Foundation, through its initiative of Agro Biodiversity Conservation empowers primarily women farmers to adopt sustainable practices in farming, thereby strengthening their economic security and nurturing the community-based institutions. The foundation's work with farming communities involves a multi-pronged approach that enables farmers to attain food security, economic security and, ultimately, autonomy. Primarily through capacity building and extensive traditional knowledge sharing the farmer's dependency on expensive chemical fertilisers and pesticides decreases, along with developing entrepreneurial skill and improving market linkages for their produce. The initiative has grown from a handful of women in 1997 to more than 2460 families currently.

Sustainable agricultural production methods have great mitigation and adaptation potential, particularly with regard to topsoil organic matter fixation, soil fertility and water-holding capacity, and increasing yields in areas with medium to low-input agriculture. The various initiatives, spread across the country advocate the promotion of such sustainable agricultural techniques like organic and natural farming along with an extension of green agricultural technologies and services (*nala* bunding, land levelling, etc.) that can help increase fertility of land along with increasing yield. The expanding capacities and capabilities of the farmers and providing better access to market through strong market linkages, the initiatives have also ensured livelihood security of the farmers.

Biodiversity

Biodiversity reinforces the functioning of an ecosystem that is necessary for creating well-being and prosperity for all. Yet, in recent decades India has experienced unprecedented loss of biodiversity and severe ecosystem loss. The pressure of supporting 17% of the global population on just 2.4% of world's land has been a major source of environmental degradation[xviii] in India. The growth of the industrial sector through its intensive resource and energy use placed a heavy load on the environment[xix]. Given that per person footprint is 0.75 global hectares, and per person bio-capacity is 0.4 global hectares, India is running an ecological deficit of approximately 100%[xx]. In the recent times, there have been conflicts between the conservationists and the tribal communities that have emerged as a potent factor in curbing the formalisation of livelihoods based on biodiversity. It is essential to maintain the ecological functions that include stabilising water cycles, maintaining and replenishing soil fertility, ensuring forest regeneration, protecting wildlife, etc. given that close to 275 million people depend on natural ecosystems for day-to-day subsistence.

Swabalambi Producers Company Ltd.

In the Simlipal region, in Odisha there are several villages where the livelihood of the villagers depends on NTFP collection and rain-fed agriculture. The unsustainable harvesting of NTFPs coupled with low returns to the gatherers, mainly *adivasi* women motivated Gram Swaraj to start this initiative that organised mainly women NTFP collectors into SHGs and empowering them with training, information, and innovative ideas. Working in 36 villages, the initiative has formed and strengthened 260 SHGs, impacting over 2000 NTFP collectors. Gram Swaraj has established a value chain that has eliminated middlemen, increased the bargaining power in markets to ensure better returns, as well as empowered the women to diversify their produce. The enterprise deals with products like *sal* leaf, *mahua* (flower & Seeds), bamboo, grasses, creepers, mushrooms char seeds, tamarind, honey, medicinal plants etc., all of which is collected sustainably. In 2012-2013 the transaction of this initiative was 30 lakhs with the income of the collectors increasing between 25-30%.

The initiatives documented highlight that majority of forest products are usually Non-Timber Forest Products (NTFPs) collected by '*adivasis'* or tribal communities. Poverty, lack of sustainable alternate livelihoods, and absence of financial incentives threaten the meek attempts of these tribal communities for biodiversity conservation. There is therefore a need to skilfully organise them into formal collectives for a coordinated trading mechanism and enhanced income opportunities. The initiatives documented have primarily assisted in empowering the rural communities through efficient capacity building and providing strong market linkages for forest products. They have further ensured

sustainable management of environmental and forest resources, there by contributing immensely to conserving the biodiversity.

Construction

The construction sector is a crucial component of India's development pathway, accounting for 8.2% of the country's GDP in 2011-2012[xxi]. With urban population estimated to reach 600 million in 2050 from the current 410 million[xxii], the demand for construction is only going to increase. This is a labour intensive sector that requires a workforce along the value chain ranging from labourers, contractors, architects, etc., thus being the second largest employer after agriculture. Further it is also resource and energy exhaustive, contributing to about 24% of the total national GHG emissions[xxiii] and using 30% of national electricity, along with consuming large proportions of cement, steel, lime, and bricks.

