



Access to Energy

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EDITORIAL



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SEforALL people and SEforALL services

Governments world over delegate the responsibility of providing energy access to ministries of energy/renewable energy and rural electrification authorities/agencies, but despite their strong commitments, the world is not on track to meet the SDG7 goals by 2030. Energy access is beyond promoting clean energy or electrifying rural areas and hence, neither of these institutions and their priorities can address the last mile energy access challenges. The former set of institutions generally prioritise MW scale and central generation projects and the latter focus on extending the grid infrastructure to rural areas. The energy access central to the success of SDGs is not only about providing sustainable energy to all people on this earth, but providing sustainable energy for all services to all the people on this earth for their basic and productive needs with special emphasis on health, education and water supply.

Providing SE for all services to all people need dedicated and empowered country level institutions

(beyond ministries of renewable energy and rural electrification agencies) that have the resources to apply proven as well as innovative approaches towards meeting the energy access and SDG goals. Such institutions would provide a platform to pool-in all public and private funds for this purpose, including donor money, thus avoiding overlaps; will ring-fence the funds to ensure they are utilised for the intended purposes; will establish linkages and synergies with different developmental and sectoral schemes to maximise the demand and supply side impacts of energy access; will engage with private sector and with the community to facilitate delivery of energy services impactfully; will create data and evidence to improve decision making; and will put a robust monitoring system to be accountable to public.

The logic and reason for creating ministries of renewable energy and rural electrification agencies to provide a catalytic push to these sectors, needs to be applied for energy access as well. People without access to energy are the logic and reason to create energy access ministry/ agency or authority in high impact countries.

Renewables in the Caribbean



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ITPEnergised part of the rise of clean technologies looking to tackle the region's energy challenge

ITPEnergised are developing strong links in the Caribbean renewable energy industry with new and emerging opportunities across the sector. It is clear that the opportunities are abundant across the region, not only due to year-round solar resource, but much more across technologies including onshore and offshore wind, marine energy, bioenergy and waste. Given the number of island communities, there are also major opportunities to re-think and re-work grid networks to make them smarter and ready for an influx of new renewable energy generation.

Unfortunately, the scope of the challenge is just as diverse as the opportunity; from the need for basic energy access to be provided in some regions such as Haiti, where less than half of the population is connected to a power supply; to a complex and costly reliance on fossil fuels, with only one major producer in the region, Trinidad and Tobago, and increasingly unstable imports from markets such as Venezuela.

Other challenges include the need to upskill a new generation of renewable energy practitioners, the lack of a proven route to market for developers and financiers, and the need for stable and secure energy supplies to protect against disruption from major storms and hurricanes.

Although the challenges are complex, it is clear that renewables are the only option for creating a self-sustaining, reliable and of course environmentally friendly energy sector which can increase economic growth and improve social standards.

ITPEnergised has been analysing the threats and opportunities as part of our work to develop a Strategic Plan for the Caribbean Centre for Renewable Energy and Energy Efficiency (the CCREEE). The CCREEE's work will focus on making donor-supported programmes more effective, where they have the chance to provide the local knowledge and contacts to make external assistance work for those most in need in the region, as well as supporting the development of the private sector, research and development and capacity building.

We're also working with other new partners and projects in different parts of the region, including in Jamaica and Barbados. Our work ranges from feasibility studies for offshore wind projects to providing technical support to design new solar developments. Although for some of these projects, there is still a clear reliance on donor-funding, we're encouraged by the enthusiasm that developers in the region are beginning to show as the real potential for the industry becomes clear. We're also seeing more signs that politicians in the region are serious about making renewables work, underlined by the recent announcement by the Prime Minister of Jamaica, Andrew Holness, who has committed to transitioning to 50 percent renewable energy by 2030.

We are meeting many contacts interested in the market as possible to outline how we might be able to assist as our experience grows across the region. Part of these efforts include attending events in Manchester and Bristol, UK, in July, where we have been invited by the UK Government's Department for International Trade to meet with the Caribbean Development Bank and other businesses in the sector to explore how our expertise can further support the successful growth of renewable energy projects, with the ultimate aim of realising the huge potential and numerous benefits on offer to the region. If you are interested in exploring Renewables in the Caribbean, please contact us.

