



# Climate and Environmental Action in the Indian SGB Sector

ANDE Issue Brief

## About the Brief

This issue brief is a part of a series formulated by the Aspen Network of Development Entrepreneurs (ANDE) India chapter. It aims to contextualise the findings and strategy regarding our key urgent issues and the small and growing business<sup>1</sup> (SGB) sector outlined in ANDE's globally focussed issue brief, Climate and Environmental Action in the SGB Sector,<sup>2</sup> at a regional level. This brief is a starting point for conversations on environmental action and is meant to help shape ANDE India's strategy for the region. This is not meant to serve as an exhaustive collection of the research/literature on the topic, and proxy data points have been used to best represent the state of the SGB sector.

This issue brief has been developed in partnership with **Villgro Innovations Foundation, Enviu, and Green Artha.**



## About ANDE

The Aspen Network of Development Entrepreneurs (ANDE) is a global network of organisations that propel entrepreneurship in emerging markets. ANDE members provide critical financial, educational, and business support services to small and growing businesses (SGBs) based on the conviction that SGBs can create jobs, stimulate long-term economic growth, and produce environmental and social benefits. As the leading global voice of the SGB sector, ANDE believes that SGBs are a powerful, yet an underleveraged tool in addressing social and environmental challenges. Since 2009, we have grown into a trusted network of nearly 300 collaborative members that operate in nearly every emerging market. ANDE grows the body of knowledge, mobilises resources, and connects the institutions that support the small business entrepreneurs who build inclusive prosperity in the developing world. ANDE is part of the Aspen Institute, a global nonprofit organisation committed to realising a free, just, and equitable society.

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# OVERVIEW

With over 10 years of active involvement and experience, ANDE is committed to further deepening our role in the entrepreneurship and development ecosystem. Our updated global strategy, which informs ANDE's global and regional work for the coming years, aligns with the United Nations' Sustainable Development Goals (SDGs), specifically focusing efforts on three urgent issues: decent work and economic growth, gender equality, and climate and environmental action. This brief focusses on the last.

Climate change is affecting every country on every continent. Erratic weather patterns have become commonplace and sea levels are rising to unprecedented levels, disrupting economies and negatively impacting lives and livelihoods. Unpredictable monsoons and unsuitable increasing temperatures will affect farmers, particularly the small landholder farmers living in regions with weak infrastructure and less irrigation.<sup>3</sup> Millions who inhabit the coastlines of the country are already being affected by rising sea levels and extreme weather conditions, with these conditions adding stressors to already strained central and state public support services. Thus, the role SGBs play in addressing environmental challenges through their operations, products and services, and supply chains has become all the more important.

In relation to the SDG framework, SGBs involved in the environmental sector can directly influence the progress of the following SDGs:

- SDG 6: Clean water and sanitation
- SDG 7: Affordable and clean energy
- SDG 13: Climate action

Indirectly, SGBs working in these climate-related sectors also have effects on other SDGs, including:

- SDG 1: No poverty
- SDG 2: Zero hunger

- SDG 3: Good health and well-being
- SDG 8: Decent work and economic growth
- SDG 12: Responsible consumption and production
- SDG 14: Life below water
- SDG 15: Life on land
- SDG 17: Partnerships for the goals

India has a mixed history when it comes to progress on environmental topics; while it has made significant progress in certain areas, its growing economy and accompanying pressures threaten some of these gains. India is a clear leader in the adoption of renewable energy, creating models for the lowest cost of renewable energy in the Asia-Pacific.<sup>4</sup> It is also a leader in consumer energy efficiency, with the Ujala Scheme making India among the largest adopters of lighting systems based on Light Emitting Diodes (LEDs).<sup>5</sup> India's per capita emissions stood at 1.8 tonnes of CO<sub>2</sub> in 2017, well below the global average of 4.8 tonnes.<sup>6</sup> Emissions, however, have been on the rise and are expected to accelerate further in response to economic growth. While India has low per capita emissions, in aggregate it stands to be the third largest global emitter, following the United States and China.<sup>7</sup>

According to the government report Assessment of Climate Change over the Indian Region, India's average temperature has increased by 0.7 degrees Celsius between 1901-2018, due to greenhouse gas (GHG) emissions.<sup>8</sup> If significant correction measures are not implemented, there could be worse heat waves, droughts, and an increasingly degraded coastline, putting the country on the path to becoming 'increasingly unlivable'.

Given that climate and environmental action is a vast sector, this brief will focus on three specific sub-sectors that we have identified as of high priority to the Indian SGB ecosystem, through interactions with ANDE members and other stakeholders who work on the ground.

**FOCUS AREAS OF THE ISSUE BRIEF**



**RENEWABLE ENERGY**



**CIRCULAR ECONOMY**



**WATER AND SANITATION**

# CURRENT EVIDENCE BASE: WHAT IS THE STATUS QUO?

## Renewable Energy

India's primary energy demand increased by 4%, compared to a global average of 2.3%, accounting for 11% of global energy demand growth in 2018.<sup>9</sup> India is primarily reliant on coal for power generation, oil for transport and industry, and biomass for residential heating and cooking.<sup>10</sup> Although India is looking at an increasing amount of renewable energy being added to reach its planned 450 gigawatts target by 2030,<sup>11</sup> the country is still currently dependent on fossil fuels for a majority of its electricity generation.<sup>12</sup> This power sector is responsible for half of India's fuel related emissions.<sup>13</sup>

The energy transition, or movement to integrate more renewables into the energy grid, is a complex process. Many renewable energy sources are often variable in nature as they are affected by wind, sun, and water flow. To keep the grid stable, energy supply and demand must be kept stable. To transition away from coal, technology suitable to Indian conditions to help manage the availability of electricity during peak hours, nights, and unusual weather events is required to tap into nuclear power, large scale hydro or scalable battery solutions. A myriad of SGBs are required in this space to provide reliable power sources and maintain grid stability.