Build Together Pay Together

The Build Together Pay Together (BTPT) Eco-housing Model developed by Development Alternatives, is designed to set in place a comprehensive model that delivers cost and energy efficient building products and services of securing micro-loans for rural and peri-urban communities. Based on a joint liable groups system that essentially validates the choice of borrowers, brings in efficiency and co-ordination in the construction process and leads to peer-pressure among the group members in the repayment process. Under this initiative, 30 eco-houses were built with each owner having direct access to loan. Promoting alternative methods of construction such as rat-trap masonry, stone *patti*, etc. 98 mega joules per cu.m of energy was saved and 73 kg per cu.m of CO_2 emissions were reduced per house. Along with this, the social benefits of this model are manifold with intense capacity building and mobilisation of community towards the acceptance of eco-housing. Providing financial linkages and service delivery models, streamlines the model to achieve economic benefits as well.

In response to the same, the on-ground initiatives of construction showcased on MAP-SA promote a holistic approach that advocates efficiency across the triple bottom line. The green construction initiatives, though at a small-scale, protect the environment by reducing CO_2 and GHG emissions, prevent soil erosion, and promote the utilisation of otherwise discarded industrial waste. Innovation of technology in this front has been brought out in the initiatives. Furthermore, methods of adopting sustainable designs and advocating access and availability of finance to enhance green construction, and promoting holistic service delivery models have been highlighted. These initiatives cater to various socio-economic benefits that create secure livelihood opportunities through capacity building, labour protection, along with ensuring production of high quality yet affordable building and building materials.

Energy

Increased renewable energy portfolio and better access to energy are the key building blocks to developing India towards a green future. The surging energy demand that is fuelling the 6-7% annual economic growth had propelled India to rank 3rd in the list of top carbon polluters[xxiv]. Yet, approximately 28% of the Indian population in 2009 (largely rural) lives without access to electricity[xxv]. This lack of access to electricity, especially in rural regions, causes people to rely on the

unsustainable and environmentally unfriendly fuels of kerosene and wood. This contributes to the increasing carbon emissions of the country, but moreover makes families vulnerable to respiratory illnesses due to indoor air pollution. The issue of increasing indoor air pollution is heightened by the fact that even now 74% of the rural population use traditional *chulhas* [xxvi] (stoves) for cooking purposes.

DEEP Modern Chulha

Society of Development and Environment Protection (DEEP) developed the 'Modern DEEP *Chulha'* that uses biomass to reduce consumption of wood by 50%, approximately 3 quintal of wood per month per household. This *chulha* reduces emission of smoke by 80% in the household environment, consequently reducing environmental and health problems drastically. The initiative trains masons and welders, to produce the *chulhas*, thus securing livelihood opportunities to strengthen the local economy of the region. The initiative has helped transition the Solan district of Himachal Pradesh by directly impacting 35,000 households since 1995.

In order to address the objective of securing access to sustainable energy and improving energy efficiency, the opportunities lie in optimal technological innovation, coupled with appropriate application of the same. Production and consumption of locally available renewable sources, and capacity building of the consumers to manage the energy needs, aspirations, and resources is propagated through the initiatives. Environment friendly ways, such as setting up of solar panels, designing gasifiers based on biomass, promoting energy efficient stoves, etc. of providing access to clean energy are being demonstrated by these initiatives.

Waste

Waste management is one of the most neglected areas of urban development in India. There already exists a vast amount of waste in India that has not been managed effectively. With the urban population trending to increase bountiful, the systems and resources in India are not enough to tackle the enormous amounts of solid waste to be potentially generated. This is further accentuated by the prominence of informal labour in waste management who lack capacities and knowledge regarding efficient waste management.

