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# Skills for Green Jobs in India





# Skills for Green Jobs in **India**

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## Abbreviations and acronyms

|                  |  |
|------------------|--|
| <b>CSD</b>       | Centre for Sustainable Development                           |
| <b>CSR</b>       | Corporate Social Responsibility                              |
| <b>NGO</b>       | Non-Government Organisation                                  |
| <b>SCGJ</b>      | Skill Council for green jobs                                 |
| <b>MoLE</b>      | Ministry of Labour and employment                            |
| <b>MoRD</b>      | Ministry of rural Development                                |
| <b>IREDA</b>     | Indian Renewable Energy Developemnt agenvy                   |
| <b>NAPCC</b>     | National Action plan on Climate Change                       |
| <b>NDC</b>       | Nationally determined contributions                          |
| <b>SDG</b>       | Sustainable Developemnt Goals                                |
| <b>DAY –NULM</b> | Deendayal antyodaya yojana National Urban Livelihood Mission |
| <b>DDY_GKY</b>   | Deen Deyal Upadhyaya Gramin Kaushal Yojana                   |
| <b>IL&amp;FS</b> | Infrastructure Leasing & Financial Services                  |
| <b>ITI</b>       | Industrial Training Institute                                |
| <b>ATI</b>       | Advanced Training Institute                                  |
| <b>PMKVY</b>     | Pradhan Mantri Kaushal Vikas Yojana                          |
| <b>MSDE</b>      | Ministry of Skill Development and Entrepreneurship           |
| <b>NSDA</b>      | National Skill Development Agency                            |
| <b>NSDC</b>      | National Skill Development Council                           |
| <b>SMART</b>     | Skill Management and Accreditation of Training Centres       |
| <b>MGNREGA</b>   | Mahatma Gandhi National Rural Employment Guarantee Act       |
| <b>SSC</b>       | Sector Skill Council   |

## Abstract

Over a few years green economy and green jobs have attracted policy-makers and been discussed extensively in the political arena. Green jobs translate the economy into sustainable growth by providing dynamic opportunities to reconstruct the job base and new investment. Developed and developing countries are dedicated to achieving low carbon emissions to mitigate pressure caused by current and future high emissions levels. Accordingly funding is being diverted in such a way as to give rise to a gradual shift from brown jobs to green jobs. The focus of green jobs is expansion of green transformation and exploitation of energy efficiency and renewable energy potential that requires transformation of the skills base. The transformation in skills development responses needs to focus on adding to existing competencies with emphasis on core skills for stimulating employer demand for low-carbon skills and accelerating the growth of low-carbon industries and supply chains. For example, the government of India initiated a flagship programme “Skill India” which is oriented to training of the labour force to meet the requirements of a green economy. Therefore the aim of the study is to identify gaps in existing knowledge in different environment-related sectors which are suffering shortages of supply of technical specialists, designers, engineers, and electricians due to the low skills levels of workers. There is a requirement for consulting skills, communication skills, and the filling of skills gaps among project managers with a view to delivering a range of mitigation and adaptation solutions. The major challenges and priorities should generate a green jobs environment in India. The present report attempts to link climate adaptation and resilience to emerging development processes in the Indian economy with existing mitigation initiatives, and is a follow-up to an earlier report (2010) on Skills for Green Jobs in India.

## Acknowledgment

This study was conducted by Dr Vipin Kumar, Dr Naresh Kumar, Dr Kasturi Mandal, Mr Arpit Choudhary in the National Institute of Science Technology and Development Studies (NISTADS), as a part of set of national studies on skills for green jobs conducted in some thirty countries globally. The set of studies is the result of collaboration between the ILO and the European Centre for the Development of Vocational Training (Cedefop). Overall methodological guidance was provided by Olga Strietska-Illina (ILO Employment Policy Department, Skills and Employability Branch). Coordination of country studies and technical backstopping was provided by a team led by Catherine Saget (ILO Research Department), Tahmina Mahmud (ILO Skills and Employability Branch) and Takaaki Kizu (ILO Research Department). Moustapha Kamal Gueye and Marek Harsdorff (ILO Enterprises Department) contributed to the studies' implementation on behalf of the ILO Green Jobs Programme. Alena Zukersteinova and Stelina Chatzichristou from Cedefop's Department for Skills and Labour Market coordinated studies among the participating EU countries. Valuable inputs were provided by the ILO colleagues: Christine Hoffmann, Laura Brewer, Maria Ilca Lima Webster, Alvaro Ramirez Bogantes, Hassan Ndahi, Fernando Vargas Zuñiga, Patrick Daru, Akiko Sakamoto, Mikhail Pouchkin, Gabriel Bordado, Julien Magnat, Kanae Tada, Tendy Gunawan, Bolotbek Orokov, Gwyneth Anne Palmos, Georginia Pascual, Badiane Cheickh and Kishore Kumar Singh. Massimiliano Leone, Ana Buzdugan (International Training Centre ILO Turin), Mariela Dyrberg and Annette Brandstätter (ILO Employment Policy Department) Solveig Boyer (ILO Green Jobs Programme) and Manuela Flamini (Edizioni Retrò s.r.l.) were responsible for editing and design.

# 1. Introduction (objectives, methods used)

## 1.1 Greening the Indian economy

With an ecological footprint double its bio-capacity it is imperative for a country like India to be able to sustain the well-being of its people and natural capital. Hence the current need to bring about economic reforms that steer India in the direction of a green economy. The transition to green and inclusive economies has been long deliberated and initiated at both national and global levels; however, the current domestic and international landscape has created an opportune moment to accelerate it. India has recently made two major global commitments: the 2030 Global Development Agenda (popularly known as the Sustainable Development Goals) and ratification of the Paris Agreement which aims for the holistic well-being of all, today and in the future, without surpassing the natural boundary limits of the environment. India has also made some landmark changes to its approach of development. Some of these include fiscal federalism, and a move from a five-year planning model to a fifteen-year development planning model at national level. In this era of reflections, promises and commitments relating to sustainable development and climate change, the green economy concept is an exciting approach that interlinks economic growth with human development and environmental sustainability.

## 1.2 Current scenario

In 2016 India ranked a very low 68 out of 80 countries in terms of performance ranking as analysed in the Global Green Economy Index (GGEI), a data-driven analysis of national green economy performance. India ranked amongst the lowest in the Environment Dimension and Leadership and Climate Change and Efficiency Sectors dimensions. It however performed well in

the Markets and Investment dimension, coming close to being in the top twenty.

Interestingly, India achieved a relatively high perception rank of 19 (citizens' assessment of their countries performance) for the Sustainable Development Goals (SDGs). However it ranked a low 110 out of 149 nations assessed on where they stand with regard to achieving the SDGs. While this indicates that India has a long journey ahead, it is off to a good start. The general perception is that SDGs offer a huge opportunity to achieve holistic development in the country and they are increasingly gaining momentum. At the national level nodal ministries have been assigned to each of the 17 goals and several rounds of multi-stakeholder consultations have taken place. The Ministry of Statistics and Programme Implementation has identified relevant indicators for expediting the programmes on a priority basis. A Committee of Parliamentarians has also been formed to raise awareness of the SDGs among legislators.

At State level, some States have started preparing their Vision 2030 documents and adopted voluntary initiatives to integrate SDGs into their development programmes. Sikkim, a progressive State, is currently working towards passing a Sustainable Development Act through which it can mandate State departments to track their progress on SDGs.

## 1.3 Government initiatives

India's 12<sup>th</sup> Five-Year plan (2012-17) for the first time made environmental sustainability a central pillar of India's development strategy. Thenceforth India has restructured its Plans and will instead develop a long term 15-Year Plan for systematic inclusive development and poverty reduction which coincides with the period for achieving the SDGs. The Government has also set up the Indian Renewable Energy Development

Agency (IREDA) as a public sector unit for market development and financing. The Bureau of Energy Efficiency (BEE) was set up to encourage awareness and demand creation for energy-efficient products, goods and services. The BEE set up the Energy Efficiency Financing Platform (EEFP) to support cost-effective financing of energy-efficient project implementation and its expansion. In the 2010–11 Union Budget the Government announced the setting-up of the National Clean Energy Fund (NCEF) for funding research and innovative projects on clean technologies. The Central Electricity Regulatory Commission (CERC) has announced Renewable Energy Certificate (REC) norms in a bid to promote power generation from clean sources in the country.

Some other key initiatives taken by the government are as follows:

- ▶ Green Bonds are gaining popularity as an innovative mechanism for raising capital, attracting foreign investment and inducing momentum in the market. Green bond issuance in the country witnessed a 30 per cent year-on-year increase in 2016, cumulatively amounting to about 180 billion Indian Rupees and making India the seventh largest green bond market globally. In 2016 Hero Future Energies issued Climate-Bonds-certified green bonds worth 3 billion Rupees.
- ▶ Social Impact Investment in India has made significant strides in the past six years, with over USD 4.1 billion worth of investments yielding strong returns. The pace of investment is growing at 15 per cent annually and is expected to reach US\$ 6-8 billion by 2025.
- ▶ Since 2008 at least four sustainability indices have been introduced in India to guide responsible investment. In 2012 the Bombay Stock Exchange introduced two such indices: S&P BSE Greenex, and S&P BSE Carbonex. Investments using these indices achieve higher returns in two out of three cases.
- ▶ India is the first country in the world to legally mandate two per cent Corporate Social Responsibility (CSR) spending for companies with a net profit of 50 million Rupees or more, a net worth of five billion Rupees or more, or

a turnover of 50 billion Rupees or more in any financial year. Indian companies spent over 250 billion Rupees on CSR in 2015.

- ▶ A World Bank report estimated that at a minimal cost of 0.02 - 0.04 per cent of its average annual GDP growth rate, India can make green growth a reality by putting in place strategies to reduce environmental degradation.

## 1.4 Nationally determined contributions

India targeted about a 20-25 per cent reduction in emission intensity of GDP by 2020 as compared to 2005 levels. India achieved a 12 per cent reduction between 2005 and 2010 and is confident of achieving the above pledge. The UNEP Emission Gap Report 2014 recognized India as an achiever of this voluntary goal. A further goal is to reduce the emissions intensity of its GDP by 35 per cent by 2030 from the 2005 level corresponding to 3.59 billion tons of CO<sub>2</sub> equivalent. There is progress on renewable energy, promotion of clean energy and enhancement of energy efficiency. India further pledges to have 40 per cent of installed electric power capacity originating from non-fossil fuel by 2030 which is a jump of 33 per cent over non-fossil fuel usage in 2015. At present India is running one of the largest renewable capacity expansion programmes in the world, targeting 175 GW by 2022 which will result in abatement of 326 million tons of CO<sub>2</sub> equivalent per annum. The new initiatives also included 100 new smart green cities with built-in climate resilience and sustainable green transportation networks. These initiatives include Swachh Bharat Mission (Clean India Mission), Mission on cleaning of Rivers and Make in India are those with a huge potential of green jobs and green skills development for India.<sup>1</sup>

On 1 October 2015 the Skill Council for Green Jobs (SCGJ) was established by the Government of India under the National Skill Development Mission, promoted by the Ministry

<sup>1</sup> India's NDCs, Ministry of Environment, Forest and Climate Change, Press conference (undated, c 2016).

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of New and Renewable Energy (MNRE) and Confederation of Indian Industry (CII). This is a major development by the Indian government on Green Jobs.<sup>2</sup> The Ministry of Skill Development and Entrepreneurship (MSDE) is also responsible variously for co-ordination of all skills development efforts across the country, removal of disconnects between the demand and supply of skilled manpower, building the vocational and technical training framework, skills upgrading, building of new skills, and innovative thinking not only for existing jobs but also for jobs yet to be created.

Trade union representatives can play a critical role in changing employer attitudes towards 'greening' of the workplace. For example the international role of trade unions in climate

change was evident at the negotiations at the Copenhagen climate summit in 2009. So trade unions and business organizations have extensive experience in the environment and have participated in the different public consultations organized by the Commissions on climate change, energy and energy efficiency. The National Action Plan on Climate Change (NAPCC) (2008) also aimed at advancement of the green economy and climate change mitigation. According to NAPCC India's *per capita* greenhouse gas emissions will not equal *per capita* GHG emissions of OECD countries without compromising its developmental pathway. Accordingly, the NAPCC initiated eight missions to achieve its objectives as set out in Table 1.