India is not only looking at renewable energy to manage the growth in energy demand while limiting emissions, but also as a way of increasing energy efficiency. Smart metering and demand-side management are grid-level interventions that will be required to keep energy consumption in check, while energy efficiency interventions can range from light bulbs and appliances to the processes for making cement. All of these are areas in which SGBs can play significant roles.

Historically, the Indian renewable energy sector has been dominated using biomass in the residential sector, especially traditional biomass for heating and cooking in households.

Cogeneration of bagasse, residue from sugarcane extraction, has been one of the most successful biomass energy projects in sugarcane-producing countries such as India and Brazil.

Under the Pradhan Mantri-Kusum Yojana scheme, the government is targeting to fund installations of 15 lakh solar pumps for farmers across the country.<sup>14</sup> The scheme also enables the farmers to set up solar power generation capacity and sell it to the grid.

India is a pioneer in off-grid solar home systems. To increase energy access in the most affordable and stable manner, decentralised renewable energy (DRE) is gaining momentum. DRE provides a space for SGBs to innovate solutions that move the country towards more sustainable energy production and consumption. DRE solutions operate in a localised fashion and include products such as solar lanterns, solar home systems, micro-grids, solar lighting and solar rooftops. DRE-focused SGBs play the vital role of providing clean energy to underserved communities. There has also been an increasing focus on DRE for productive use as these SGBs enable investments in appliances that improve livelihoods and employment.<sup>15</sup>

Innovations are taking place to support integrating renewables into the grid. Clean renewable mini-grid models are being deployed, increasing rural livelihoods and agriculture value chains. These models help address national electrification objectives and create playbooks for other emerging economies. The advent of electric vehicles is already providing new opportunities for DRE companies, not only in urban areas but through increased use of electric two-wheelers in rural areas as well.

## **Mobility**

When talking about energy, it is also important to consider the mobility sector, a major consumer of fuel and a significant polluter. There are 21 Indian cities in the list of top 30-most polluted cities across the world, and transportation sources account for about a third of the particulate matter pollution in India and a high proportion of the nitrogen oxides in the air.<sup>1617</sup> Personal mobility



demand in the country is anticipated to rise in the coming years, with India potentially expected to become the third largest car market in 2030, after China and the United States.<sup>18</sup>

The government of India has instituted a number of initiatives to begin the transition to electric vehicles (EV). This includes policies related to the life of a vehicle, the ability to convert petrol and diesel vehicles to electric, the requirement that fleet operators in certain segments begin adopting EV, establishing charging stations, replacing government vehicles that are being phased out with electric vehicles, and waiving various taxes and charges for EVs.

Before the pandemic struck, the Indian automobile industry was already facing significant pressure, due to the increasing transition to ride-sharing options (Uber, Ola, etc.) in urban areas, poor economic conditions, and the high price of vehicles owing to a transition from BS4 to BS6 engines.<sup>19</sup> During COVID-19, the automobile and mobility sectors in India have been among the hardest hit. Stringent lockdown measures rendered consumers unable and unwilling to purchase vehicles. However, with the mass scale of reverse migration, and increased interest in last-mile delivery across the country, a steady rise in demand for affordable two-wheeler and three-wheeler mobility options is expected.<sup>20</sup>



These data points highlight the need for the sector to transition to clean mobility solutions, with an electric, shared, and connected outlook. A NITI Aayog and Rocky Mountain Institute report estimates that the country's transport sector can save 1.7 gigatonnes of cumulative carbon dioxide emissions and steer clear of 600 million tonnes of oil equivalent by 2030 through clean passenger and freight transport.<sup>21</sup>

## Circular Economy

By 2030, India's annual material consumption is expected to double to 14.2 billion tonnes, from 7 billion in 2015.<sup>22</sup> India currently recycles only 20% of its consumption items and the country's resource extraction (refers to activities that involve withdrawing materials from the natural environment) is 1,580 tonnes/acre, which is around 251% higher than the world average.<sup>22</sup> India generates around 277 million tonnes of municipal solid waste every year.<sup>23</sup> A rising population, mostly in the urban areas, and accompanying rising consumption have translated to a 256% increase in the average growth in waste generation in 18 Indian states from 2000 to 2011.<sup>24</sup>

Adopting a circular economy approach to economic activity will have a significant positive economic, social, and environment impact. According to the Ellen MacArthur Foundation, the circular economy model is based on three principles – “design out waste and pollution, keep products and materials in use and regenerate natural system”.<sup>25</sup> Estimates suggest that a circular economy path to development in India in the sectors of cities and construction, food and agriculture, and mobility and vehicle manufacturing could result in annual benefits of US\$ 218 billion in 2030 and US\$ 624 billion in 2050, compared to the current path.<sup>26</sup> The approach would also help reduce GHG emissions by 23% in 2030 and 44% in 2050, and negative externalities related to pollution and congestion would also be significantly lower.<sup>26</sup>