SWaCH Cooperative

SWaCH integrates informal waste pickers into Pune city's Solid Waste Management system by engaging an entrepreneurial workforce of waste pickers into an efficient, responsive, and accountable organisation. Supported by the government for formalisation of waste pickers, coupled with the willingness of labours to participate in the organisational model has made this initiative a success. SWaCH in partnership with *Kagad Kach Patra Kashtakari Panchayat* has organised 9000+ waste pickers to work with dignity and created a sustainable decentralised waste management model in the country. Furthermore, the initiative contributes to efficient disposal of wet waste through biogas regeneration along with recycling of solid waste collected.

The total Municipal Solid Waste (MSW) generated solely in urban India is estimated to be 68.8 million tonnes per year[xxvii] and 91% of the MSW collected is landfilled on open lands and dumps, or openly burnt or caught in landfill fires leading to pollution of air, soil, and water. Further, the lack of awareness regarding the importance of waste segregation amongst the waste generators, i.e., industries, households, hospitals, etc. exposes waste pickers to contamination and hazardous materials.

Efficient waste management becomes an enabler of systemic transition towards a green economy, by creating green jobs along with being a catalyst of material efficiency and pollution reduction. It

embraces resource efficiency as an economic and social motor in and of itself; giving rise to the recycling industry that attracts capital, induces technological innovation, and formalises the informal waste pickers. The initiatives propagate the importance of waste management at household level by imbibing the habit of waste segregation and by promote recycling as the very fabric of its existence; they also work towards providing better living and work standards to the waste pickers.

Water, Sanitation and Hygiene (WASH)

Clean and efficient water supply, sanitation and hygiene stems from firm and sound evidence that these are central to development of a country. In India, with 594 million people defecating in the open, there is a very high risk of spread of diseases and disorders [xxviii] , along with having negative impact on the environment. Pneumonia, diarrhoea, cholera, etc. are some of the diseases that are borne due to bacteriological contamination, absence of toilet use, and lack of proper hygiene[xxix]. 74% of rural India doesn't have access to toilets, further increasing the problems of open defecation. Social stigma, poverty, landlessness, and deep-rooted cultural norms have made open defecation an acceptable practice in India[xxx]. While access to proper sanitation is a problem, the efficient management of waste generated primarily in urban areas is another bottleneck, with less than 10% of sewage water being treated and rendered harmless before it is discharged into water bodies and rivers[xxxi].

Enbiolet

Green Solution Foundation (GSF) has created a bio-toilet solution for hygienic sanitation in villages and slums in cities that lacked sewage systems. Stakeholders, donors or the beneficiaries themselves fund these bio-toilets while GSF provides training on toilet etiquette and servicing thereby directly involving the local population and making them stakeholders in the project. Their pilot innovation, the Bio-Digester Tank forms the basis for this eco-friendly toilet. Using aerobic bacteria, this tank converts human waste into environment standard compatible water, which is used for flushing, or even for irrigation. With environmental benefits running across things like water conservation due to less flushing, provision of efficient sewage system, decrease in soil and water contamination; the initiative can be scaled up nationally. Similarly while it is contributing to ensuring decrease in diseases through access to hygienic sanitation facilities, GSF is also providing green jobs to 130 people per 1000 toilets.

To tackle these problems, there are innovative solutions, showcased through the initiatives, which orient communities to adopt proper sanitation method and dispose human waste in the most effective manner. The endeavour to change the social stigma that exists amongst the rural population is also done by incentivising people to use toilets. These decentralised approaches of installing community toilets can help reduce environment degradation caused by open defecation and have healthy lifestyles. Decomposing human waste in a short period of time and enable recycling of waste water reduces intestinal nematode infection and other diseases like typhoid, cholera, diarrhoea, etc.

These six key areas of intervention for transforming India into a green economy have the potential of scaling to a national level. The initiatives documented highlight the economic, social, and environmental benefits they propagate, however there remain various barriers that are curbing the growth of these initiatives. The lessons learnt from the documentation of the initiatives have provided a sense of direction needed for overcoming them. The next section analyses the major barriers faced by the initiatives, and ways of tackling them.

