

## Creating Jobs with Renewable Energy in Rural India

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The COVID-19 pandemic has accentuated the challenges faced by India's rural populations due to a lack of access to reliable electrical connections. In 2019, 39,286 health sub-centers and 795 Primary Health Centers (PHCs) were operating without electricity.<sup>1</sup> Schools are unable to ensure access to digital education mandated by the National Education Policy (NEP) because of the lack of reliable electricity connections in many parts of the country.<sup>2</sup> Additionally, food processing units, dairy and poultry farms, and irrigation facilities have all suffered from poor electricity access.

Even before the COVID-19 pandemic, the lack of access to health and education services and livelihood opportunities in rural areas triggered migration to cities and towns, giving rise to urban India's informal job sector. During the COVID-19 pandemic, around forty million informal workers returned to their homes in rural India, having lost their jobs and livelihoods during the lockdowns.<sup>3</sup>

There is an urgent need to prioritize and rebuild the rural economy while ensuring access to reliable health and education services. The post-COVID situation provides an opportunity to embark on a more sustainable path by using cleaner energy sources, while also spurring socioeconomic development. Cleaner energy sources can meet the electricity demand from the health and education sectors and support income-generating activities. Such demand, combined with a rapid uptake of sustainable clean energy, can stimulate employment in the renewable energy (RE) sector for rural India.

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<sup>1</sup> Government of India Ministry of Health and Family Welfare Statistics Division, Rural Health Statistics 2018-29 (New Delhi: Government of India Ministry of Health and Family Welfare, 2019), [https://www.thehinducentre.com/resources/article31067514.ece/binary/Final%20RHS%202018-19\\_0-compressed.pdf](https://www.thehinducentre.com/resources/article31067514.ece/binary/Final%20RHS%202018-19_0-compressed.pdf).

<sup>2</sup> Government of India Ministry of Human Resource Development, National Education Policy 2020 (New Delhi: Government of India Ministry of Human Resource Development, 2020), [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf).

<sup>3</sup> Champa Patel, "COVID-19: The Hidden Majority in India's Migration Crisis," Chatham House Expert Comment, July 13, 2020, <https://www.chathamhouse.org/2020/07/covid-19-hidden-majority-indias-migration-crisis>.

## Potential for Renewable Energy Jobs

RE supply options are designed and developed based on the energy demand, including the type of demand and the time of day when electricity is required. Where supply from the grid is unreliable or not available, the systems may have to operate independent of the grid, or “off-grid.” The size of the system will vary depending on the number of loads and type of demand. For example, an individual household can rely on a 100-watt stand-alone Solar Home System (SHS) to power lights, fans, mobile chargers, and other essential appliances. An institution like a hospital or a high school will have more appliances and equipment that are drawing power, often on a more consistent basis throughout the day, than an individual household. These institutions require different configurations and battery backup options to ensure power availability even during extreme weather events or when the sun or wind are not available for solar and wind energy, respectively. In villages where there are multiple residential, commercial, and social loads, a micro-grid or a mini-grid powered by RE can provide electricity. In all cases, the source of RE will depend on the available resources in the village—solar, hydro, biomass, or a hybrid of these sources. Designing, implementing, and ensuring the continued operations of these systems requires human resources, thus creating jobs (Figure 1). Many of these jobs will be in rural areas with high RE demand, giving rise to an untapped and unexplored job market in rural India.



Figure 1: Project lifecycle of off-grid systems and micro-grids. Adapted from IRENA, 2012<sup>4</sup>

In Bangladesh, which has 5.8 million SHS—and the market is growing—the SHS workforce has created 137,400 jobs. In India, the off-grid RE sector employed around ninety-five thousand people across project life cycles.<sup>5</sup> This is not surprising since the RE dependence of Indian households is relatively low. As of September 2020, only three hundred thousand homes used off-grid SHSs to access a reliable source of electricity.<sup>6</sup> A

<sup>4</sup> International Renewable Energy Agency, *Renewable Energy Jobs & Access* (Abu Dhabi: International Renewable Energy Agency, 2012), [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2012/Renewable\\_Energy\\_Jobs\\_and\\_Access.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2012/Renewable_Energy_Jobs_and_Access.pdf).

<sup>5</sup> International Renewable Energy Agency, *Renewable Energy and Jobs – Annual Review 2020* (Abu Dhabi: International Renewable Energy Agency, 2020), <https://www.irena.org/publications/2020/Sep/Renewable-Energy-and-Jobs-Annual-Review-2020>.