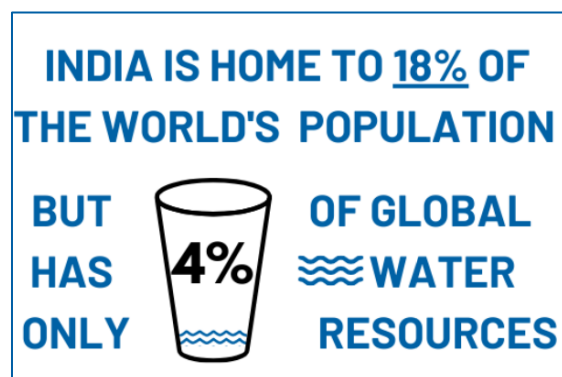
A sector where the circular economy concept has gained prominence in application is the textile and apparel industry. India is home to one of the largest textiles and apparel industries, which employ over 45 million people.<sup>27</sup> The sector is also the third biggest source of municipal solid waste and is water-intensive in its production.<sup>28</sup> Waste is generated at every step of the supply chain, from raw materials to retail, in addition to excessive consumer consumption. Globally, two thirds of all clothing end up in landfills within a year of being made.<sup>29</sup>

With material consumption expected to triple by 2025,<sup>30</sup> recycling and upcycling is required to manage waste production. Recycling rates in India are well below international benchmarks of

around 90% set by Scandinavian countries. In India only 27% of packaging paper, 60% of plastics and 20-25% of metals are recycled.<sup>30</sup> The recycling sector is of social and environmental value in resources saved and job creation; however, it can reinforce discriminatory societal structures and also exacerbate indecent working conditions.<sup>31</sup> Nonetheless, studies show that the recycling sector has the potential to create 6-8 times more jobs than land filling and incineration of waste, if regulated appropriately.<sup>30</sup>

## Water and Sanitation

India is home to 18% of the world's population but possesses only about 4% of global water resources.<sup>32</sup> Its growing population and economy put pressure on water resources, which are at the same time increasingly impacted by climate change. According to a Water Aid report, as many as 163 million Indians don't have access to clean



water close to their home.<sup>33</sup> The country already faces issues with depleting groundwater levels, heavy demand from industry and agriculture, and poor water management. Several Indian cities are on the short list of localities that could go dry in the next few years.<sup>34</sup>

On the other hand, significant advances have been made to improve the sanitation situation in the country. In 2015, nearly 568 million people in India lacked access to toilets; however by 2019, estimates indicate that the number has reduced by 450 million people primarily due to the Swachh Bharat Mission, which aimed to eliminate open defecation and improve solid waste management.<sup>35</sup> However, a significant section of India's population still practices open defecation, with many continuing to lack access to improved sanitation. Human excreta is a significant source of GHG emissions, with pit latrines estimated to account for 1% of global anthropogenic methane emissions,<sup>36</sup> and methane being a far more potent greenhouse gas than CO<sub>2</sub>. There is also

considerable potential to reduce energy usage in sewer conveyance and recover energy from waste and wastewater.

## MARKET OVERVIEW: WHAT IS THE OPPORTUNITY FOR SGBS?

### SGBs and Renewable Energy

Only 90 GW of the country's planned 450 GW total renewable energy (RE) potential of the country has been tapped, leaving a huge gap between the potential and installed capacity.<sup>37</sup> All forms of renewable energy (wind, small-hydro, solar, biomass through co-generation with bagasse, and waste to energy) have significant potential in India.

The energy transition presents a vast range of opportunities for SGBs, ranging from technologies necessary for integration of renewables into the grid (scheduling, forecasting, demand-side management, smart meters, etc.), energy storage which is critical to move away from coal, waste-to-energy, and energy efficiency.

With respect to the DRE market, experts suggest that the investment potential could be as high as US\$ 100 billion.<sup>38</sup> Solutions in the market can be deployed across various fields, including for residential, agricultural, and enterprise use. While DRE solutions started out being tuned towards meeting basic lighting needs, the scope in the country has expanded to include fulfilling broader energy requirements. Innovations with respect to DRE have transformed rural India through electricity access and by creating livelihoods.

A survey on DRE jobs by Power for All and the Council on Energy, Environment and Water reported that 95,000 direct formal jobs and around 210,000 informal jobs were created in India in 2017-18.<sup>39</sup> However, women's participation in the sector remains low. For example, Indian women make up about 11% of the rooftop solar sector's workforce, compared to 32% globally.<sup>40</sup>

## ENERGY TRANSITION PRESENTS OPPORTUNITIES FOR SGBS ACROSS



Technology for integration into grid



Waste-to-energy



Energy storage (critical to move away from coal)



Increasing energy efficiency

While government initiatives have contributed to achieving near universal electrification of villages in India, there is still a gap in electrification of individual households, quality, and uninterrupted supply, which SGBs can address. There is potential for SGBs to innovate with livelihoods-based offerings, including with respect to solar pumps for irrigation, solar refrigerators, solar sewing machines, and clean cooking applications, as identified by Clean Energy Access Network (CLEAN) members.<sup>15</sup>

The Micro, Small and Medium Enterprises (MSME) sector, which accounts for 90% of India's industrial units, can also have a significant impact on lowering pollution by adopting energy efficient solutions.<sup>41</sup> While there is a lack of comprehensive data on energy consumption for this sector as a whole, a survey in a recent report indicated that only 35% of MSMEs had conducted an energy audit in the three years prior to the survey, and less than one-fifth of enterprises had participated in energy efficiency workshops, representing a significant untapped opportunity.<sup>42</sup>

## SGBs and Mobility

Mobility needs among the Indian population are ever-changing, during a pandemic and in "normal" times. With the government's commitment through policy to clean mobility, the electric vehicle (EV) conversation has gained great momentum in the country.

This provides an opportunity for SGBs to innovate – from electric scooters and motorcycles, sharing platforms, charging infrastructure, to logistical services, startups are beginning to disrupt

the status quo of the automotive sector. Companies like Yulu, BattRE, and Ather Energy are examples of mobility startups driving innovations in the EV market.