**Table 1.** Eight Mission of NAPCC and Current Status<sup>3</sup>

| MISSION  | OBJECTIVE   | CURRENT STATUS  | GREEN SKILLS/EMPLOYMENT OPPORTUNITIES   |
|--|---|---|---|
| <b>Jawaharlal Nehru Solar Mission (JNNSM)</b>          | To form India as a global leader in solar energy.   | 2,970 MW of grid-connected, 364 MW of off-grid, 8.42 million sq.meters of solar thermal collectors installed.   | Direct and Indirect employment opportunities for both skilled and unskilled sector. Jobs creation of nearly 2,00,000 skilled people. <sup>4</sup>   |
| <b>National Mission for Enhanced Energy Efficiency</b> | To motivate growth efficient energy usage.  | By 2015: <ul style="list-style-type: none"> <li>&gt; Annual fuel saving – 23 MToE;</li> <li>&gt; Saving of 19000 MW</li> <li>&gt; CO2 mitigation 98 MT/year;</li> <li>&gt; 478 plants in 8 energy intensive industrial sectors established which reduce energy consumption</li> <li>&gt; distribution of 2.58 million LED bulbs.</li> </ul> | Indirect employment in the form of <ul style="list-style-type: none"> <li>&gt; energy efficiency device technicians;</li> <li>&gt; energy auditors;</li> <li>&gt; Energy efficiency engineers.</li> </ul> |
| <b>National Mission for Green India</b>                | Enhancing carbon sinks in various ecosystems adaptation of vulnerable species forest dependent communities. | Plan has been submitted by 11 States that cover 33 landscapes & working area of 85,000 hectares. Preparatory activities in 27 states.   | Indirect employment to millions of people in rural/tribal belts.  |

<sup>2</sup> <http://sscgi.in/about-us/> accessed in August 2017.

<sup>3</sup> India's Progress in Combating Climate Change, December, 2014 Briefing Paper for UNFCCC COP 20 Lima, Peru, Ministry of Environment, Forest and Climate Change.

<sup>4</sup> Solar power Jobs: Exploring the employment potential India's Grid connected solar market, Council of Energy, Environment and Water Natural Resources Defence Council, August 2014.

| MISSION   | OBJECTIVE   | CURRENT STATUS  | GREEN SKILLS/EMPLOYMENT OPPORTUNITIES  |
|---|---|---|--|
| <b>National Water Mission</b>                                     | Water conservation and minimize its wastage and ensure equitable distribution.  | Revised National water policy, Create 1,082 new ground water monitoring wells.<br><br>Capacity building & training programs.  | In 2016, guidelines for HRD, Training, Capacity building, sensitization and mass awareness were framed. <sup>5</sup>   |
| <b>National Mission for Sustainable Agriculture</b>               | To transform agriculture into an ecologically sustainable climate with its fullest potential that ensures food security.  | Develop 11,000 hectare of degraded land, 5.4 million metric tonne storage capacity, 1 million hectare lands for micro irrigation.   | Capacity building of stakeholders through State Agricultural Universities, ICAR Institutes National/International. Institutes, KVKs, Public/Private R&D Organizations etc (2014). <sup>6</sup>   |
| <b>National Mission for Sustainable Habitat</b>                   | To enhance sustainability of habitat through improvement in energy efficiency in building, urban planning, modal shift towards public transport, waste management & conservation. | 760 water supply projects sanctioned, better transport plan for cities, more than 50 capacity building programs running, energy conservation building code 2007 made mandatory for new & old buildings. | CSE has initiated following:<br>1) Green schools programme. <sup>7</sup><br>2) The Anil Agarwal Environment Training Institute provides several training programmes. <sup>8</sup>  |
| <b>National Mission on Strategic Knowledge for Climate Change</b> | Develop research & technology to identify challenges and the response to climate change.  | 12 thematic knowledge networks established, 3 regional climate models developed, trained 75 high quality climate change professionals.  | 1) Institutional capacity building for 30 institutes working in the area of climate change has been proposed for centres of excellence. An Indo-German centre funded by DAAD is operational at IIT Chennai<br>2) HR Investments: 50 Professional chairs, 75 fellowships awarded at PhD/Post PhD level. A total of 200 researchers/year is targeted. <sup>9</sup> |
| <b>National Mission for sustaining the Himalayan Ecosystem</b>    | To expand measures for the protection of Himalayan glaciers and sustainable ecosystem on mountains.   | Incorporate 6 new centers related to climate change in existing institutions in Himalayan States, various training programs, an observational network is established.                                   | Capacity building programmes for stakeholders in the Himalayan regions including the local communities are undertaken.   |

*Note: The new government is determined to pursue these mission and to achieve sustainable development goals.*

5 [http://wrmin.nic.in/writereaddata/NWM\\_Guidelines\\_HRD\\_2016.pdf](http://wrmin.nic.in/writereaddata/NWM_Guidelines_HRD_2016.pdf).

6 [http://nmsa.dac.gov.in/pdfdoc/NMSA\\_Guidelines\\_English.pdf](http://nmsa.dac.gov.in/pdfdoc/NMSA_Guidelines_English.pdf).

7 <http://www.greenschoolsprogramme.org/schools/the-programme/what-is-a-green-school/>.

8 <http://cseindia.org/taxonomy/term/20108/menu>.

9 [http://www.ifmrlead.org/wp-content/uploads/2015/10/NAPCC/8\\_NMSKCC%20Brief\\_CDF\\_IFMRLEAD.pdf](http://www.ifmrlead.org/wp-content/uploads/2015/10/NAPCC/8_NMSKCC%20Brief_CDF_IFMRLEAD.pdf).

## 2. Changes in the economy and employment shifts

### 2.1 Skilling at school level

The need of the hour is to make skills development aspirational for students in India. Skills training needs to be looked at as a matter of choice which requires vertical growth pathways on the lines of the general education system, so that skills development is also seen as a valid route to earning degrees and diplomas. Therefore qualifications need to be linked with growth and sustainable livelihood pathways and have a causal relationship with increased income for a skilled workforce. Skilling will be integrated with formal education by introducing vocational training classes linked to the local economy from class nine onwards in at least 25 per cent of the schools over the next five years. Seamless integration of skills development in formal education is expected to ignite student interest. All NSQF compliant assessment and certification bodies will be competent to provide support to the School Boards for assessment and certification of the skilling component of technical and vocational education and training, wherever required.

Skilling will be increasingly integrated with higher education, with polytechnics offering NSQF-aligned vocational courses and Bachelor of Vocational Studies degrees. These courses will be aligned to a credit framework which can provide horizontal and vertical mobility. Furthermore, at least 25 per cent of all existing institutions of higher education would offer add-on career-oriented courses with specialized skills at an appropriate NSQF level within the next five years.

### 2.2 Quality Assurance

A Quality Assurance (QA) framework embedded in NSQF will be finalised soon. This will build trust and confidence in the system by putting in place

mechanisms that ensure that the qualifications (and related training) produce consistent quality outcomes and are relevant to the labour market. It will ensure that training providers have the capacity to deliver training that meets quality requirements.

The QA framework will improve the consistency of outcomes linked to certification and consequently improve the status of skills training. It would also lay down the framework for independent assessment and certification system in the country. It will also promote use of the 'Skill India' logo by certifying bodies (those conforming to the QA framework) on their Certificates which can ensure national and international recognition of certified outcomes.

All formal and non-formal technical and vocational education and training including skills training will have to align themselves with NSQF by December 2018.

It is a nationally-integrated skills-based education and competency framework that will provide for multiple pathways, horizontal as well as vertical, within vocational education, vocational training, general education and technical education, thus linking one level of learning to a higher level. This would facilitate both horizontal and vertical mobility with formal education on an outcome-based linkage to a uniform credit framework. A legal framework to support NSQF will also be put in place. The QA framework for certification and assessment will set minimum standards and provide guidance for effective, valid, reliable, fair and transparent assessment within the context of the NSQF.

E-Assessment would be encouraged wherever feasible to scale up capacity and increase convenience. Complete transparency and accountability will be ensured in the assessment process by leveraging technology. CCTV-monitored examinations and biometric

attendance will be encouraged through appropriate incentives for compliant entities where Government support or funding is involved. A central repository of all assessments and certificates will be maintained on the National Portal. The central repository, in addition to being available to employers, will also be available to candidates to enable them to track their performance and future up-skilling options.

Sector Skills Councils (SSCs), as industry-led bodies, will be strengthened by making them more representative, expanding their outreach and increasing their efficiency. The development of National Occupational Standards (NOS) and Qualification Packs (QPs) for various job roles in a sector will remain the key responsibility of the SSCs. The outcome standards for each job role will need to be clearly defined and notified as per NSQF. SSCs will be responsible for ensuring that persons trained as per NOS/QPs are employed by employers in their sector.

Development of standards by SSCs will be under the aegis of National Skills Qualification Committee (NSQC) under NSQF. All NOSs and QPs developed by the SSCs will be examined and reviewed by the NSQC and, thereafter, conferred the status of 'National Standards'. All skills training in the country will necessarily align itself on these national standards.

## 2.3 Recognition of Prior Learning (RPL)

India's unorganized workforce is largely unskilled or semi-skilled and this section of the workforce picks up skills and knowledge in an informal manner by observing people or working under their guidance or through complete self-learning. As a result they may not be able to improve their skills, which affects their productivity and quality of output. Therefore they need access to training programmes and support from their employers to skill and upskill themselves. This is where Recognition of Prior Learning (RPL) can help them become assessed and certified on their current competencies as per NSQF levels.

Thus RPL is the key instrument which can help map *the existing skills in the unorganised sector and integrate the informal sector into the formal skilling landscape*. The RPL framework is an *outcome-based qualification framework* linked to NSQF against which prior learning through formal or informal channels would be assessed and certified. The RPL process would include a pre-assessment, skills gap training and final assessment leading to certification of existing skills at the level of the individual. The RPL certification would be on a par with the certifications following various skills training courses in the country. It will provide both horizontal and vertical pathways to an individual for acquiring additional skills for better livelihoods. *Adequate resources will be earmarked under various government schemes for equitable access to RPL programmes*. The government will provide detailed guidelines for RPL initiatives which will ensure quality and consistent outcomes.

## 2.4 Promotion of skilling amongst women

According to *Census Data 2001*, women account for 48 per cent of the entire population of India. *Women have the capability to drive the economy of the country further* if their participation in the workforce is increased. With the help of skilling, women can have viable incomes, decent work and be major players who can contribute equally to the economic growth of the country. Women's participation in vocational education and training is especially low compared to men's. Special mechanisms in the delivery of training such as mobile training units, flexible timing and training based on the local needs of the area, will be introduced to ensure the participation and mobilization of women.

Training in non-traditional fields for women will be promoted through the establishment of specific training programmes that focus on life skills training modules and literacy training. Apart from that, efforts will be made to increase the pool of women trainers and provide them with certification by earmarking for women a certain

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percentage of the intake in training-of-trainers institutes. New institutes exclusively for training of women as trainees and trainers will also be promoted by Government.

Women-related issues will be incorporated in the guidelines for skills training procedures. These could include issues of safe and gender-sensitive training environments, employment of women trainers and equity in remuneration, and complaint redress mechanisms. An internet- or mobile-based platform for women employment, by connecting skilled women with employers, could be a better platform focusing on women willing to re-enter the workforce after a break and those affected by migration.



### 3. Key policies and regulations

(green, climate change, and related employment / green jobs / skills, policy coherence and coordination, role of social dialogue)

A National Campaign has been launched to create awareness and a positive pro-skilling environment. Communication packages and kits will be standardized to ensure quality and will be made available in all local languages with focused promotion by skills ambassadors including eminent personalities. State camps will be organised for skills awareness and mobilization. Social media will be effectively used to amplify the campaign and build publicity. A TV channel and a national community radio frequency dedicated to skilling will be promoted to facilitate communication, dissemination of information and opportunities relating to skills on a regular basis. The Skill India logo will also be used to promote the value of a skilled workforce and create momentum for skilling among the youth. National Skills Universities and institutes will be promoted in partnership with States as centres of excellence for skills development and training of trainers, either as *de novo* institutions or as a part of the existing university landscape. It is desired that these institutions become as aspirational for candidates as other premier institutes around the country.