3. Mainstreaming Alternative Perspectives

The best case practices that have managed to achieve the potential practice to policy connect have been used as case studies to learn from and imbibe experiences to achieve the great transition towards a green economy and an environment that advocates the production and consumption of green, clean, and sustainable goods and services. The lessons learnt highlighted the dominant barriers that hinder the multiplication and replication of these initiatives at the national level. The transition demands ways of overcoming barriers that are stagnating the movement towards a green economy and adopt mechanisms drawn out of these initiatives that can help in scaling up and scaling out of the initiatives.

1. Technology

Economic growth and development, of any country, is essentially a process of structural change that occurs based on new technological innovation and capabilities supported by optimal capital and labour accumulation [xxxii]. Technical creation, transfer, and human capabilities form the backbone of various sectors like construction, energy, WASH, waste, etc. The very large disparities in the abilities of various stakeholders/institutions to generate appropriate innovative technology hinder the transition towards a green economy, while wherever there is access to appropriate technology, the absorptive capacities on the recipient side is rather weak. A mechanism that can actively disseminate resource and energy efficient technologies to the enablers of green economy is missing along with a lack of active institutions and centres that adapt and promote the use of equipment and/or technological packages optimally. This is significant from the fact that India accounts for only 3% of global R&D spending on technological innovation, of the $1.3 trillion in 2011[xxxiii].

For example, in the WASH sector - while efforts are being made to provide proper access to sanitation to households especially in rural areas, the lack of technical capabilities to manage and effectively dispose sewage water is a major hindrance. Similarly, in the energy sector, a few initiatives, such as '*DEEP Modern Chulha'*, have administered the use of fuel-efficient stoves in rural areas, however the serious lack of innovations and alterations in the working of these stoves may cause the technology to become obsolete.

Green growth is unlikely to occur without technical innovations that help in decoupling growth from natural capital depletion and environmental pollution[xxxiv]. In the recent past, cleaner and resource efficient technology development have been trending in India[xxxv]. Shedding light on this fact are a few initiatives that have laid the foundation for technologies that can essentially be scaled up. These technical innovations and adaptations are increasingly based on altering traditional techniques to modern needs and demands. The *'MittiCool Refrigerators'* is one such example that develops refrigerators made entirely of clay, working on the principle of evaporation to keep the contents inside the refrigerator cool. With assistance from Gassroots Innovation Augmentation Network (GIAN) for product development and National Institute of Design (NID) for product design, the initiative adapted various types of structures and proportions of clay in order to make the refrigerator durable. Building upon this, with support from the National Innovation Foundation – India, the initiative now manufactures earthen pots, clay water filters clay cookers, and clay *tawas.*

This innovation addresses the current challenge of affordability and sustainability by using eco-friendly resources that doesn't require external power source.

2. Finance

The increasing targets for greening the economy is being recognised in financial terms. The financial sector plays a critical role in facilitating the progress in niche asset classes like microfinance, clean energy, appropriate technology, etc. However, access to financial capital and provisions of significant financial investments remain as a major obstacle in the attempts to scale up green initiatives. The lack of availability of financing opportunities, especially for the weaker section due to issues of credit worthiness is a hurdle that stalls the movement towards a green economy. The absence of financial efforts that facilitate the free or low cost access to technology[xxxvi] coupled with lack of innovative financial tools along the supply chain, i.e., to the developer, MSMEs, etc., is also hindering the growth of the green sector. The capabilities of small-scale green initiatives, whether it is the enterprises in biodiversity sector or energy, to generate or even obtain finances to expand and promote the initiatives are rather weak. With limited support from the government, and inadequate funding from other stakeholders, the potential of most of these initiatives has not been harnessed.