In August 2020, the Ministry of Road Transport and Highways issued a statement that two- and three- wheeler EVs could be sold without a pre-fitted battery pack. This policy allows sellers to bring down the upfront cost of the vehicle and opens a new market for 'battery-as-a-service' for SGBs to enter.<sup>43</sup>

Electric mobility, the role of fleet vehicles, and last mile connectivity for passengers and delivery are creating opportunities for SGBs – both in terms of vehicle production (design, components and full vehicles) as well as in supporting infrastructure like batteries, charging, and fleet management.

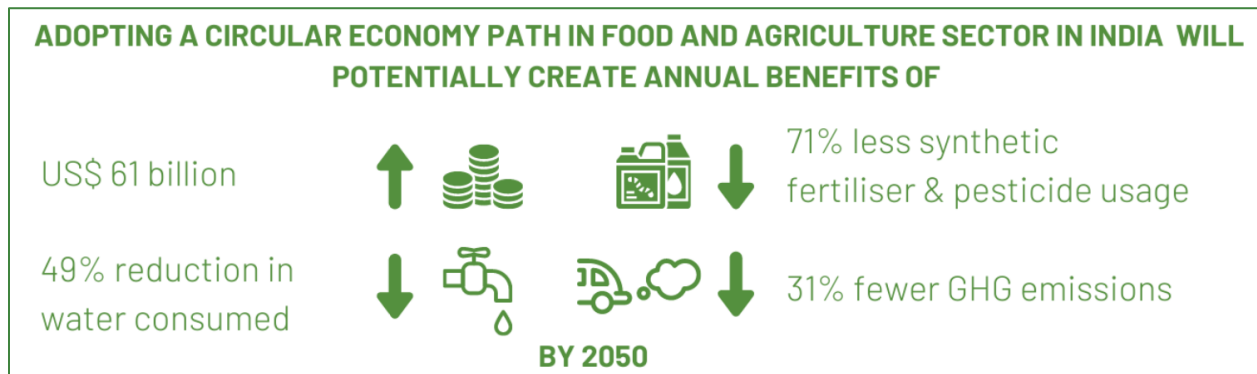
## **SGBs and Circular Economy**

### *AGRICULTURE*

Adopting a circular economy path in the food and agriculture sector in India presents the possibility of creating annual benefits of US\$ 61 billion, 31% fewer GHG emissions, 71% less synthetic fertiliser and pesticide usage, and a 49% reduction in water consumed by 2050.<sup>26</sup> As the country's leading employer, the agriculture sector is a major area where employing a circular economy approach would pay huge dividends, especially with an agricultural approach that is regenerative. Ways in which the dependence on water and synthetic chemicals could be reduced include creating large scale networks amongst small scale farm holdings to connect and align them on regenerative practices; and leveraging technology in combination with traditional knowledge such as precision farming and asset and knowledge sharing systems. Resource efficiency can also be improved, given India's high fertiliser intensity usage and burning of crops contributing to further depletion of soil quality.<sup>44</sup>

Reducing food waste—currently about 40% of food produced in India—presents another major

area of opportunity.<sup>45</sup> Food waste in the country is seen throughout the value chain and not just primarily in the customer and post-customer stages.<sup>44</sup>



These gaps in the sector provide opportunities for SGBs to address these issues, especially with technology-driven solutions. Growing at a 25% year-on-year rate, India was already home to more than 450 startups in the agri-tech sector.<sup>46</sup> An example of a startup that has innovated to change the status quo is Krimanshi, which utilises surplus agricultural and food waste to create low-cost nutritious cattle fodder, resulting in minimal loss of nutrients, and produced at half the conventional cost.<sup>47</sup>

## TEXTILES

The textile sector is a significant sector for the country in terms of employment, output, and exports. Unfortunately, it is also one of the most polluting and water intensive sectors. While the reuse and recycling ethos was present in the country earlier, the advent of fast fashion has created adverse environmental and social impacts. The fashion industry is valued at over US\$2 trillion, and although it is a major contributor to the world economy, the supply chains involved account for over 10% of global carbon emissions.<sup>48,49</sup>

Applying circular economy principles to this sector is a necessity in India's and the world's quest for a cleaner and greener way of life.<sup>25</sup> There is a shift towards more sustainable approaches, and major corporations across the world are committing to doing better. Beyond the urgent need to

move towards a more sustainable lifestyle, there also exists high market potential for waste management and upcycling in the textile value chain. This provides an opportunity for SGBs, as these companies are looking to entrepreneurs for new technologies and practices to managing waste generated at each step—from raw materials to weaving and consumer waste.

Experts in the space have identified that collaborations between corporations and entrepreneurs on the circularity agenda is essential for impact. In this regard, India has the opportunity to become a hotbed for circular startups, adding more players to existing ones like Khaloom, Boheco, Trustrace, Lionise and Kiabza.<sup>50</sup>

### *WASTE TO VALUE*

India generates the most waste of any country—over a tenth of the world’s total waste.<sup>23</sup> Significant focus must be placed on developing consumer mindsets to be more sustainable, but that sort of systemic change is time consuming. Business solutions that curb wastage in production and help fix the damage that has already been done are needed. While the role of the public sector is crucial, there is an opportunity for SGBs to develop solutions to address this mounting problem. Broadly speaking, India’s waste management market size is estimated to be worth US\$ 15 billion by 2025.<sup>51</sup>

The reduce-reuse-recycle ethos needs to be incorporated to safeguard the environment. Recycling also makes economic sense, since existing resources use less energy than new materials, and by using the inputs or energy already existing in current waste, further pollution can be reduced. There is strong job creation potential from recycling, even at higher income levels – recycling 10,000 tons of waste can create six times as many jobs compared to dumping the same amount in a landfill.<sup>52</sup> An extension of this ethos is also the need for SGBs to ‘replace’ harmful materials currently used in the manufacturing process that are beyond reusing/recycling.