To further the aspirations and respect associated with skilling, National Skill Awards will be instituted in close association with major stakeholders. Participation by India on international platforms will be encouraged to showcase the skilling talent in the country. Moreover a National Skills Day will be declared to annually commemorate and celebrate skilling through skills fairs and camps across the country. Counselling and guidance have emerged as the biggest challenges in the skills space today. Good counselling will be useful to create aspiration and reduce attrition rates during training and employment by helping candidates make informed choices. The vast network of existing Post Offices and Citizen Service Centres (CSCs) would be leveraged with industry support to create such a support system for the youth. Furthermore the network

of 285,000 Youth Clubs/Mahila Mandals of Nehru Yuva Kendras, present in 623 districts, would also facilitate provision of counselling and guidance to the youth of the country on various skilling programmes and opportunities. Similarly, the cross-country network of volunteers of Nehru Yuva Kendra Sangathan and the National Service Scheme will also be utilised to create awareness and build a favourable pro-skilling environment among the youth of the country.

The Prime Ministers Skill Development scheme will be introduced to tap talented young individuals who will work with the State and District administration to spread awareness of skills development, identify local needs and steer skills development efforts in the region. Government has carried out comprehensive reforms in the Apprentices Act, 1961 to make it both industry- and youth-friendly.

Government will work together with industry, including the MSME sector, to create a positive environment for increased apprenticeship opportunities in the country. The services sector will also be brought under the ambit of apprenticeship, which will be further incentivised in the MSME sector through appropriate schemes for sharing of stipends and so forth. Government will target a tenfold increase in apprenticeship opportunities in the next five years.



## 4. Skills development measures for the green economy

Skills identification takes place at multiple levels in the entire value chain of the green economy. The skill set requirements are set out at secondary level (under a proposal) where the students would be identified for their inclination towards a particular green skills trade. Skilling is increasingly integrated with higher education, with polytechnics offering NSQF-aligned vocational courses and Bachelor of Vocational Studies degrees. These courses will be aligned on a credit framework which can provide horizontal and vertical mobility. One of the recommendations of previous studies (Green Jobs 2010) was to update course curricula and align them on green skills needs. Now the existing ITIs and Polytechnics are in the process of developing courses and curricula aligned on the emerging competency-based demand in the market.

Skills identification takes place at the central level in 21 Government ministries and at State level through various skills development schemes and programmes. However, the foci of directly-involved entities on identification of the green skills set are as follows:

### Ministry of Labour and Employment (MoLE)<sup>10</sup>

This Ministry is responsible for developing policies and standards under the direction of the National Council for Vocational Training. MoLE is responsible for the development of the National Vocational Qualifications Framework (NVQF), which has now been subsumed under the new NSQF.

### Ministry of Rural Development

The Ministry of Rural Development (MoRD)<sup>11</sup> runs the Swarnajayanti Gram Swarozgar Yojana (SGSY) programme, launched in 1999 and focusing on providing sustainable income opportunities for

the rural poor. As part of the SGSY programme, MoRD is now running a skills placement initiative, Aajeevika Skills.

### Ministry of Skill Development and Entrepreneurship<sup>12</sup>

The Ministry is responsible for co-ordination of all skills development efforts across the country, removal of disconnects between demand and supply of skilled manpower, building-up of the vocational and technical training framework, skills upgrading, building of new skills, and innovative thinking not only for existing jobs but also for jobs yet to be created. The Ministry aims to “Skill on a large Scale with Speed and high Standards” in order to achieve its vision of a ‘Skilled India’.

### National Skills Development Corporation (NSDC)<sup>13</sup>

The NSDC was established in 2009 under a PPP model, with shareholdings of 49 per cent for government and 51 per cent for industry. The NSDC has a target of skilling 150 million people through its network of training providers; 60 are operational to date. Through these training providers NSDC has access to curricula and courseware for over 800 programmes approved in accordance with quality guidelines (ILO, 2013a). According to the ILO, “not all curriculum is freely available to all providers as copyright arrangements vary across the different agreements between the NSDC and its training partners”.

### Skill Sector Councils (SSC)<sup>14</sup>

Sector Skills Councils (SSCs) are designed to be led by industry and develop the NOS for the various roles within the sector they represent. SSCs are mandated by the NSDC to oversee

<sup>10</sup> <http://labour.gov.in/>.

<sup>11</sup> <http://rural.nic.in/>.

<sup>12</sup> <http://www.skilldevelopment.gov.in/aboutus.html>.

<sup>13</sup> <https://www.nsdcindia.org/New/>.

<sup>14</sup> <http://www.skilldevelopment.gov.in/ssc.html>.

**Table 2.** Skill Gaps in Various renewable Sectors (Solar, Bio-Energy and Wind)

| SECTORS           | AREAS                       | SKILL GAPS   |
|-------------------|-----------------------------|--|
| <b>Bio-Energy</b> | R&D                         | <ul style="list-style-type: none"> <li>&gt; Lack of knowledge on oil bearing trees like Jetropha;</li> <li>&gt; Specialized knowledge on bio-diesel, agronomy, crops, soil and climate research;</li> <li>&gt; Pest and disease control.</li> </ul>  |
|                   | Project Management          | <ul style="list-style-type: none"> <li>&gt; Project implementation, management, planning and co-ordination.</li> </ul>   |
|                   | Manufacturing               | <ul style="list-style-type: none"> <li>&gt; Design and fabrications skills in biomass gasifiers;</li> <li>&gt; Hot gas conditioning systems;</li> <li>&gt; Process design.</li> </ul>  |
|                   | Construction / Installation | Erection and commissioning of large-scale and on-grid biomass power projects.  |
|                   | Operation                   | <ul style="list-style-type: none"> <li>&gt; Exposure in handling of biomass-based combustion systems;</li> <li>&gt; Maintenance and repair;</li> <li>&gt; Logistics in biomass collection.</li> </ul>  |
| <b>Solar</b>      | R&D                         | <ul style="list-style-type: none"> <li>&gt; Absence of exposure to advanced technologies such as the wafer technology, semiconductor technology;</li> <li>&gt; Design skill in installing BIPV in buildings.</li> </ul>  |
|                   | Project Management          | Project implementation, management, planning and co-ordination especially in handling CSP.   |
|                   | Manufacturing               | <ul style="list-style-type: none"> <li>&gt; Low skill in module assembly;</li> <li>&gt; System integration in solar PV.</li> </ul>   |
|                   | Construction / Installation | <ul style="list-style-type: none"> <li>&gt; Erection and commissioning of large-scale and on grid solar power projects;</li> <li>&gt; Third party installers not skilled in erection;</li> <li>&gt; Grid integration of mega projects.</li> </ul>  |
|                   | Operation                   | <ul style="list-style-type: none"> <li>&gt; Trouble shooting solar PV circuits;</li> <li>&gt; Techno-commercial marketing skills;</li> <li>&gt; After-sales service and customer care.</li> </ul>  |
| <b>Wind</b>       | R&D                         | <ul style="list-style-type: none"> <li>&gt; Offshore wind technology;</li> <li>&gt; Wind resource assessment;</li> <li>&gt; Optimization of engineering design;</li> <li>&gt; Battery technology;</li> <li>&gt; Fatigue resistant materials;</li> <li>&gt; Design of step-up gearbox.</li> </ul> |
|                   | Project Management          | <ul style="list-style-type: none"> <li>&gt; Design technique to match wind resource, rating and installation.</li> </ul>   |
|                   | Manufacturing               | <ul style="list-style-type: none"> <li>&gt; Manufacturing of high-capacity turbine gearboxes;</li> <li>&gt; Fabrication of wind turbine blades of complex design.</li> </ul>   |
|                   | Construction / Installation | <ul style="list-style-type: none"> <li>&gt; Installation of high-capacity wind turbines.</li> </ul>  |
|                   | Operation                   | <ul style="list-style-type: none"> <li>&gt; Failure analysis of gearboxes.</li> </ul>  |

Source: Compiled by Authors.

**Skills for Green Jobs in India**

assessment and certification of candidates trained by affiliated training providers using the NOS (India, Ministry of Finance, 2013). They have begun to involve private assessment companies from both India and overseas as affiliated providers. All assessment agencies are pre-screened by the SSCs to ensure their ability to undertake assessments against occupational standards; however, the rigour of this process of screening and affiliation is unclear and it is understood that different standards are being applied by different SSCs. SSCs' role can be divided into three broad areas of responsibility:

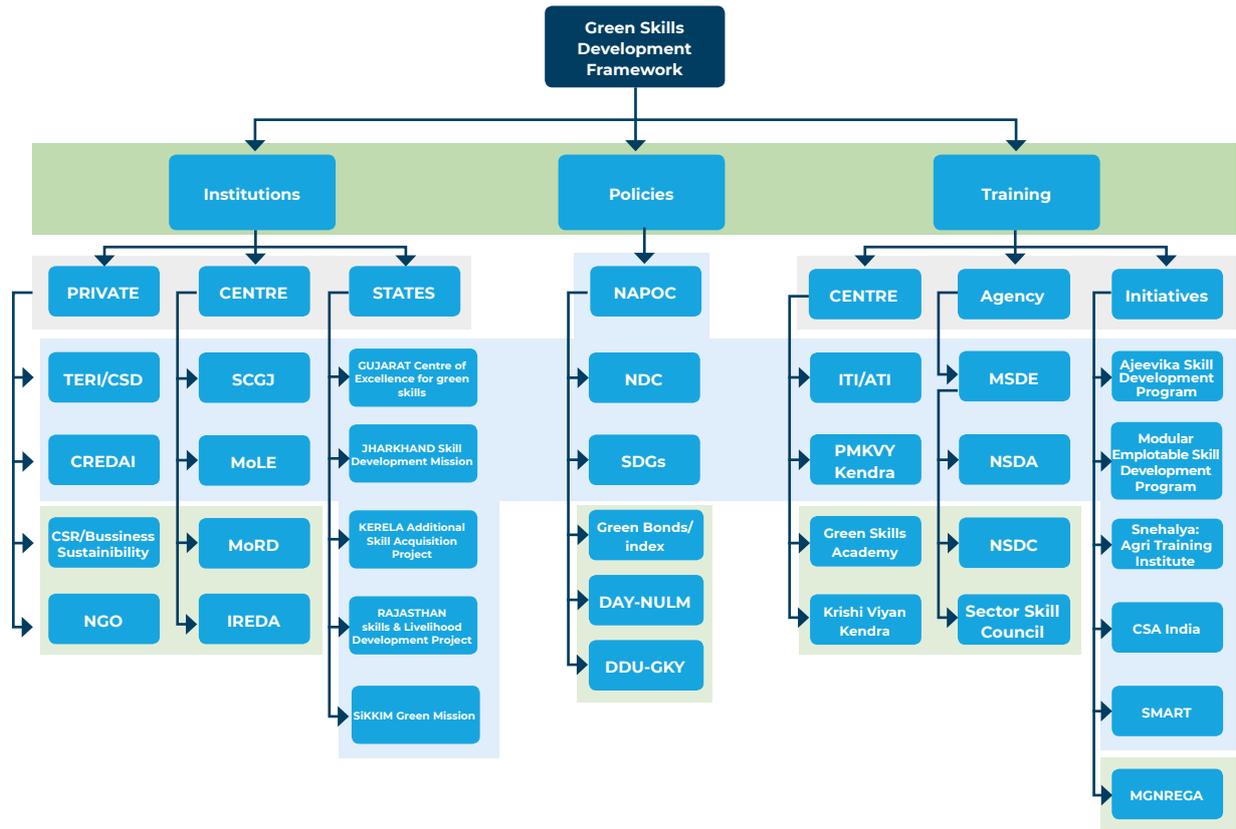
Research: including the creation and maintenance of a skills database, development

of sector-specific competency standards and certifications, provision of careers guidance, benchmarking of international standards, and identification of technology for teaching.

Delivery: including training of trainers, delivery of training modules, development of training delivery mechanisms, and other activities to improve quality and capacity.

Quality assurance (including streamlining of the certification framework, accreditation of training providers, and organisation of certification tests). The SSCs are further responsible for training assessors.

**Figure 1. Green skills development structure & infrastructure**



Source: Compiled by Authors.

**Figure 2.** Key drivers for greening the indian economy



Source: Developed with assistance from SCGJ.

**Figure 3.** Ministries, Departments & various agencies for skilling in India



Source: Developed with assistance from SCGJ.