<sup>6</sup> Rahul Nair, “Nearly 300,000 Households Electrified Through Off-Grid Solar Solutions: RK Singh,” Mercom India, September 22, 2020, <https://mercomindia.com/households-electrified-off-grid-solar/>.

survey conducted by Smart Power India and the National Institution for Transforming India Aayog (NITI) found that there is a high percentage of agricultural consumers (48 percent) and institutional consumers (22 percent) who rely on non-grid sources of electricity.<sup>7</sup> Of these, only 3 percent of agricultural consumers and 8 percent of institutional consumers rely on solar panels for electricity. The majority of consumers continue to rely on more expensive and polluting diesel generators as the primary source of electricity. This shows the urgent need to explore sustainable, reliable, and clean energy sources to fill existing gaps in the electricity sector.

But, as the India Energy Outlook 2021 highlights, India's policies have created a conducive environment for the uptake of solar pumps, SHS, mini-grids, and other off-grid and decentralized RE solutions.<sup>8</sup> With such a strong push for more RE, the sector will expand, and the number of potential RE jobs will increase at the grid and off-grid levels. But while the opportunity exists, India's rural communities are not yet equipped with the necessary skill sets to access such jobs.

### **Rural India Faces Barriers in Accessing Renewable Energy Jobs**

The skill sets required to work in the RE sector vary by type of job, location, and employment duration. Unskilled laborers perform tasks like laying foundation and brick work for the physical infrastructure for RE systems, tasks that do not require formal technical training and offer minimum wages. Semi-skilled laborers acquire their skill sets on the job and perform their role under the guidance of skilled laborers. This kind of labor is expected to be equipped with certification of completion of Grade 10 or Grade "10+2" and training in specific areas like plumbing or electrician courses. The skilled laborers often have the experience of working as apprentices or have completed formal training for employment in the sector. They are paid well and have skill sets that can help them develop their careers in the industry.<sup>9</sup>

The Indian government has been supporting the Industrial Training Institutes (ITI), National Institute of Solar Energy (NISE), and Skill Council for Green Jobs (SCGJ) to develop a curriculum and train youth for RE jobs. Similarly, private and social enterprises have been running skilling programs to prepare youth for semi-skilled and skilled jobs in the RE sector; but access to this training is not easy. An essential requirement to enroll in many of these courses is a graduation certificate from high school, equivalent

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<sup>7</sup> "NITI Aayog, Rockefeller Foundation & SmartPower India Launch Electricity Access & Utility Benchmarking Report," Government of India Press Information Bureau, October 28, 2020, <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1668185>; National Institution for Transforming India, *Electricity Access in India and Benchmarking Distribution Utilities* (New Delhi: National Institution for Transforming India (NITI Aayog); New York: The Rockefeller Foundation; New Delhi: SmartPower India, 2020), [https://smartpowerindia.org/media/WEB\\_SPI\\_Electrification\\_16.pdf](https://smartpowerindia.org/media/WEB_SPI_Electrification_16.pdf).

<sup>8</sup> International Energy Agency, "India Energy Outlook 2021" (Paris: International Energy Agency, 2021) <https://www.iea.org/reports/india-energy-outlook-2021>.

<sup>9</sup> Bharath Jairaj, Pamli Deka, Sarah Martin, and Seema Kumar, *Can Renewable Energy Jobs Help Reduce Poverty in India?* (Mumbai: World Resources Institute, 2017), <https://www.wri.org/publication/can-renewable-energy-jobs-help-reduce-poverty-india>.

to completion of Grade “10+2.” In some cases, training programs require even higher thresholds of educational qualifications, like a diploma from an ITI.<sup>10</sup> As a result, many unemployed individuals cannot access or apply for such courses. These requirements act as entry-level barriers for the vast majority of India’s rural population.

Yet the challenges they face are not limited to educational qualifications. Many also lack the necessary soft skills, like client negotiations and communications, to deal with customers and bankers. Training institutes find it challenging to run longer-term programs covering more skills due to limited funds. Another challenge is that training centers, like ITIs, are predominantly located in bigger towns and cities, making programs inaccessible or unaffordable for those who do not live there.<sup>11</sup> Research suggests that this factor is slowing down the inclusion of women in the training programs.<sup>12</sup> For example, reports indicate that some women find it difficult to leave their villages and households to attend the government’s flagship program Suryamitra, which is conducted over three months in a residential training center.<sup>13</sup> The Barefoot College model and SEWA’s (Self Employed Women’s Association) Hariyali program are some examples of successful training programs for women from very remote areas.<sup>14</sup> But these remain exceptions, and the vast majority of training options remain inaccessible to rural Indians.

Even after completing a training program, it is not easy to access RE jobs. Social dynamics like reliance on word of mouth and lack of knowledge about job platforms create challenges in applying for semi-skilled and skilled roles. There is a reliance on local subcontractors who recruit and manage the part-time contractual hires for the unskilled labor force. RE enterprises have also expressed concerns about the quality of training provided by training institutes and the need for necessary technical and soft skills required to perform the jobs they have on offer.<sup>15</sup>

Due to the persistence of these challenges, jobs accessible to rural communities are primarily for unskilled labor, and these are temporary roles. There is no investment in improving their skill sets, thus limiting their ability to find good jobs with reliable income, healthcare and safety benefits, and in-job training opportunities.<sup>16</sup> It is essential to address these challenges when building the RE job market to fuel socioeconomic development in rural India while employing rural communities.