Additionally, the agriculture sector also provides an opportunity to create value from waste, with examples like biogas production, converting crop residues to briquettes and utilising agricultural waste as packing or construction material. Plastic waste to value is another area where there is tremendous potential for SGBs to bring about change. India generates around 26,000 tonnes of plastics from urban areas daily, which on an average account for about 7% of municipal solid waste.<sup>53</sup>

## **SGBs and Water and Sanitation**

Groundwater levels are falling, and chronic water scarcity is being recorded more frequently across cities, towns and villages in India. With 18% of the world's population, India has only 4% of water resources.<sup>32</sup> Matters are expected to become worse, and a greater water crisis is expected by 2050, with portions of central India potentially facing 40% withdrawal of renewable surface water resources.<sup>54</sup> The country urgently requires solutions targeted at water conservation, and SGBs can play a vital role here as well.

The Toilet Board Coalition estimates that the size of the sanitation economy in India will be valued at US\$ 62 billion annually by 2021.<sup>55</sup> This promising market is spurring a wave of 'sanipreneurs' searching for innovative ways to turn human waste into usable resources, like renewable energy. Examples include Garv Toilets, which manufactures stainless-steel toilets that are powered by solar

panels and equipped with bio-digester tanks, and Tiger Toilets, which use tiger worms to break down human waste and convert it into potable water and fertiliser.

Although the sector is nascent, there exists potential for a shift from traditional grant-like investments to those of a more commercial nature, given the size of the sector and the fact that this demand is recession-proof.

Eighty percent of water in India is used by the agriculture sector.<sup>56</sup> The vast majority of the agriculture sector still uses flood irrigation, a system that is neither optimal for water nor the plants. Precision irrigation, appropriate cropping patterns, and borewell recharge present opportunities to save considerable amounts of water. Rainwater harvesting is another solution to save potable water, though its applicability extends beyond agriculture to the residential sector.

Some of the greatest polluters of water in India are industry and residential complexes. Both are guilty of not treating their wastewater properly, resulting in contaminants and raw sewage ending up in the water. Wastewater treatment is a great opportunity for SGBs, especially with new regulations that are starting to require and enforce it in water-scarce markets like Bangalore.

## EXISTING POLICY INFRASTRUCTURE

### Renewable Energy

India has committed to ensuring that 40% of its installed capacity is comprised of renewable energy solutions by 2030. In 2019, the government announced a target of installing 175 GW of renewable energy capacity by 2022, with the Prime Minister adding that the system would eventually include 450 GW. Additionally, the Ministry of Finance established a Climate Change Finance Unit within the Department of Economic Affairs to serve as the nodal office for all climate change financing matters in the country.<sup>57</sup> Effective system integration of these targets will require flexible policies and different pools of finance. The Indian government has formulated over a

hundred policy interventions that help support SGBs and aim to catalyse the clean energy sector in the country.

A majority of the work to boost this sector is occurring at the state level, although most policymaking is still predominantly centralised. An analysis of policy support for renewable energy indicates that most legislation is focused on funding technology pilots of DRE innovations. As mentioned, policies do exist to encourage the adoption and manufacturing of EV vehicles, such as the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India. The government also allows for subsidies in the purchase of vehicles that use clean energy.

While these provide short-term opportunities for SGBs, long-term support for research and development (R&D) and innovations seem to be lacking. There also exists a lack of end-user finance options which allow rural communities to benefit from these innovations. A visible lack of incentives and support-mechanisms may hinder entrepreneurs from innovating to help solve pressing issues in this sector.

## **Circular Economy**

A report released by Federation of Indian Chambers of Commerce & Industry in 2018 stated that close to half a trillion dollars in economic value can be unlocked by a transition to a circular economy.<sup>44</sup> For an economy that was growing pre-COVID, and one which is expected to be back on a growth trajectory in the coming year, this implies that such growth will be accompanied with an increasing demand for resources.

Through bilateral cooperation with Germany, the Government of India established an Indian Resource Panel in 2015, functioning as an advisory body under the Ministry of Environment, Forest and Climate Change. The main mandate of this panel is to research and analyse resource-related issues facing the country and devise an appropriate strategy to increase efficient usage. Additionally, the Zero Defect, Zero Effect scheme by the government will focus on MSMEs and

small businesses with the aim of bringing about a culture where production mechanisms have zero defects and implement processes that have no adverse environmental effects.

In addition to these macro-oriented policies, the government has also implemented sector-specific regulations such as the Plastic Waste Management Rules and Amendment, Extended Producer Responsibility, E-Waste Management Rules, and Metals Recycling Policy that seek to spur innovations.

The British Standards Institutions group has also published BS8001, the world's first framework for organisations to implement principles related to circular economy. A policy that allows bio-CNG (a renewable form of energy produced from agricultural and food waste) to be fed into the national gas grid is expected soon. This could potentially be a game changer for waste-to-value companies that produce biogas from agriculture or municipal organic waste.