## Skills for Green Jobs in India

**Skill Council for Green Jobs (SCGJ)<sup>15</sup>**

SCGJ is one of the most important initiatives by the Government of India which directly handles the Green Skill Development Programs of India. It is promoted by the Ministry of New and Renewable Energy (MNRE) and Confederation of Indian Industry (CII).

Its objective is to identify the skilling needs of service users as well as of manufacturers and service providers within the green businesses sector, and implement nationwide, industry-led, collaborative skills development and entrepreneur development initiatives that will facilitate the meeting of India's potential for "Green Businesses".<sup>16</sup>

**Figure 4.** Sectors with greening potential



Source: SCGJ.

**Figure 5.**



Skill Council for Green Jobs has created a robust ecosystem for Skills in RE:

- More than 320 Training Centers across 24 States (Figure as given besides);
- Over 500 Certified Trainers and 150+ Certified Assessors;
- 13,000+ candidates have been Trained and Certified.

<sup>15</sup> <http://sscgi.in/>.

<sup>16</sup> <http://sscgi.in/publications/research/> accessed in August 2017.

**Table 3.** Cumulative Jobs in Green Businesses

| SI. NO.             | SECTOR                 | SUB SECTOR                               | TILL 2020         | TILL 2030         | 2021-2030         |
|---------------------|------------------------|--|-------------------|-------------------|-------------------|
| 1                   |                        | Solar Photovoltaics                      | 180,00            | 900,00            | 720,000           |
| 2                   |                        | Solar Thermal                            | 14,500            | 35,000            | 20,500            |
| 3                   |                        | Wind Power                               | 60,000            | 180,000           | 120,000           |
| 4                   |                        | Small Hydro Power                        | 10,000            | 30,000            | 20,000            |
| 5                   | Renewable Energy       | Biomass/ Cogen / CHP                     | 25,000            | 100,000           | 75,000            |
| 6                   |                        | Energy Storage                           | 50,000            | 300,000           | 250,000           |
| 7                   |                        | Biofuels, Biogas, Pellets and Briquettes | 55,000            | 275,000           | 220,000           |
| 8                   |                        | Clean Cook Stoves                        | 75,000            | 2,968,600         | 2,893,600         |
| <b>Sub Total RE</b> |                        |  | <b>469,500</b>    | <b>4,788,600</b>  | <b>4,319,100</b>  |
| 9                   | Green Construction     | Green Buildings / Campuses               | 2,200,000         | 11,000,000        | 8,800,000         |
| 10                  | Green Transportation   |  |                   |                   |                   |
| 11                  | Carbon Sinks           |  | 240,000           | 2,100,000         | 1,860,000         |
| 12                  | Water Management       |  | 3,000,000         | 19,000,000        | 16,000,000        |
| 13                  | Solid Waste Management |  | 4,000,000         | 19,800,000        | 15,800,000        |
| 14                  | E-Waste Management     |  | 170,000           | 582,000           | 412,000           |
| <b>Total</b>        |                        |  | <b>10,829,500</b> | <b>64,770,600</b> | <b>53,941,100</b> |

## 4.1 TVET provision for new green occupation and for greening established jobs / occupations

### National Skill Development Agency (NSDA)<sup>17</sup>

The NSDA established in 2013 is responsible for overseeing the NSQF's quality and standards, ensuring they meet sector needs, and for setting up additional professional certifying bodies and facilitating capacity-building. SSCs will now be

regulated by the National Skill Qualification Committee (NSQC). The NSQC will be part of the NSDA but does not appear to be operational as yet. At present the NSDA is working to rationalise the approach and duration across different skills development schemes; part of the methodology is the delivery of independent evaluations of the MES-SDI and STAR schemes. According to the NSDA, working to rationalise skills development provision at State level is important; in their experience States are finding the different training schemes difficult to understand and implement.

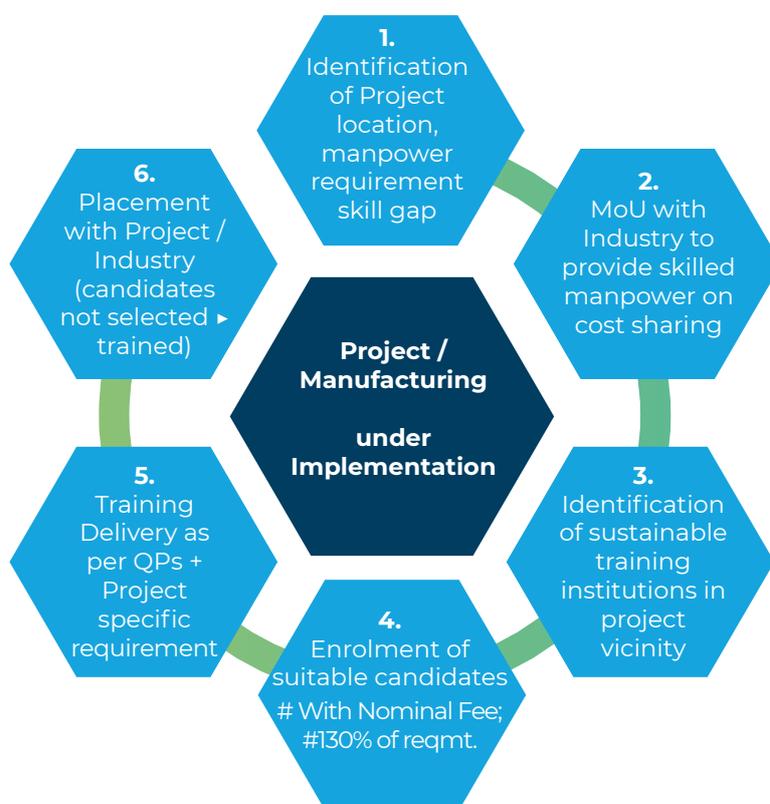
## National Skills Qualification Framework<sup>18</sup>

The National Skills Qualifications Framework (NSQF) organizes qualifications in accordance with a set of levels of knowledge, skills and aptitudes. These levels are defined in terms of learning outcomes which the learner must possess regardless of whether they were acquired through formal or informal learning. In that sense the NSQF is a quality assurance framework. It is, therefore, a nationally-integrated education and competency-based skills framework that will provide multiple pathways, horizontal as well as vertical, both within vocational education and training and also between vocational education and training, general education and technical education, thus linking one level of learning with a higher level. This will enable a person to acquire

the desired competency levels, transit to the job market and, at an opportune time, return for acquisition of additional skills to further upgrade their competencies. Key elements of the NSQF include:

- Recognition of skills and competencies at various levels, which are equivalent to international standards and allow greater international mobility for students and workers;
- Defined pathways for skills progression;
- An opportunity for ongoing skills development and lifelong learning;
- Industry and employer partnerships.
- Transparency;
- Greater recognition of prior learning.

**Figure 6.** Roadmap for undertaking green skilling projects



Source: Compiled by authors based on Discussion in SCGJ.

18 <http://www.nsda.gov.in/nsqf.html>.

The above figure represents the roadmap identified by various SSCs & SCGJ on how to incorporate green skills in the wider skilling framework. Private players were approached to sign MOUs in order to design and execute QPs specifically targeted on the needs of a particular

company. The skills councils were involved right through from skilling to certification and placement. This helped private players to have the required level of skilled workforce in remote areas while helping in the greening of overall industry operations.

**Table 4.** Newly approved courses for creation of green jobs

| S.NO | NAME OF QUALIFICATION PACK  | OCCUPATION   | NSQF LEVEL | NOTIONAL HOURS | ENTRY QUALIFICATION   |
|------|---|--|------------|----------------|---|
| 1    | SGJ/Q0101: Solar PV Installer (Suryamitra)                          | Installation, Operation and Maintenance                      | 4          | 300            | 10 <sup>th</sup> Pass + ITI/Diploma (Electrical , Electronics, Civil, Mechanical , Fitter, Instrumentation, Welder)   |
| 2    | SGJ/Q0102: Solar PV Installer - Electrical                          | Installation & commission                                    | 4          | 200            | 10 <sup>th</sup> Pass + ITI/Diploma (Electrical , Electronics )   |
| 3    | SGJ/Q0103: Solar PV Installer - Civil                               | Solar pv installation  | 4          | 180            | 10 <sup>th</sup> Pass + ITI/Diploma (Electrical , Electronics, Civil, Mechanical, Fitter, Instrumentation, Welder, Mason )  |
| 4    | SGJ/Q0104: Rooftop Solar Photovoltaic Entrepreneur                  | Rooftop solar photovoltaic entrepreneur                      | 6          | 120            | B.E / B.Tech / Any graduate with science background, preferred  |
| 5    | SGJ/Q0105: Solar Proposal Evaluation Specialist                     | Solar project evaluation                                     | 7          | 80             | B.E / B.Tech / BBA / B.com / B.sc / C.A Experience: Minimum 2 years of Experience in financial institute/ Bank / Managing Project Finance for B.E / B.Tech / BBA / B.com / B.Sc. No Experience required for MBA / CA. |
| 6    | SGJ/Q0106: Rooftop Solar Grid Engineer                              | Inspection, Interconnection and Post – Commissioning Testing | 5          | 80             | Diploma (Electrical, EE)  |
| 7    | SGJ/Q0107: Solar PV Business Development Executive                  | Business development   | 5          | 140            | B.B.A./B.Com./B.Tech.   |
| 8    | SGJ/Q0108: Solar PV Site Surveyor                                   | Solar site survey  | 6          | 120            | Diploma/ B.E./ B.Tech. preferably in Civil Engineering  |
| 9    | SGJ/Q0109 Solar PV Structural Design Engineer                       | Designer   | 5          | 200            | Degree /Diploma in Civil Engineering /Structural Engineering  |
| 10   | SGJ/Q0110: Solar PV Designer  | Designer   | 7          | 200            | B. Tech/ B.E. (Solar/ Electrical, Electronics, Civil, Mechanical/ Energy Systems) or M.Tech (Solar/ Renewables/ Energy Studies)   |
| 11   | SGJ/Q0111: Solar PV project helper                                  | Installation, operation and maintenance                      | 2          | 200            | 5 <sup>th</sup> Pass preferably   |
| 12   | SGJ/Q0112: Solar PV Engineer (Option: Solar Water Pumping Engineer) | Design, installation and commissioning                       | 5          | 300+120        | Diploma ( Electrical / Electronics / Civil / Mechanical) or Pre-final engineering and technology candidate with 3 years of formal engineering education   |

## Skills for Green Jobs in India

| S.NO | NAME OF QUALIFICATION PACK   | OCCUPATION                           | NSQF LEVEL | NOTIONAL HOURS | ENTRY QUALIFICATION   |
|------|--|--------------------------------------|------------|----------------|---|
| 14   | SGJ/Q0114: Solar PV Project Manager (E&C)                              | Project management                   | 7          | 80             | B.E/ B.tech in Engineering and technology or construction management or related discipline  |
| 15   | SGJ/Q0115: Solar PV Maintenance Technician - Electrical (Ground Mount) | Operation & maintenance              | 4          | 200            | ITI-Electrical and Electronics  |
| 16   | SGJ/Q0116: Solar PV Maintenance Technician -Civil                      | Operation & maintenance              | 4          | 200            | 10 <sup>th</sup> pass preferred   |
| 17   | SGJ/Q0117: Solar PV OM Engineer  | Operation and maintenance            | 5          | 200            | Diploma (Electrical / Electronics/ Civil/ Mechanical )  |
| 18   | SGJ/Q0118: Solar Off Grid Entrepreneur                                 | Entrepreneur                         | 5          | 200            | 12 <sup>th</sup> pass preferred   |
| 19   | SGJ/Q0119: Solar PV Manufacturing Technician                           | Manufacturing                        | 4          | 200            | 10 <sup>th</sup> pass preferred   |
| 20   | SGJ/Q0601: Solar Domestic Water Heater Technician                      | Installation and maintenance         | 4          |                | 8 <sup>th</sup> pass preferred  |
| 21   | SGJ/Q0602: Solar Thermal Plant Installation and Maintenance Technician | Installation and maintenance         |            |                |   |
| 22   | SGJ/Q0603:Solar Thermal Engineer - Industrial Process Heat             | Design, installation and maintenance |            |                |   |
| 23   | SGJ/Q2101: Improved Cook-Stove Installer Qualification Pack            | Installer                            | 4          | 200            | 5 <sup>th</sup> pass preferred  |
| 24   | SGJ/Q6101:Recyclable Waste Collector and Segregator                    | Waste collection & segregation       | 4          | 160            | 5 <sup>th</sup> pass preferred  |
| 25   | SGJ/Q6102: Safai Karamchari  | Sanitation                           | 3          | 160            | 5 <sup>th</sup> pass preferred  |
| 24   | SG/Q6103: Waste Picker   | Solid waste collection               | 3          | 160            | NA  |
| 25   | SGJ/Q6601: Wastewater treatment plant technician                       | Operation & maintenance              | 4          | 200            | 12 <sup>th</sup> pass/ 10 <sup>th</sup> pass+ ITI / Diploma/ 8 <sup>th</sup> pass +4 years' experience as wastewater treatment helper |
| 26   | SGJ/Q6602: Wastewater treatment plant Helper                           | Operation & maintenance              | 3          | 160            | 8 <sup>th</sup> pass  |

Source: Compiled by authors from SCGJ.