There have been reforms within the market to offer the opportunities to redirect capital flows towards building greener, more resilient economy. A few initiatives have generated funds by establishing collection methods through Self Help Groups (SHG) in order to provide easy access to loans and funding. Redefining the existing methods and tools of financing such as micro-finance, joint group borrowing, etc. to make them more attractive to the borrowers has seen an increasing trending among the green initiatives. While most of the initiatives have tried to overcome the barrier of financial standstill by approaching the local government for funds or by partnering with donor agencies, an initiative called '*Rang De*' has been set up specifically to generate funds for first time borrowers through microcredit. With the model of peer-to-peer lending that can be leveraged on to lower the cost of microcredit, *Rang De* has raised Rs. 270 million for loans, spread across 15 states and received Rs. 202 million repayment[xxxvii] from the borrowers. It works along the concept of using internet to source finances from individuals for an amount as little as Rs. 100, thus being an attractive proposition for the lenders as well and disburses loans to the borrowers through the field partners. Ensuring transparency in the system, the field partners do not charge documentation and loan processing fees. The availability of finance to the borrowers, with limited hassle in accessing the finance has made this initiative a success.

3. Capacity Building

The transition to a green and resilient economy demands dynamic human resources who are adaptive and skilful. As green economies continue to evolve, the skill gaps are increasing and there is need to support the green economic activities with specialised skill sets[xxxviii]. To achieve social, environmental, and economic development collectively, there must be awareness of the concept of a green economy, prevailing developmental issues, and possible solutions. Green

technologies are commonly produced in developed countries, thus establishing a productive capacity enhancing mechanism in developing countries[xxxix] is critical. This entails building the abilities (technical and managerial); generating awareness about the need for a green economy; influencing behaviour to act responsibly; and strengthening systems, of organisations, institutions, groups, and individuals[xl].

For example, due to the influence of the Green Revolution in India, farmers correlated the use of pesticides and fertilisers to a direct increase in yield and there existed a lack of awareness regarding the long-term detrimental environmental and health impacts of chemical farming. This was a major barrier in most of the initiatives captured in the agricultural sector. The initiatives working in this field had to raise awareness through various capacity building activities regarding the detrimental effects of chemical farming before they could venture into organic methods.

Raising awareness is not the only aspect of capacity building. The need to enhance the skills of people and ensure dynamic nature of adapting to the modern technologies is a critical part of capacity building. In the '*Nigliri Biosphere Reserve'* of the biodiversity sector, the tribal communities traditionally sold NTFPs as raw materials. However, with the introduction of the producer company in the region, the people were trained in value addition of these products to ensure a longer shelf life as well as met the needs of a larger market. Individuals from the community were also trained for managerial skills to run the producer company locally. The increasing capabilities of the tribal communities ensured livelihood security as well as increased profits.

The building of capacities on the larger institutional level, involves strengthening of pre-existing institutions. The '*National Foundation for India*' helps strengthen local governments to make them more efficient, accountable, and productive. Alongside, it works with the communities to educate them to know their rights and empower people to build collective abilities that can further make the governance systems liable. Capacity building, through raising awareness and/or developing skills thus helps enhance and strengthen the abilities and assets of individuals, groups, and institutions, thereby empowering them.

4. Market

Movement from the current economy to a green one entails the need to develop a market that provides a platform for supplying green technologies and products, and ensures that the demand for the same is generated. There has been an emergence of a new market that aspires for low-carbon clean technologies and products[xli]; however the vigour of it is still frail. The weak access to market for supplying the end product, as well as for obtaining clean and green technologies hinders the growth of the green initiatives. For example, in the case of the agricultural sector, where most initiatives such as *'Organic Agriculture Movement'* are promoting the adoption of organic farming, the marketing of the organic products have issues related to logistics, processing and, quality control due to weak trading mechanism. The poor market linkages coupled with inadequate consumer awareness regarding organic products weakens the potential of this sector. Furthermore, in most cases the middlemen make most of the profit, leading to the farmers to be

demotivated to continue with chemical free farming. Similarly in the waste sector the products produced by recycling solid waste does not reach the consumers due to weak and fragmented market linkages. With limited selling opportunities due to lack of acceptance and awareness of green products and incompetent market linkages, the entrepreneurs or producers don't have prospects to scale up the green initiatives.