## **Water and Sanitation**

Possibly the most notable policy in this sector is the Swachh Bharat Abhiyan, launched in 2014 with the aim of providing the Indian population universal access to toilets. This clear push from the central and state governments has increased awareness around the need for developed sanitation systems and paved the way for innovators and entrepreneurs to enter the sector. In addition, "More crop per drop" is a slogan-driven government initiative to conserve water used in agriculture, established in 2006, and comes with policy initiatives such as Pradhan Mantri Krishi Sinchayee Yojana.<sup>58</sup>

# **EXISTING ACCESS TO FINANCE AND ECOSYSTEM SUPPORT OPPORTUNITIES**

Most of the intermediaries in the environment and climate action segment support SGBs only when the idea has evolved past a certain stage, and there already exists a proof of concept. Initial

incubation support providing infrastructure for R&D is lacking, and few debt institutions and non-banking financial companies (NBFC) are looking to finance the clean energy sector.<sup>59</sup> Similarly, although clean energy comes across as a focus for banks, the focus does not translate to greater access to capital for startups in this space. As conventional investors continue to be balance-sheet and collateral-driven, there emerges a clear lack of risk capital that hinders innovation in the sector.

There are, however, major fast-moving consumer goods players that have set up funds to help support startups focusing on sustainability. Procter and Gamble's Rs 200 crore environment sustainability fund is one such example. However, only 7% of philanthropic funding in the country is focused explicitly on climate, and mostly concentrated in agriculture and related sectors.<sup>60</sup> This also stems from the fact that many funders and investors have historically viewed climate as a government or industry problem and have been hesitant to deploy more private money. In the recent past, although significant strides have been made in solar and wind energy sectors, as well as in helping increase the capacity of renewables annually, India still needs US\$ 100 billion in additional climate finance every year for the next decade to combat the effects of climate change by 2030.<sup>61</sup>

There is a significant need to restructure policy and regulations to direct capital towards 'green SGBs'. As India works on ways to meet its Nationally Determined Contributions (NDCs) under the Paris Agreement, this restructuring becomes particularly important. The aftermath of the pandemic provides an opportunity for a 'green' recovery, an improved way of doing business. The Rockefeller Foundation is an example of an organisation that has just committed US\$1 billion towards an inclusive and green recovery.<sup>62</sup>

The past few years have also seen the development of networks and collectives that are looking to tackle this massive issue with a collaborative lens. The India Climate Collaborative is one such India-focused collaborative that looks to shine the spotlight on India's climate action and direct

funding towards organisations working to design solutions for the same. Green Artha Innovations is focused on facilitating virtuous cycles between capital and growth for climate-focussed SGBs. To support its efforts, the company leverages and collaborates with several networks, including ANDE. It hosts the Cleantech Women's Innovation Network and is also involved in the process of building out the Climate Capital Network.

## SUPPORTING AND SCALING CLEANTECH-FOCUSSED SGBS

Cleantech focused startups fail in raising capital to reconcile the business model of operations with a technically proven innovation. This is because most R&D support is available to produce prototypes and scalable private funding only comes in when there's a tested business growth appetite and opportunity. Government initiatives currently focus on large-scale tried-and-tested mature market models, criteria that become highly unlikely for early-stage SGBs to meet. There are very few incubator/accelerator programs currently available that provide support to clean energy focused startups in India.

## STRATEGIES LOOKING FORWARD

### Capacity Development

Intermediaries must collaboratively work to collect and showcase data from across their portfolio organisations and networks. Highlighting these cases will provide data, both quantitative in terms of previous investments, grants, etc. as well as qualitative in terms of type of capacity development support received thus far, which will help in directing more evidence-based funding and support towards entrepreneurs. This transparency of data will also ensure a wider pool of entrepreneurs from across the country is reached, and the access to support is not limited to a selected few based in urban regions who might go through multiple support programs. This will also help in ensuring the quality of entrepreneur support as information is shared and each program offers upskilling opportunities.

There also exists a significant need for to interact with industry and/or rural experts as well as customers to develop commercialisation and demonstration models that move beyond repetitive pilots, while also ensuring mentorship stays specific and relevant.

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**Incubators must collaborate so that they do not end up serving the same group of entrepreneurs. Youngsters should not be going from one incubator to the other. Collaboration will create transparency and also help develop the right kind of mentorship based on the entrepreneur's context.**

**Harish Hande  
CEO, SELCO Foundation**



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An example is the Circular Apparel Innovation Factory, an initiative by Intellectap, which has mapped solutions from more than three hundred innovative SGBs, from alternative and sustainable fiber, yarns, and processing inputs and processes to new consumer-facing business and retail models.<sup>63</sup> Collaborative platforms such as these are powerful resources to aggregate and showcase innovations in the industry to help direct more funding and support to these players. Additionally, organisations like Enviu have been working with a systemic lens towards closing the loop of waste generation by creating and supporting enterprises that span different nodal points of the entire textile supply chain.<sup>64</sup>

One of the gaps that emerged through a review on entrepreneur support programs was the lack of a gender lens.<sup>65</sup> Women entrepreneurs are not participating in capacity-development programs at the same rate as men, and additionally, these programs are not as easily accessible to women, further increasing the gap. Seeing more women taking up and continuing in STEM fields will help develop a pipeline of women entrepreneurs, but this will take time. However, there are shorter-

term recommendations that can be implemented, ranging from entrepreneur sourcing and recruitment to later-stage venture support and broader ecosystem-focused interventions

Capacity development providers also need to help entrepreneurs navigate the complex and intertwined government infrastructure of policies and schemes available to them. One instrumental step here would be mapping of the stakeholders present in the system, across the sectors highlighted above. This ecosystem snapshot would help relevant stakeholders get a view into the existing players in the field, build more collaborative solutions towards greater impact, and address gaps in the entrepreneurial ecosystem for local SGB entrepreneurs.