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<sup>10</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

<sup>11</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

<sup>12</sup> International Renewable Energy Agency, Renewable Energy: A Gender Perspective (Abu Dhabi: International Renewable Energy Agency, 2019), [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA\\_Gender\\_perspective\\_2019.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Gender_perspective_2019.pdf).

<sup>13</sup> “About Suryamitra,” Suryamitra Skill Development Program, May 3, 2021, <https://suryamitra.nise.res.in/info/About-Suryamitra.html>

<sup>14</sup> “It Starts with the Sun,” Barefoot College International, May 3, 2021, <https://www.barefootcollege.org/solution/solar/>; Millennium Alliance and Shakti Sustainable Energy Foundation, Energy Access and Women’s Livelihoods (SEWA Bharat, 2016), <https://sewabharat.org/wp-content/uploads/2017/08/Final-Energy-Access-and-Womens-Livelihood.pdf>.

<sup>15</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

<sup>16</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

## **Conclusion: Creating a Conducive Environment for Youth Employment in the Renewable Energy Sector**

Training rural youth to empower them to access good jobs requires changes to training institutes' curricula and their approach to admissions. Training institutes must develop courses while keeping the previously discussed challenges in mind. Some have begun to make a difference by focusing, for example, on the candidates' willingness to work and learn, and not their educational qualifications for admitting them to training courses. A few others specifically seek to include candidates without the Grade "10+2" certification. Training institutes run by the government can consider developing such programs for semi-skilled labor.<sup>17</sup>

Training programs can also be designed in a manner to engage more women. The training facilities, including accommodation conditions, sanitation facilities, and safety aspects, must be considered while designing such programs. The Barefoot College's training program for women provides simple, yet significant lessons. The program targets women between thirty-five and fifty years from tribal areas to assemble, install, operate, and maintain SHS and small solar systems for community centers.<sup>18</sup> Over the years, Barefoot College has trained more than eighteen thousand women from India and other developing countries who have brought light to more than thirteen hundred villages globally.

To provide support to the training institutes that require investments to educate school and college dropouts and combine the technical skilling programs with soft skills training—corporate India can contribute through their Corporate Social Responsibility arms. Banking institutions can also support by providing loans at low-interest rates to students. For example, in Jharkhand, the Pan IIT Alumni Reach for India Foundation (PARFI) has teamed up with the National Bank for Agriculture and Rural Development (NABARD) to provide financial assistance to school dropouts from marginalized communities and has trained more than eighteen thousand youth since 2014.<sup>19</sup> Innovations in the funding model for the trainees and the training institutions that can reduce the costs for under-educated youth, and can help attract more people to such courses.

To improve the training programs' efficiency, RE enterprises can cooperate with training institutes to design programs and customize them. Where relevant, access to online job portals and tools to apply to jobs can be improved through partnerships between RE enterprises and the corporate sector.<sup>20</sup> Only when features such as providing access to under-educated youth, ensuring women's inclusion, and connecting trainees to financing and job platforms are embedded in training programs, can rural communities access

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<sup>17</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

<sup>18</sup> Smita Singh, "Solar Sahelis powering up women confidence: Barefoot College," CSR Box, January 30, 2020, [https://csrbox.org/Impact-stories\\_full\\_Solar-Sahelis-powering-up-women-confidence--Barefoot-College\\_190](https://csrbox.org/Impact-stories_full_Solar-Sahelis-powering-up-women-confidence--Barefoot-College_190).

<sup>19</sup> PanIIT Alumni Reach for India Foundation, accessed May 30, 2021, <https://paniitalumnifoundation.org/>.

<sup>20</sup> Jairaj et al., Can Renewable Energy Jobs Help Reduce Poverty in India?

these jobs. As previously mentioned, these jobs can be semi-skilled or skilled but must come with health benefits, safety nets, and growth opportunities.

With the job market expanding in tandem with the RE sector in rural India, the decentralized RE sector can potentially pave the path for creating such jobs that can provide stability and growth to the rural youth. With the RE enterprises' efforts, think tanks, and government skilling programs, such jobs will help in the long-term sustenance of RE interventions across the healthcare, education, and livelihood sectors. With improved access to healthcare and educational services, and income-generating livelihood opportunities, India can reduce migration to its cities and towns and strengthen its rural economy. Supporting the rural economy can go a long way in meeting India's Sustainable Development Goals (SDG) goals around poverty, health and wellbeing, education, gender equality, clean water and sanitation, affordable clean energy, decent work and economic growth, and climate action.

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