## 4.2 ALMPs and retraining measures

(including role of employment service providers: which target groups of the population need retraining the most and which ones benefit from retraining and ALMP measures the most?)

A focused group discussion was held with various stakeholders which included experts from government departments, academic institutions, industry and trade unions (list attached). Conclusions from the discussions are depicted in the following figures:

Figure 7



Figure 8

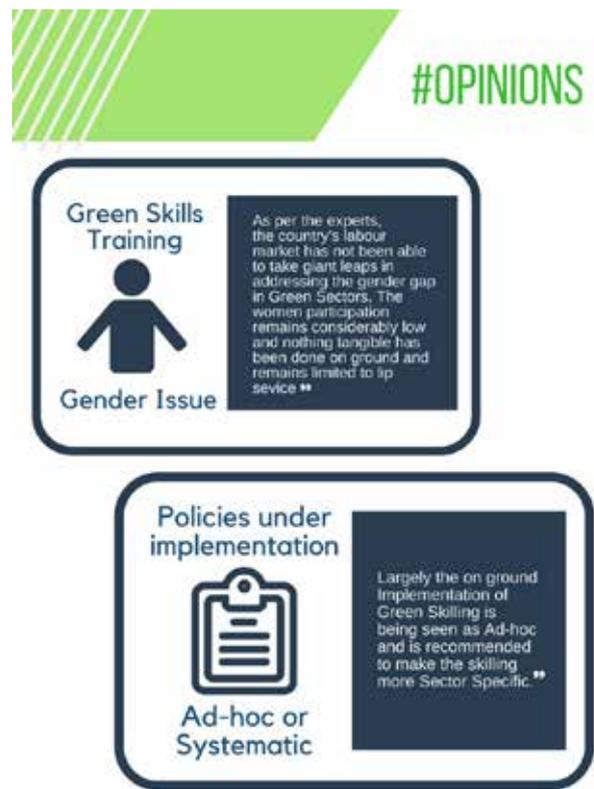


Figure 9



### 4.3 The role of the private sector in skills training (sectoral approaches, apprenticeship training, on-the-job training by enterprises for current workforce, existing support measures and incentives)

In spite of various initiatives by the government such as “Make in India” and recently “Skill India”, a vast mismatch between supply and demand of skilled talent was observed. To bridge this mismatch of skilled and trained workers the private sector can play a vital role by providing the necessary resources and expertise in various domains. However while the private sector has started various skilling initiatives they need to achieve deeper penetration with formal colleges and government initiatives in order to create better impact with long-term solutions (Siddarth Bharwani, VP, Jetking Infotrain Ltd). The private sector has huge skills training potential in sectors such as Construction, Automobiles, Tourism and Hospitality, and ICT sectors. It can make an impact on scaling-up of skills training by collaborating with the Sector Skill Council (SSC) in identifying skills gaps in current job roles, in development of existing and new job roles through National Occupation Standards (NOS), linking productivity with technological interventions, and in setting quality standards for training courses. Private sectors can competently assess the requirement for different kinds of workers by making demand forecasts, as they are major recruiters of skilled and trained workers for different jobs. The majority of private industries have facilities and are equipped with in-house design, development and delivery of training to suit their needs. There are many successful models of vocational training, among which the German model is described as the most successful. Aligned with the German apprenticeship model the private sector could spearhead and promote “earn-while-you-learn” and apprenticeship in collaboration with the Ministry of Skills (Labour and Employment).

The private sector has started training and building green skills development programmes to meet inhouse as well as external demand. However, the private sector needs diffusion with

formal colleges and government initiatives for long-term impact. In 2016 Indian companies were ranked among the top 200 in the world, and ten were in the top 500 Green Companies.

The present government has laid much emphasis on privately-owned small businesses with a focus on green initiatives. Some scenarios from the private sector are as follows:

**Changing the CSR landscape:** India’s CSR landscape is showing improvements. There has also been a change in terms of companies choosing to opt for sustainable supply chains which require a change in the employees’ skill sets to match the newer green skills. The number of firms committing themselves to human rights policies rose from 40 in 2015 to 54 in 2016.

#### Business sustainability reporting

While not mandatory, preparation of sustainability reports is on a rising trend in India. The rate of reporting grew over 20 per cent between 1999 and 2009. About 63 per cent of the top 100 companies and 77 per cent of non-100 companies now prepare sustainability reports, the majority of which use the GRI framework. This requires a change in the entire system and therefore the need for new skills development is identified in the process.

#### Case Studies

##### IL&FS Skills Development Corporation (IL&FS Skills)

IL&FS Skills Development Corporation (IL&FS Skills) is India’s largest vocational training company. The setting up of IL&FS Skills was triggered by the increasing demand of trained manpower for the jobs created in various sectors as a result of our Cluster Development Initiative. From being a pilot programme offered for textile sector, today it is a partnership company with National Skills Development Corporation (NSDC), with a mandate to train 40 lakh people by 2022 through a network of 100 multi skill Institutes (Hubs) and 300 single skill Schools (Spoke).

IL&FS Skills launched Skills Programmes for Inclusive Growth (SPRING), a bouquet of services

which address the manpower demand –supply gap. These focus on those Not in Education, Training or Employment (NEET) by addressing the dual challenge of access to quality institutions and affordability by Bottom of Pyramid (BoP) groups. SPRING is delivered through the current network of 219 institutes of skills in all the states of India taking skills programmes to the remotest corners of the country. It comprises of the following 6 focus areas:

- **Skills for Jobs:** Skills Programmes linking trainees to placements in organised sector
- **Skills Upgradation:** Re-skilling & upskilling of people already in jobs
- **Skills for Good Governance:** Training of government functionaries on work skills and IT for improved governance
- **Skills for Schools and Colleges:** Vocational education aligned to National Skills Qualification Framework (NSQF) for students of schools and colleges (undergraduates/ graduates and post graduates)
- **Skills for Trainers:** Upto 1 month domain specific training called MASTERY for Master Trainers and Trainers
- **Skills for Entrepreneurship:** Self Employment training for MSME, rural artisans and especially women

**Table 5.** Indicative courses offered by private entities with orientation towards greening

| S NO | SECTOR                       | NO OF COURSES | NSQF LEVELS | ELIGIBILITY STANDARD               |
|------|------------------------------|---------------|-------------|------------------------------------|
| 1.   | Agriculture                  | 4             | 2 & 4       | From No entry level barrier - 12th |
| 2.   | Apparel, Footwear etc        | 7             | 2, 3 & 4    | 5th – 8th                          |
| 3.   | Automotive                   | 8             | 2, 3 & 4    | 8th - 12th                         |
| 4.   | Beauty & Wellness            | 2             | 3           | 5th – 8th                          |
| 5.   | Banking, Finance & Insurance | 8             | 3 & 4       | 10th - Graduation                  |
| 6.   | Capital Goods                | 3             | 2,3, 4      | 10th - Diploma                     |
| 7.   | Construction                 | 6             | 1,2,3       | 5th – 10th                         |
| 8.   | Electronics                  | 4             | 4           | 8th – Diploma                      |
| 9.   | Solar PV                     | 1             | 4           | 10th - Diploma                     |
| 10.  | Gems & Jewellery             | 1             | 4           | 12th                               |
| 11.  | Handicraft & Carpet          | 1             | 3           | 5th                                |
| 12.  | Healthcare                   | 2             | 3 & 4       | 8th - 12th                         |
| 13.  | Hospitality                  | 3             | 2, 4 & 5    | 5th – 10th                         |
| 14.  | IT & ITES                    | 14            | 4, 5, 7     | 10th - Graduation                  |
| 15.  | Security                     | 1             | 4           | 8th                                |
| 16.  | Tourism                      | 1             | 5           | 12th                               |

Source: Compiled by Authors from <http://www.ilfsskills.com/CoursesOffered.aspx>

### The Energy Resource Institute (TERI) and TERI University

The Energy Resource Institute (TERI) works with school teachers, national and international educationists, policy-makers, NGOs, cultural networks etc. with the youth through a number of projects e.g. BEACON, a school education programme on energy conservation and its efficient use under the aegis of the Bureau of Energy Efficiency (BEE), Ministry of Power, Project Climate Educhange, a school programme that harnesses the power of information and communication technology (ICT) to provide a platform for students in 400 schools across 12 cities in India to share information on climate change; Project SEARCH, a school programme on waste management and to encourage youth to practice the 4Rs - refuse, reuse, reduce, and recycle - in their daily lives; and Project E for Energy Efficiency, a programme to sensitize students, teachers and the larger school fraternity on energy conservation.

Centre for Sustainable Development identifies critical issues in the context of the present and the future to achieve sustainable outcomes. It promotes the involvement of different stakeholders (including government) and build capacity to achieve sustainability across sectors. Green Skills Academy is a first of its kind initiative by the Centre energy which has assessed the technological and human resource capabilities to address green skills training and development. GSA has the understanding of industry demand for green skills and employment potential

Various Courses offered are:

- **Urbanisation:** Smart cities/Climate Resilient Cities– Concept and Implementation;
- **Water:** Water Management Services;
- **Waste:** Municipal Solid Waste Management;
- **Energy:** Renewable Energy and Energy Efficiency - Solar, Wind, Bio Energy, Energy Conservation;
- **Construction:** Green Construction, Building Facility Management Services;
- **Agriculture:** Rooftop Gardening Services.

### Skill development at Confederation of Real Estate Developers' Associations of India (CREDAI)

Skill development at CREDAI: CREDAI is a body representing 11,940 private Real Estate developers spread across 23 state level chapters and 171 cities in India. CREDAI is conducting regular On-site Training Programs for construction workers at construction sites. The training is a mix of 'Classroom' and on the job training' conducted at the construction sites itself for a period of about six weeks. These trainings are based on National Occupational Standards (NOS) and Qualification Packs (QP) of NSDC aligned for industry specific job role. The classroom training apart from technical aspects also has soft skill trainings focussing on the social and behavioural habits of the trainees, including health, sanitation and safety to bring significant improvements in their world view and way of life.

CREDAI, with its principal interest in Housing and Habitat, is obviously concerned with Skill requirements of the industry. It is in this background that CREDAI is focusing on Skill Development in the Construction and related sectors. The driving force of CREDAI in organizing its Skill Development trainings is that, as an industry body, it has the best understanding of required skills which need to be developed. Further CREDAI is in a position to easily absorb the trained resources in the industry itself through its members. Hence, there is an excellent opportunity before CREDAI to meet its own requirements & also to contribute to Nation building.