As discussed previously, facilities to support innovations with adequate R&D infrastructure are still minimal in the Indian context. Government organisations such as Biotechnology Industry Research Assistance Council (BIRAC) have helped establish facilities that nascent entrepreneurs in biotechnology-related fields can leverage to build solutions. A key collaborative effort could be advocating to establish similar infrastructure and programmatic support to catalyse innovations in the environment field as well. There also exists opportunity within the mandate of the Atal Innovation Mission to emphasise on these sectors related to environment and climate action.

## **Access to Finance**

Climate action cannot solely be construed as the government's responsibility. The needs in this sector are greater than what the public sector can fund. Investment into the sector is largely deployed either in late stage proven technologies such as wind, solar and increasingly EVs or in very early stage companies via grants and incubation or acceleration support. There is insufficient funding directed towards businesses that need the capital to de-risk and become scalable and commercially viable.

Early-stage risk capital continues to be inaccessible to innovators and entrepreneurs coming up



with solutions pertaining to environmental action and addressing climate change. Venture capital models, as widely practiced, are not the ideal solution for climate innovations which offer a different development cycle, market structure and risk reward profile.

Grants serve an extremely valuable purpose in the market, funding the vast majority of the early stage companies and the incubation and acceleration programs that support early stage company development. Grants, however, are only meant to cover R&D, market development and pilots. Further, because grants are non-repatriable capital, they create a limit on available capital, and by nature remain of small size. In addition to grants, 'friends and family' capital is what many founders lean on in their initial stages, if they have access to the networks. For women entrepreneurs and other entrepreneurs from more marginalised contexts, these types of networks may be inaccessible and hence require greater external funding support.<sup>66</sup>

The combination of limited grant funding and risk capital limits the ability for businesses to plan for the future. Lack of line of sight to the capital needed to build a business, therefore prevents entrepreneurs from building the teams needed to build faster, better and cheaper solutions. This fault in the market essentially keeps large problems, and by extension large scalable solutions, capital deficient. Therefore, these problems not only remain capital deficient, but also talent deficient.

Debt funding is increasingly available in the sector with a number of organisations (Caspian, Yunus Social Business, Tata Cleantech, Ckers, Samunnati, Shell Foundation, GreenFunder, NABARD and programmes via State Bank of India and Punjab National Bank) operating in the space and providing a full range of products from venture debt and working capital to asset finance, invoice discounting and project finance. As an instrument, debt is available to companies that can demonstrate assets, cashflows or contracts that would guarantee repayment. Another challenge noted by providers of debt, is that equity is generally required to cover a percentage of the

proposed use. Certain lenders have identified the dearth of equity funding in the market as a significant business challenge.

A recent report by the CLEAN network highlighted that the overall rate of successful financing attempts of entities in the DRE space stands at 39%.<sup>67</sup> This includes grants, debt, equity among other sources and indicates the incompatibility of existing financing structures for companies in the sector.

In addition to the existing problem of funding, the pandemic has also severely affected the pipeline of more funds coming into the sector. Blended finance options such as impact bonds, social success notes<sup>68</sup> and other pay-for-success tools can be leveraged as instruments that can help catalyse more funding, both philanthropic and private, towards financing innovative projects that have the ability to scale.

Private investors, to date untapped, have a significant role to play to catalyse the way climate-related finance is utilised for innovation. While investments in this area are on the rise, this growth is not sufficient to meet our climate goals. This requires an ecosystem-wide effort to bring more investors into the sector and development of the right support mechanisms to develop and deploy appropriate financial instruments and structures.

Initiatives to bring more money into the sector are also extremely important. The recent launch of Climate Angels, by GoMassive Earth Network, an early-stage investment syndication platform for pollution reduction and climate tech, is one such attempt.<sup>69</sup> The ACT Fund, an initiative formed by leading venture capitalists and successful entrepreneurs, is channeling its successes in COVID response to drive successes in climate action, specifically water and air, through ACT Environment. Rainmatter Climate Foundation is evaluating opportunities to enable retail investors to participate in the green economy through investments in digital green assets.<sup>70</sup>

The Climate Capital Network (CCN) started by Green Artha is an initiative to catalyse funding into the sector by bringing together investors from across the capital spectrum (grants, equity, debt, social success notes and other special purpose vehicles) across climate and climate adjacent sectors and across funder types (philanthropists, funds, NBFCs, banks and corporate investors) to demonstrate a continuum of capital, facilitate investment partnerships, enable shared diligence and learnings, as well as support blended capital and other new investment mechanisms.

Another possible intervention is the providing of more end-user finance, which is distinct from finance provided to enterprises, but at the same time, highly complementary. These interventions will allow rural communities to afford, and transition, to solutions provided by SGBs in the space and also enable the SGBs to grow on the basis of customer traction and revenue rather than equity dilution/ debt.

An example of a collaborative funding effort is the Powering Livelihoods initiative. A US\$ 3 million initiative co-conceptualised by Villgro Innovations Foundation and Council on Energy, Environment and Water (CEEW) aims to catalyse India's rural economy by providing capital and technical support to social enterprises deploying clean energy-powered livelihood appliances to enable large-scale commercial deployments.

## **Policy Advocacy**

As is evident from the myriad of topics and actors within the policy and regulatory ecosystem, this is truly a complex space. There are numerous ministries and nodal agencies that are involved in the climate change and environment ecosystem, specifically as relevant to the SGB sector.

A systems map of all the various ministries, along with policy analysis of the existing rules and regulations and support infrastructure offered by the central and state government, will be a

pivotal first step to helping an entrepreneur, or a stakeholder looking to support entrepreneurs, make sense of this space.