Support by the initiatives to provide efficient market linkage has been is critical in avoiding expensive and sometimes perverse outcomes. *'I Say Organic'* was started to bridge the gap between the producers and consumers to play the role of a connector between farmers who grow organic produce and consumers of organic products. It has collaborated with various local NGOs to establish associations with farmers and procure organic vegetables directly from them to sell the produce at an affordable rate on an online portal. By breaking the existence of middlemen, the initiative provides direct access of market to the farmers and ensures the farmers receive higher returns and margin on the produce.

Likewise, in the Nilgiris, Tamil Nadu, products grown and collected by the tribal communities were sold at a very low price with low returns to the community. *The Keystone Foundation* focussed on establishing a programme to develop capacities of the producers in fair-trade and organic principles. The foundation also set up a chain of retail shops and networks all over India to market and promote the products produced by the tribal communities. Building and strengthening its network, the foundation set up an enterprise *'Last Forest'* for establishing a market in order to empower the communities and ensure a consistent market linkage for the green products.

Through the South Hubs Network Programme, it has been identified that in a diverse country like India, several alternatives exist that cater to the well-being of the people and the planet. However, the scales at which these are operating only influence local communities and do not support India's transition to a green economy. Therefore, for the process of the country's transition, it is imperative that the emerging lessons from these initiatives and the alternative models are mainstreamed into policies and practice for the impact to be scaled at a country level.

4. Conclusion

The transition to a green economy will result in many win-wins. Movement towards a green economy has the potential of achieving sustainable development and eliminating poverty on a vast scale, with speed and effectiveness[xlii]. In India, the playing field is steadily transitioning with considerable growth in the recognition of the fact that the environment forms the basis of physical assets and that there is a critical need for managing it for pursuing economic growth and social well-being.

The stirring towards achieving a green economy has laid its foundation at a small scale, across the country. With green initiatives spread across a range of important sectors, i.e., agriculture, biodiversity, construction, energy, waste, and WASH, the prospect of adopting a green pathway in the development trajectory has become rudimentary. The initiatives overarch the three pillar of sustainability by promoting practices that secure economic, social, and environmental benefits and encourage the notion of equity, capacity building, appropriate technology innovation, providing genuine market linkages, etc.

The transition towards a green economy is not a few steps process. The barriers or obstacles in terms of capacities for technological innovation and absorption, access to finance, inadequate awareness and skills, and ineffective market linkages have emerged as the key areas of intervention that can ease the transition towards a green economy. The means of accomplishing a nation wide green economy would entail the understanding and mechanisms to move from *initiative* to *strategy* and from *spend* to *invest*, thus making it a long-term endeavour[xliii].

Way Forward

Green economy is a dynamic concept that will require the involvement of certain agents of change, i.e., the government, private sector players, and the civil society. The role played by each of these drivers influences the policies targeted towards achieving a green economy. This paper has analysed the key sectors that are necessary for transitioning towards a green economy in India, the potential barriers and ways of overcoming them through the lens of small-scale initiatives across the country. It has provided fresh alternative perspectives on the scope and potential India has on a small-scale local level across a varied range of sectors.

With a bird's-eye view on the transition towards the green economy, further research will need to be undertaken to provide more specific guidance on the transformation to a green economy. There may be a need answer the following questions, among others;

- ***What role do the key agents of change play in making the transition smooth and fair?***
- ***What kind of policies does India need to promote and adopt the concept of green economy?***
- ***How can we ensure accountability to measure the progress in this transition?***

A green economy can create economic growth and social well-being that is at par with the BAU scenario, while having the potential to outperform the latter in medium and long term along with ensuring the well-being of the planet. However, this transition will demand a collaborative engagement and persistent efforts on the part of policy makers to rethink and re-analyse the conventional ways of growth and progress.

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About Development Alternatives Group

Development Alternatives (DA) is a premier social enterprise with a global presence in the fields of green economic development, social equity and environmental management. It is credited with numerous technology and delivery system innovations that help create sustainable livelihoods in the developing world. DA focuses on empowering communities through strengthening people's institutions and facilitating their access to basic needs; enabling economic opportunities through skill development for green jobs and enterprise creation; and promoting low carbon pathways for development through natural resource management models and clean technology solutions.

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