CREDAI forayed into the arena of Skilling sector with its state of the art training program "Kushal" in 2011 through its Pune Chapter in collaboration with National Skills Development Council. Since then, CREDAI is conducting regular On-site Training Programs for construction workers at construction sites through its member developers spread across 23 states and 168 city chapters. The training is a mix of 'Classroom' and on the job training' conducted at the construction sites itself for a period of about four weeks. These trainings are based on National Occupational Standards (NOS) and Qualification Packs (QP) of NSDC aligned for industry specific

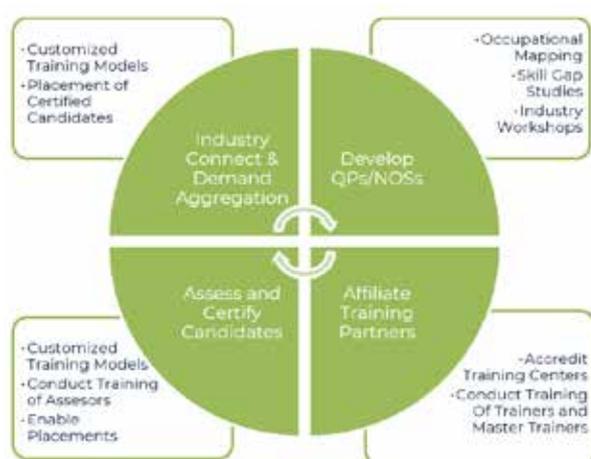
job role. The classroom trainings apart from technical aspects also has soft skill trainings focusing on the social and behavioural habits of the trainees, including health and sanitation, aspects of workers' safety etc. which help the workers (trainees) to bring significant changes in their lifestyles. Such skill trainings have helped the construction worker to gain self-confidence. Once they undergo the trainings, raw/unskilled workers look forward to handling semi-skilled jobs and semi-skilled workers to jobs requiring skilled manpower. As a result, Wage Enhancement is almost assured for all of those undergoing such trainings.

CREDAI has so far trained more than 50,000 trainees in over 100 construction sites across 30 cities. CREDAI aims to undertake Skilling for at least 1 lakh Construction Workers in a year w.e.f. 2017-18.

CREDAI has operational offsite skill training centers in Murshidabad and Mednipur. The Off-site training centers soon going to be operational in Vijayawada, Nashik, Gulbarga and Dahod. We have also identified few more sites for off-site centers in Orissa, Jharkhand, Chhattisgarh Uttar Pradesh and Bihar.

#### 4.4 The role of institutional set-up (e.g. sector / industry skills councils and other sectoral bodies, inter-ministerial coordination, HRD councils / committees, PPPs etc.)

**Figure 10**



The annual skilling activities in the country were estimated to reach around seven million people in 2014. In the current landscape, capacity is being created by private sector training organisations, industry in-house training, government and private Industrial Training Institutes (ITIs), Advanced Training Institutes (ATIs), tool rooms, and units in schools, colleges and polytechnics. For all the existing and new capacity being generated, the focus will move from inputs to the outcomes of skills training that include employability and placement of trainees. Incentives will be linked to placement in all training institutions. For Government-supported schemes, funding will be linked to the outcomes of the training programmes.

Government will support the creation and use of infrastructure in both public and private domains through appropriate equity, grant and loan support. It will continue to encourage entrepreneurs to enter into the skills training space by providing milestone-linked funding support through existing and new institutional mechanisms.

For ensuring greater accessibility and equity, a targeted approach of preferential empanelment, approval and funding of training providers will be put into place for the sectors and geographical areas in which training capacity is clearly inadequate. Appropriate PPP models will be promoted to expand capacities in unserved areas.

India has a tremendous amount of underutilised hard and soft infrastructure. For instance, there are over one million institutional buildings that are used for less than 40 hours a week. Skilling is a challenge which requires the supply to be close to the skills catchment, thus it is essential to take skilling to the remotest parts of the country and scale up quickly, which is only possible by using this existing infrastructure. By designing suitable incentive schemes, existing infrastructure in terms of both buildings and potential teachers would be optimally leveraged for skills training. There are over 1.55 million schools, 25,000 colleges, 3,200 polytechnics and 83 youth hostels, around 150,000 post offices and over 100,000 kiosks across the country. Schools and colleges will be used during holidays

## Skills for Green Jobs in India

and “off-hours” for training purposes; shop floors of industries will be utilized for practical training and so forth. Existing institutions in the agriculture sector such as Krishi Vigyan Kendras, Agro-business clinics, and the Indian Council of Agriculture Research (ICAR) will also be utilized for providing skills training. There is availability of 65,000 kms of railway network in the country with over 8,000 stations, of which a large proportion have adequate infrastructure facilities, electricity supply and an extensive optical fibre cable (OFC) network. The possibility of leveraging this to deliver short-term skilling courses and promote awareness would be explored.

New ITIs will be set up in PPP mode, especially in unserved areas of the country, to expand the outreach of skilling programmes. Further, higher-order skilling will be promoted through ATIs and Multi-Skill Institutes (MSIs) set up in PPP mode with strong industry linkages. These institutes will focus on long-term skilling (1-3 years) and will be located near the demand centres as Skill Hubs fostering apprenticeships and placements. These institutes will be affiliated to Skill Universities to provide the bridge into general higher education through diplomas and certificates based on a credit framework aligned on the appropriate NSQF level. They will function in a hub-and-spoke model to ensure greater outreach. A network of spokes in the form of livelihood colleges, ITIs, ITCs and private training centres already exists across the country and will be further promoted to focus on imparting employable skills up to NSQF Level 4.

State Governments would be encouraged to setup Kaushal Vardhan Kendras (KVKs) at panchayat level for mobilising and imparting skills pertaining to local employment or livelihood opportunities to school drop-outs, adolescent girls, housewives and rural youth.

Each KVK will be linked to the nearest ITI/MSI/ATI for capacity-building, curriculum development, assessment and certification. The KVKs will also function as counselling and guidance centres for youth to help them make informed choices. NGOs will also be equipped to run these centres in their areas of operation. Some State governments are already working in this direction. Their efforts would be further

encouraged to ensure setting-up of at least one KVK in each block within the country over the next five years.

Private Sector initiatives in skilling will be encouraged and would be entrusted to NSDC to create skilling capacity in the country. For this purpose NSDC would continue to catalyze the creation of market-based, scalable business by providing funding through a combination of debt, equity and grants to the private sector to build capacity. This capacity would be created on a self-sustainable model through Private Training Partners to cater for the skilling needs of educational dropouts in rural and urban areas to bring them back to sustainable livelihood options.



## 5. Annexes

### 5.1 Analysis of case studies

#### Q Case Study I. Potential for green jobs in the building and construction sector in India

##### Introduction

The building and construction sector, also known as the real estate sector, is one of the most globally pervasive sectors across the world. Construction activities are an important indicator of development as they create investment opportunities across various related sectors. This sector has been growing fast in India, although a dip was recently observed which was attributed to demonetization in 2016. The sector is fragmented in construction activities across all segments, with medium-sized companies specializing in niche activities, and small and medium contractors who work on a subcontractor basis and carry out the work in the field. However, it is an organized sector

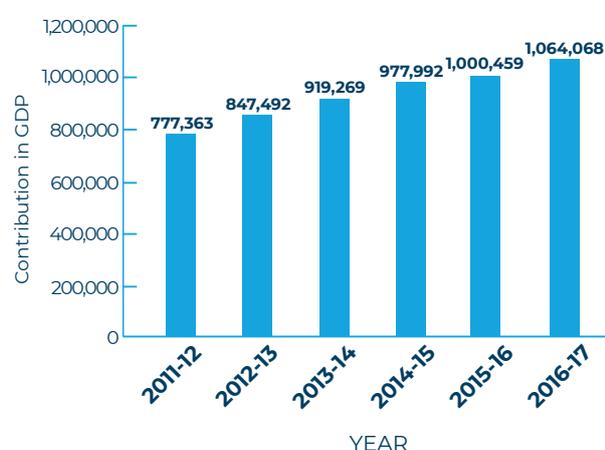
comprising both public and private companies such as L&T Engineering Construction & Contracts Division (ECC), Larsen & Toubro Limited, Tata Projects Ltd, IRCON International Ltd, and so on. According to an estimate in 2011, there were a little over 500 construction equipment manufacturing companies in all of India ([https://en.wikipedia.org/wiki/Construction\\_industry\\_of\\_India](https://en.wikipedia.org/wiki/Construction_industry_of_India); retrieved on 25.06.2017).

##### Potential of the sector

The construction sector has been contributing considerably to economic growth and has played a pivotal role in India's development plans. In 2017 the contribution of construction sector to India's economy was about eight per cent (Figure 9). FDI (Figure 10) in this sector is similarly considerable.

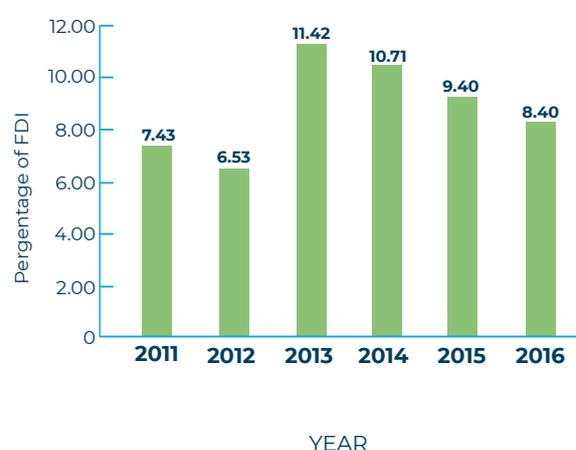
The construction sector is labour-intensive, requiring many human resources, skilled, semi-skilled and non-skilled. Generally, the non-skilled person works in the brick kiln industry where working conditions are extremely poor. The demand for human resources in the

**Figure 11.** Contribution of construction sector in GDP at current prices (in INR)



Source: <http://statisticstimes.com/economy/sectorwise-gdp-contribution-of-india.php>

**Figure 12.** Percentage inflow of FDI in construction sector



Source: <https://www.ibef.org/industry/real-estate-india>

construction sector is on the rise as this sector is gradually expanding in semi-urban and rural areas. Other booming sectors such as IT and ITeS services, one of the largest job creation sectors, are approaching saturation whereas the real employment opportunities lie in building, construction and real estate, followed by skills-based and daily user-oriented sectors such as beauty and wellness, according to report by The Associated Chambers of Commerce & Industry of India (ASSOCHAM). (<http://www.assochem.org/newsdetail.php?id=6310>; Retrieved on 29.06.2017).

According to KPMG (2016), the construction sector in India is expected to be the third largest sector by 2030, contributing over 15 per cent to GDP. The report projected that the real estate and construction sector is expected to generate 75 million jobs by 2022 and emerge as the largest employer in the country, and market size is projected to exceed \$1 trillion (nearly Rs 66.5 lakh crore) by 2030 (cross-reference from FirstPost, 29 June 2017).

### Scope of green jobs

Following economic liberalization, the process of urbanization is growing at a faster rate in India. According to the 1901 census the urban population of India was 11.4 per cent of the total. The urban population share had increased to 28.5 per cent in 2001 then to 31.2 per cent in 2011 (Census of India, 2011). The UN estimates that by 2030, about 40.8 per cent of the Indian population is expected to reside in urban areas. This indicates the likelihood of a surge in the growth of the construction section in India. The government of India has initiated several large programmes (Smart Cities, Housing for All, AMRUT, HRIDAY etc.) along with policy support to accommodate a vast population base. Under the KPMG estimates, almost 110 million houses would be required by 2022 in urban as well as rural India to provide housing for all citizens. Moreover, the Government's 'Smart City' initiative may boost the building and construction infrastructure. The development of 'Smart City' will certainly increase the potential for green jobs in India as its philosophy is based on the sustainable growth of the construction sector.

### Demand for jobs in the construction sector

The construction sector is an emerging sector in India due to urbanization and provision of affordable housing for the Indian people. McKinsey Global Institute's report estimated that the construction sector has potential to add 50 million jobs over the next 10 years.

The government's infrastructure projects, including ambitious projects such as the Sagarmala<sup>19</sup> for new ports and 100 Smart Cities, could contribute to a major demand of workers in this sector. ILO (2016) estimates that the largest increase in non-agricultural employment has been in the construction sector, its share of employment in rural areas having increased from 14.4 per cent (1999-2000) to 30.1 per cent (2011-12) (India Labour Market Update, ILO, July 2016, New Delhi). The segment-wise job potential in construction sector is given in the Table 6.