The government is the largest purchaser of goods and services in this sector. Easing business-to-government business regulations is an area where significant change is required, lest the market be dictated by large incumbents. In addition, policy influencers must advocate for the alignment of state and central interventions, and help create a push towards a more conducive ecosystem for an increasing number of players to show interest in entering the space

## **Corporate Engagement**

As major corporates the world over seek to make their value chains more sustainable, there is a pivotal opportunity for entrepreneurial ecosystem actors to work with these influential stakeholders and bring about changes both at the operational and systemic level. A number of factors influence motivations for Indian businesses to adopt environmentally friendly practices, such as investors seeking responsible business practices as a mandatory clause, development of a conducive legislative landscape, and a company's internal cost and resource efficiency.

Entrepreneurial support organisations should work with portfolios of enterprises in this value chain to help build leadership commitment and develop internal policies and resource allocation protocols that highlight the importance of environmental sustainability.

Working with larger corporates to map their suppliers and monitor practices by setting sustainability goals and targets will help provide a clear roadmap for greater impact, especially when identifying the role of SGBs in their value chains.

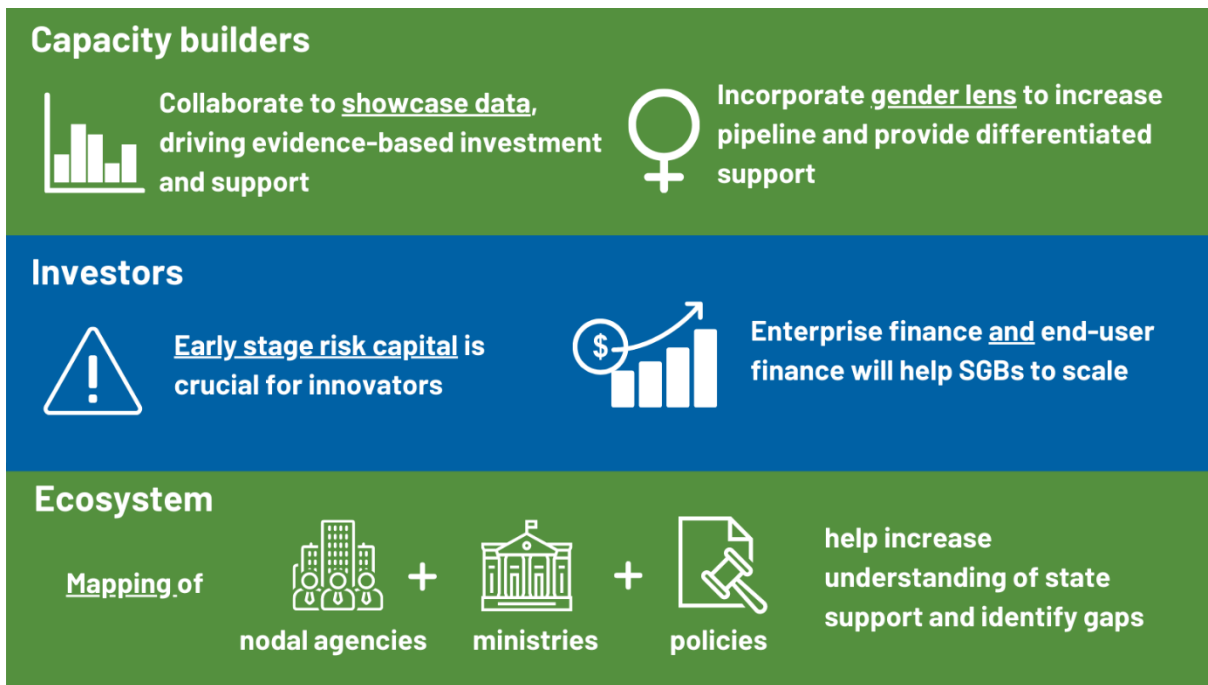
## **Impact Measurement and Management**

As businesses and governments the world over tackle climate change, there also arises the challenge of being able to measure the impact of decisions made, both positive and negative.

Current metrics include carbon pricing and CO<sub>2</sub> abatement curves, but as the sector moves towards supporting and funding SGBs, there will be the need to define metrics that can help measure and track the impact of innovations.

A lot has been written about climate change migration and how vulnerable and marginalised communities are severely affected by climate change issues like rising water levels and air pollution. However, are there metrics that can help us quantitatively measure this detrimental impact or measure the impact of environment related SGBs, beyond the number of consumers reached? Being able to quantify to some extent will help businesses and entrepreneurs identify and compare strategies and investment choices by evaluating the ones that can lead to greater impact.

# KEY TAKEAWAYS



- Beyond the need to transition to greener methods for sustainability reasons, there exists tremendous market potential for SGBs to innovate across renewable energy, circularity, and water and sanitation in India.
- Entrepreneur support organisations must collaboratively support innovations at the idea stage with adequate R&D, complementing government policy efforts. Incorporation of a gender lens towards program design is also key to build a greater pipeline of entrepreneurs in the field.
- Entrepreneur support organisations must also collaboratively work to collect and showcase data from the entrepreneurs to support evidence-based investments and further support and capacity development.

- Early-stage risk capital continues to be inaccessible to innovators and entrepreneurs coming up with solutions pertaining to environmental action and addressing climate change.
- Increased and innovative enterprise finance and end-user finance will be needed to support scaling and adoption of innovative solutions.
- Mapping of various nodal agencies and ministries along with policy mapping impacting the sector will help in identifying gaps and provide a comprehensive understanding of state support to investors and entrepreneurs alike.

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<sup>1</sup> Small and Growing Businesses (SGBs) are defined by ANDE as commercially viable businesses with five to 250 employees that have significant potential, and ambition, for growth. Typically, SGBs seek growth capital from \$20,000 to \$2 million.

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