**Table 6.** Jobs in the construction sector in Lakhs (1 million = 10 lakhs)

| SEGMENT   | 2013         | 2017         | 2022         |
|---|--------------|--------------|--------------|
| <b>Building, Construction &amp; Real Estate</b>       | <b>401.4</b> | <b>519.5</b> | <b>666.2</b> |
| Buildings   | 355.2        | 459.7        | 589.6        |
| Demolition & site preparation                         | 3.4          | 4.5          | 5.7          |
| Electrical plumbing and other construction activities | 10.0         | 12.9         | 16.6         |
| Building completion and finishing                     | 32.7         | 42.4         | 54.4         |
| <b>Infrastructure</b>                                 | <b>52.8</b>  | <b>74.5</b>  | <b>99.3</b>  |
| Roads & Railways                                      | 42.8         | 60.4         | 80.5         |
| Utility projects                                      | 7.9          | 11.2         | 14.9         |
| Civil engineering projects                            | 1.8          | 2.6          | 3.5          |
| Buildings   | 0.2          | 0.3          | 0.4          |

Source: <https://www.bloombergquint.com/union-budget-india/2017/01/25/budget-2017-the-need-to-skill-workers-at-indias-construction-sites>; Retrieved on 12.07.2017.

<sup>19</sup> Sagarmala project is a strategic initiative of the Government of India to modernize India's Ports so that port-led development can be augmented and coastlines can be developed to contribute in India's growth.

## Government initiatives and challenges

The construction sector is one of the dispersed sectors and workers engaged in it are in general unskilled, engaged particularly in brick kiln manufacturing units and associated activities. This sector comprises several segments such as buildings, demolition and site preparation, electrical installations, plumbing, building completion, finishing, utility projects and civil engineering projects. These segments require massive skilled human resources, which India is not able to provide owing to a shortage of skilled workers.

According to the National Skill Development Corporation (NSDC) the workforce in the construction and real estate sector will reach approximately 76 million by 2022. Of that total, 97 per cent between the ages of 15 and 65 are likely to have had no training before they start working (Bloomberg Quint January 25, 2017). About 80 per cent of employment in real estate is attributable to minimal skills, resulting in substantial wastage of time and materials.

Hence, for sustainability construction sector workers require proper training which may lead to green jobs in the construction sector through certification and skills enhancement. To create a skilled pool of workers NSDC was set up as a Public-Private Partnership model for catalyzing the skills landscape in India. The objectives of NSDC comprise the following (Ministry of Skill Development and Entrepreneurship, Government of India):

- i) upgrade skills to international standards through significant industry involvement and develop necessary frameworks for standards, curriculum and quality assurance;
- ii) enhance, support and coordinate private sector initiatives for skills development through appropriate Public-Private Partnership (PPP) models; strive for significant operational and financial involvement of the private sector;
- iii) play the role of a “market-maker” by bringing financing, particularly in sectors where market mechanisms are ineffective or missing; and

- iv) prioritize initiatives that can have a multiplier or catalytic effect as opposed to one-off impact.

(<http://www.skilldevelopment.gov.in/nationalskilldevelopmentcorporation.html>, retrieved on 13.07.2017):

Subsequently over 5.2 million students were trained and 38 Sector Skill Councils (SSC) were approved in manufacturing, agriculture and allied services, and in informal sectors. Vocational training was introduced in ten States, covering over 2,400 schools and two Boards, benefitting over 250,000 students. Curricula are based on National Occupational Standards (NOS) and SSC certification. NSDC is working with 21 Universities and with Community Colleges under UGC/AICTE for alignment of education and training on NSQF. The Skill Development Management System (SDMS) covers 1,400 training partners, 28,179 training centres, 16,479 trainers, 20 job portals, 77 assessment agencies and 4,983 specialised assessors. Hosting of infrastructure certified by ISO 20000/27000 is supported by dedicated personnel.

Despite constant government efforts there is a gap between the target and achievements for several reasons. The major challenge is multi-agency collaboration for channelling time and resources. Another challenge could be scaling-up the existing target and bridging the gaps between jobs and workers with the potential skills.

## Q Case Study II. Green skills and eco-tourism

### Overview

The tourist industry, from the perspective of the green economy, requires sustainable tourism which addresses current and future economic, social and environmental impacts, along with the requirements of tourists, the industry, and the environment and host communities. Within the industry ecotourism is a component which ensures management of tourism and conservation of nature in such a way as to maintain a fine balance between the

requirements of tourism and ecology, on the one hand, and the needs of local communities for jobs, new skills, income-generating employment and enhanced status for women, on the other.<sup>20</sup>

In the global scenario India occupies a prime position in tourism among the world's Top 50 tourist destination countries.<sup>21</sup> In this context the capacity of the ecotourism industry in India generates large-scale employment opportunities, particularly in remote and underdeveloped areas. It offers enormous potential for highlighting natural resources such as landscapes, mountains, biodiversity areas, rivers and so forth for the benefit of people.

### Potential of the sector

The potential of the sector can be traced from the following facts:

Travel and tourism is the second highest foreign-exchange earner for India, and the government has given organisations in this industry export house status.<sup>22</sup>

The year 2016 witnessed a growth of 10.7 per cent in Foreign Tourist Arrivals (FTAs) in India. FTAs in 2016 totalled 8,890,000 (provisional) as compared to 8,030,000 FTAs in 2015. The Foreign Exchange Earnings (FEEs) from tourism in Rupee terms during 2016 were Rs.1,556,500 with a growth of 15.1 per cent (table or graph on this data with source).<sup>23</sup>

Table 7 reveals that the return on investment in tourism from the point of view of employment generation is much higher than for agriculture and the manufacturing sector.

**Table 7.**<sup>24</sup> Return on investment from the point of view of employment generation

| SECTOR               | RETURN ON INVESTMENT FROM THE POINT OF VIEW OF EMPLOYMENT GENERATION |
|----------------------|--|
| Tourism              | 47.5   |
| Agriculture          | 44.7   |
| Manufacturing        | 12.6   |
| Mining and quarrying | 2.6  |
| Railways             | 0.9  |
| Other transport      | 13.8   |

In India, the travel and tourism sector is estimated to create 78 jobs per million rupees of investment, compared to 45 jobs in the manufacturing sector for a similar investment.<sup>25</sup> With respect to ecotourism, India is known for its large ecosystems including the Himalayas and the Western Ghats. India has 661 protected areas with 100 national parks, 514 wildlife sanctuaries, 43 conservation reserves and four community reserves in different geographical zones, extending to nearly five per cent of the geographical area of the country. Studies show that in capitalising on these resources, ecotourism operations in India have substantially increased community participation (including women), involvement of indigenous groups, forest-dwelling communities, local-level resource-sharing with locally-designed frameworks, and the use of indigenous technologies.

### Government of India framework

Sustainable tourism practices in India are not new, bound together by the twin travel dicta of Bharat Darshan and Atithi Devo Bhavah, now known across the world through the medium of the Incredible India campaign.<sup>26</sup>

20 Abhishek Behl, Eco-Tourism or Wildlife Tourism, retrieved from <http://www.sanctuaryasia.com/resources/careers/2425-green-jobs-a-courses.html>.

21 Sajth, Evaluation of Ecotourism Resources in the Wetlands, July 2012, Vol. 5 No. 2.

22 Importance of Eco-Tourism in India, retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/19757/14/14\\_chapter3.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/19757/14/14_chapter3.pdf).

23 Ministry of Tourism, Government of India, Annual report 2016-17, retrieved from [http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%202016-17\\_English.pdf](http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%202016-17_English.pdf).

24 Central Statistical Organization (CSO) Enterprise, Ministry of Tourism, Government of India, retrieved from: [http://mospi.nic.in/?status=2&menu\\_id=92](http://mospi.nic.in/?status=2&menu_id=92).

25 Ministry of Tourism, Government of India, Sustainable Tourism for India, retrieved from <http://tourism.gov.in/sites/default/files/Other/Document.pdf>.

26 Ministry of Tourism, Government of India, Sustainable Tourism for India, retrieved from <http://tourism.gov.in/sites/default/files/Other/Document.pdf>.

## Skills for Green Jobs in India

The growing tourist demand is already exerting pressure on India's natural and other resources. Recognizing the importance of developing tourism in an ecologically-sustainable manner, the Ministry of Tourism has been laying a lot of stress on maintenance of environmental integrity. The Ministry of Tourism has evolved a **Comprehensive Sustainable Tourism Criteria (STCI)**<sup>27</sup> for major segments of the tourism industry, covering accommodation, tour operators, beaches, backwaters, lakes and river sectors for the entire country. The criteria were evolved after consultations with the various stakeholders. The Ministry entered into a Memorandum of Understanding (MoU) with the Eco-Tourism Society of India (ESOI) on 15 March 2016 to inform and educate tourism stakeholders of the importance of sustainable and responsible tourism practices and ensuring and promoting sustainable and responsible practices in the tourism industry.<sup>28</sup> Based on Ecotourism Policy and Guidelines developed by the Indian Ministry of Tourism in 1998, the Ministry of Environment and Forest in June 2011 called on State governments to frame ecotourism policies to facilitate tourism programmes in protected areas of the country. In addition, the Indian Government's 12<sup>th</sup> National Five Year Plan (2012-17) targets an increase in the net benefit of tourism activities to the poor, also emphasising that the revenue generated from tourism operations should be utilised for protected area management (India Tourism 2011).<sup>29</sup>

Trade opportunities and relevant employment options under ecotourism are broadly classified into two categories: ecotourism services and ecotourism enterprises. Ecotourism services include guiding and interpretation, sightseeing, destination cleaning, forest protection and antipoaching services.<sup>30</sup>

## Skills development mission and Ecotourism

The PM's Skill Development Mission enjoins the Ministry of Tourism and the industry to raise a skilled workforce of five million persons by the year 2022.<sup>31</sup> Hence it has been made mandatory for hotels to participate in the Skills Development initiative to meet the manpower needs of the tourism and hospitality industry. The amended guidelines for classification or re-classification of hotels require classified hotels to train a specific number of persons in every calendar year in the short duration skills development course under the "Hunar Se Rozgar Scheme".<sup>32</sup>

The Guides Training Programme for Regional Level Tourist Guides is an ongoing process which the Ministry conducts through the Indian Institute of Tourism & Travel Management (IITTM). The selection of Regional Level Tourist Guides (RLG) is based on the guidelines for the selection and granting of guide licences to the RLGs of this Ministry which have been in effect from 22 September 2011. There are 2,740 Regional Level Tourist Guides in India.<sup>33</sup> As of 31 December 2015 the Ministry of Tourism has approved organization of the Regional Level Guide Training Programme 2015. An estimated total of 912 seats have been created for this training course across India.<sup>34</sup> The training programme is of 26 weeks duration. The entrance test for the Regional Level Guide Training Programme 2015 was held on 3 July 2016.

27 R. Aluvala Promoting Eco-Tourism in India: Recent Initiatives, Millennial Workforce-A, 2017, p.9.

28 Ministry of Tourism, Government of India, Annual report 2016-17, retrieved from [http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17\\_English.pdf](http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17_English.pdf).

29 A. Biju Abraham, K Nagarajan, Alex K Thottunkel Ecotourism Economics and Environment, 2011, p.97.

30 Ecotourism in India, 1 September 2014, retrieved from <http://www.bagheerascamp.com/blog/?p=22>.

31 Annual report 2016-17 Ministry of Tourism, Government of India.

32 Annual report 2016-17 Ministry of Tourism, Government of India.

33 Ministry of Tourism, Government of India, Annual report 2016-17, retrieved from [http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17\\_English.pdf](http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17_English.pdf).

34 Ministry of Tourism, Government of India, Annual report 2016-17, retrieved from [http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17\\_English.pdf](http://tourism.gov.in/sites/default/files/annualreports/MoT%20Annual%20Report%2016-17_English.pdf).

## Skills training framework

### 1. National Institutes

#### Indian Institute of Tourism and Travel Management (IITM)

IITM is an autonomous organization of the Ministry of Tourism, Government of India, and is one of the premier institutes in the country offering education, training, research and consultancy in sustainable management of tourism, travel and other allied sectors. IITM endeavours to nurture professional and managerial excellence, social and cultural sensitivity, moral and ethical responsibility in relation to concern for the environment, and to strive for the latest techniques for developing decision-making abilities with a resolute approach to productivity, excellence, innovation and valuing of others to enable its participants to keep pace with the changing scenario of the economy and its environment.<sup>35</sup>

#### Ecotourism society of India

This society is dedicated to the promotion of sustainable development in tourism and of responsible best practices in and among the tourism fraternity. All funds and income generated are to be utilized for the promotion of the aims and objectives of the Society. It has formulated an **Ecotourism and environment handbook** under the Incredible India flagship programme.<sup>36</sup>

#### Centre for Environment Education:

CEE has been selected as an Implementing Partner for the Endogenous Tourism Project of the United Nations Development Programme (UNDP) and the Government of India's Ministry of Tourism in three sites in the North East: Kamalasagar (Tripura), Durgapur (Assam) and Sualkuchi (Assam). The goal is to promote local culture and craft-based eco-tourism for sustainable livelihoods and integrated rural development. CEE will be involved in training

and building up the capacity of youth in 'guiding' skills, interpretation skills, communication skills, and so forth. CEE will develop marketing support materials such as brochures, training charts and posters among other things, and also facilitate creation of village kala kendra (craft museums) and vishramsthals (rest houses) by developing panels, exhibitions and so forth.<sup>37</sup>

### 2. International Bodies

#### Global Sustainable Tourism Council (GSTC):

The GSTC is an independent not-for-profit organization pursuing the goals of promoting sustainable tourism knowledge and practices<sup>38</sup>At the core of its work are the Global Sustainable Tourism Criteria, a framework designed to ensure the sustainability of tourism businesses and destinations across the globe.

The **GSTC Sustainable Tourism Training Program** is designed to educate 15. Global Sustainable Tourism Council, retrieved from: <https://www.gstcouncil.org/gstc-criteria/>

travel and tourism professionals in key factors needed to integrate sustainability into a destination, business or organization. Highlights include discussion of current best practices, on-site tours and an in-depth look at GSTC Criteria and Indicators. The programme is facilitated by GSTC trainers, hand-picked by the GSTC for their extensive knowledge and experience. The first GSTC Sustainable Tourism Training Program was held at the Tadoba-Andhari Tiger Reserve, near Nagpur Maharashtra India. The three-day programme was attended by over 40 tourism professionals in the region. Attendees included Field Directors from all five of India's Project Tiger National Parks, Forest Service representatives, tourism board members and local ecolodge owners.

The programme included an in-depth look at the GSTC Criteria and Indicators for Tour Operators, Hotels and Destinations. Participants also visited an ecolodge adjacent to Tadoba-

<sup>35</sup> 13 Indian Institute of Tourism and Travel Management (IITM), Government of India, retrieved from: <http://iitmt.net/main/aboutus.htm>.

<sup>36</sup> Ecotourism Society of India, retrieved from: <http://www.ecotourismsocietyofindia.org/cms.asp?CatId=3>

<sup>37</sup> Centre for Environment Education, retrieved from: <http://www.ceeindia.org/cee/eco-tourism.html>.

<sup>38</sup> Global Sustainable Tourism Council, retrieved from: <https://www.gstcouncil.org/gstc-criteria/>.

**Table 8.** Table of courses

| COURSE NAME   | COURSE DURATION | COURSE DETAILS  | INSTITUTE OFFERING THE COURSE                        | WEBSITES   |
|---|-----------------|---|--|--|
| Eco- tourist Guide Training Programme for Madhya Pradesh Ecotourism Development Board | 12 weeks        | basic concept of Tourism, Eco-tourism and Tour Guiding<br><br>Improvement in soft skills<br><br>Field visits and trip to different eco-tourist destinations community resource scanning, guiding skills and dynamics of nature interpretation<br><br>Bird watching and wildlife interpretation.<br><br>Community-based ecotourism and their benefits: roving, map reading, camping, compass reading, walking tours, dynamics of trekking and photography techniques | IITTM, Gwalior                                       |  |
| M.Sc. in Eco-tourism  |                 | Eco-tourism planning and development, human conflict and wildlife conservation  | Sikkim Manipal University                            | <a href="http://www.ecology.edu/iiee/eco-tourism.htm">www.ecology.edu/iiee/eco-tourism.htm</a>       |
| Post-Graduate Diploma in Forest Management  |                 | Specialised module in Eco-tourism and Nature Conservation   | Indian Institute of Forest Management (IIFM, Bhopal) | <a href="http://www.iifm.ac.in/admission/coursestru.htm">www.iifm.ac.in/admission/coursestru.htm</a> |

Andhari Tiger Reserve. During this half-day field session participants were able to see and discuss examples of industry best practices.<sup>39</sup>

### 3. Courses/Projects/Programs:

There are very few courses focusing on ecological or nature-based tourism covering community, conflicts, impact assessment and visitor behaviour and attitudes in India. Some such courses are listed in the table overleaf.

With so much scope in this field, it is important for institutes in India to realise the importance of providing young travel professionals with proper educational opportunities. Eco-tourism can be an effective conservation tool if used wisely.

#### Endogenous Tourism Project:

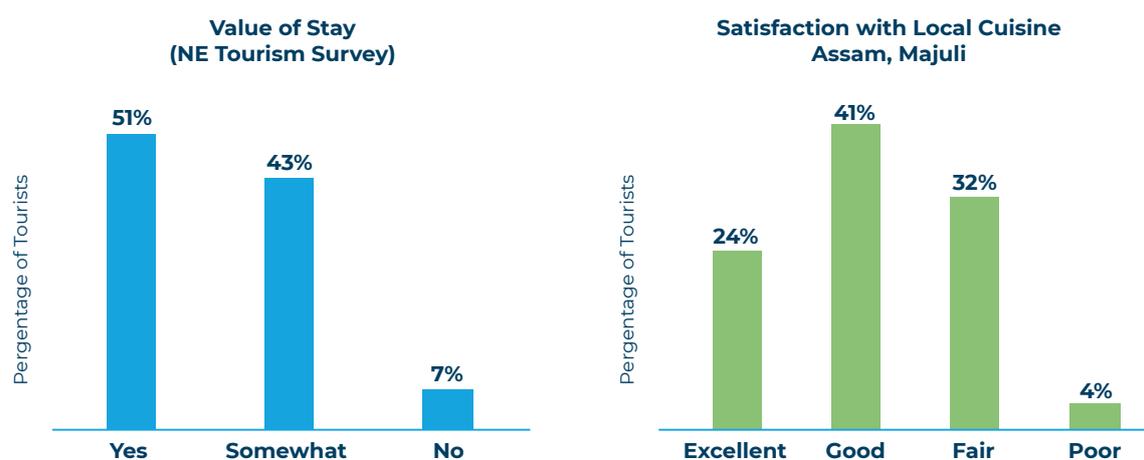
CEE implements its software activities in Sualkuchi, a weaving village in Kamrup district of

Assam that has been recognized by UNDP as the “Manchester of the East”. Sualkuchi, the largest village of Assam, is famous for its traditional handlooms and rich cultural heritage.

It offers a unique experience of silk-weaving practices from reeling right through to weaving. Thousands of visitors visit Sualkuchi every year. The aim of the project is to offer tourists a unique experience and give the community a sustainable livelihood in the form of tourism. Once the villagers are enabled to handle tourists, the project will be handed over to the Village Tourism Committee.

CEE focuses on building community institutions in the form of a Village Tourism Committee and to build up its capacity to handle tourists effectively. The tourism capacity-building programme includes aspects of networking, site marketing, hospitality, traditional local cuisines, interpretation skill and language skills. Since tourism in North-East India is a seasonal activity, the project also tries to develop community skills for diversified livelihoods. For this purpose CEE is

<sup>39</sup> 15. Global Sustainable Tourism Council, retrieved from: <https://www.gstcouncil.org/gstc-criteria/>.

**Figure 13.** Glimpse of tourist satisfaction index

Source: CSIR-NISTADS survey on north-east eco-tourism

promoting Self Help Groups (SHGs) and training them for diversified sustainable livelihoods; and it is engaged in reviving the traditional cultural heritage of the area to make up a package of dance forms, songs and traditional games unique to Assam.<sup>40</sup>

A recent study by one of the authors on tourism potential in the North-East reveals some interesting facts which highlight the need for skills development in the sector. The figure below, which relates to the tourists' satisfaction levels, clearly shows the scope for improvement and therefore the demand that exists for skilling.

## 6. Recommendations

The concept of green jobs and marketing has emerged in India and being supported by the Government of India's policy of skill development. With the introduction of the concept of green jobs there is a shift of traditional jobs to green jobs. Government of India has initiated multiple programs to gain an edge in the sector by exploiting the potential in the green jobs.

- ▶ There is a clear emergence of dedicated "Green Skilling" mechanism in India. Though several flagship programs emerge – their coherence needs to be in place.
- ▶ One of the recommendations of previous studies (Green Jobs 2010) was to update course curricula and align them on green skills needs. The academic institutes must design unique courses/diplomas in the area of Green Technologies. Continuous restructuring and updation of syllabi and curriculum of ITIs and polytechnics to suit to such new courses is required. Now the existing ITIs and Polytechnics are in the process of developing courses and curricula aligned on the emerging competency-based demand in the market.
- ▶ At higher technical/engineering education level, new programs in green technologies such as MTech/ PhD may be initiated. At present, there are very few programs like this in the country.
- ▶ The potential greening sectors based on the expert opinion are: (i) Renewables Energy – Solar, Biomass & Small Hydro; (ii) Agriculture; (iii) Construction; (iv) Automotive. India therefore has emerging sectors of green jobs, viz Green Construction, Automobiles, Renewable Energy, Waste Management and Water Management etc.
- ▶ A recent government initiative of creation of Skill Council for Green Jobs (SCGJ) is a positive development in this area. SCGJ is a joint initiative of Ministry of Power, Ministry of Skill development, Ministry of New and Renewable Energy and National Skill Development Corporation. There is a need to create new skill development centres for skill development in renewable & green technologies. Skill India must have separate renewable energy/ technology experts which at present is missing.
- ▶ Green technologies/solutions still largely remain import-oriented, and the backward linkages in these sectors are missing. A strong eco-system for green solutions is therefore required. At present it is limited to big cities and metropolitans. Skilled manpower needs to be made available in backward and poor areas.
- ▶ At present, the employability of renewable/ green technology experts is very less. We need to create more avenues of opportunities for successful induction of such skilled workforce into the system
- ▶ There remains a gender gap in the greening sector. Women participation remains considerably low. The policy for the green economy must incorporate tangible measures to curb these issues.
- ▶ There is a need to integrate Centre and State Government departments' working in the area of green jobs for effective implementation of the government policies to get desirable output.
- ▶ Policies should be inclusive irrespective of the economic status for enhancing green skills and knowledge. The measuring parameters for green skills and product designing must be more transparent.
- ▶ A proper assessment is required for green jobs value chain such that allocation on the trade-off between the demand and actual consumption could be identified in different sectors of the economy.
- ▶ There are a large number of unskilled workers in the market with different informal skill and knowledge in India. They should be encouraged for certification as per newly adapted certification mechanisms developed by Government of India. This would enhance

their employability and the industry would meet the desired standards.

- ▶ Since, India has a considerable share of young population so it will be imperative to attract youth for green jobs awareness using electronic and social media for making the youth more concern about the green environment and the need for green innovation.
- ▶ A centralized system should be developed for monitoring green jobs activities adopted by the implementing agencies. This would ensure evidence based decision support for green skill environment.

## 7. List of key resource persons

(interviewees, participants in the focus groups, expert panels etc.)

- Dr Praveen Saxena: CEO, Skill Council for Green Jobs (SCGJ);
- Dr P Goswami, Director, NISTADS;
- Mr Arpit Sharma: Head : Assessment & Assurance, SCGJ;
- Miss Geetika Chauhan: Head : Programs, SCGJ;
- Mr Tanmay Bishnoi: Head- Standards & Research, SCGJ;
- Dr Kasturi Mandal, Scientist, NISTADS;
- Mr Prasenjit Bose : Placements & Content Development, Automotive Skill Development Council (ASDC);
- Mr Sainath: Research & Programs, Agriculture Skill Council of India (ASCI);
- Dr Naresh Kumar, Scientist, NISTADS;
- Dr Sapna A Narula, Professor, TERI University;
- Mr Ramesh Chander: Deputy Manager, Construction Skill Development Council (CSDC);
- Mr B P Pant: Advisor, Federation of Indian Chambers of Commerce & Industry (FICCI);
- Dr Vipin Kumar, Scientist, NISTADS;
- Dr Saurabh Jain, TERI University;
- Miss Parisha Singh: Deputy Manager, All India Organisation of Employers;
- Miss Gagandeep Kaur: Consultant , National Skill Development Agency (NSDA);
- Dr Sanjib Pohit: Senior Fellow at NCAER;
- Dr Priyanka Kaushal, TERI University;



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