Application of Renewable Energy through costs-from-savings Case Study



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Project Description

The Public Authority for Water (PAW) formerly known as Public Authority of Electricity & Water (PAEW) is a governmental institution and the regulator for the water sector in Oman. PAW is also a direct water service provider, responsible for supplying potable water to homes and businesses except in few governorates. It operates around 1800 assets including reverse osmosis plants, pumping stations, booster pumping stations, wells/well fields as well as tanker filling stations and buildings throughout the country.

The energy costs for the operation of these assets represent a huge annual operational expenditure and is likely to increase as water demand is increasing country wide. Furthermore, the electricity bills are expected to increase significantly particularly during the summer peak load duration on account of the Cost Reflective Tariff (CRT) regulation issued by the Authority for Electricity Regulation (AER) in January 2017 and revised thereafter every year which are imposed on PAW's assets consuming more than 150 MWh/year.

PAW was interested in investigating the application of Renewable Energy (RE) through cost-from-savings by replacing high CRT and diesel costs in its energy-intensive assets.



Our Role

Based on the terms of reference, ITP India along with ITPE UK and SIE Oman was responsible, amongst others, for:

- Review of international experiences on RE applications and costs-from-savings
- Prioritization of sites, site visits to 18 PAW assets and selection of 10 sites for feasibility studies
- Development of methodology and accordingly conducting detailed technical and financial feasibility studies for 10 selected sites which included grid and off-grid solar PV grid plants.
- Development of implementation plan and bidding documents
- Organisation of knowledge transfer sessions in India and final workshop in Muscat, Oman
- Recommendations to PAW based on final workshop outcomes

The assignment delivered ten (10) reports and documents.

Project Details

1. Project duration: May 2018 to March 2019
2. Project location: Oman

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1. Public Authority of Water (PAW), Oman).

Migration and Climate Change



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Simply defined, human migration is the movement of people from one place to another, with the primary objective of resettlement, either on a temporary basis or permanently. Migration can be internal (within the country) as well as transnational (across an international border). Internal migration is often cited as a cause behind rising populations in cities, globally as well as in South Asia.

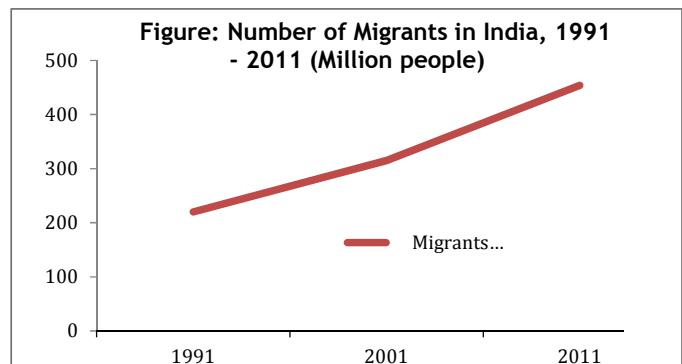
Over the past decade, climate change has been cited as one of the causes leading to migration. Climate induced migration can be a response to two climatic occurrences - extreme events (flood, drought and cyclone), or more gradual impacts such as shifts in rainfall and temperature patterns.

There are widely varying estimates for climate migrants. The Intergovernmental Panel on Climate Change (IPCC) estimated 25 million *environmental refugees* as of the mid-1990s¹, while estimates indicate that by 2050, number of climate migrants could reach 1 billion². The actual figure remains difficult to estimate, due to a number of factors such as the temporal nature of internal migrants (seasonal or annual, as opposed to permanent), distinguishing climate migrants from other reasons of migration and so on.

Climate Migration: India and South Asia

South Asian region is widely regarded as one of the global migration hotspots, along with other regions such as East and West Africa and Central America (Groundswell Report on Internal Migration, The World Bank³). The Government of India Census Report for 2001 estimated 315 million internal migrants. This increased to 454 million as per Census 2011.

For the sake of reference, this figure stood at 220 million as of 1991, thereby recording close to 100% increase in migrant population over the twenty-year period between 1991 and 2011⁴.



As of the present day, there are clearly observable trends of internal migration taking place from densely populated regions of eastern India (Bihar, West Bengal and Odisha) primarily to southern and western India. Migration from central India (Bundelkhand region in particular) to locations in north and west India is also well documented. Finally, there is continuous internal movement of people out of north eastern states of India (particularly Assam, Mizoram, Nagaland, Sikkim, Tripura and Meghalaya) to urban centres such as Delhi/ NCR, Bengaluru and Kolkata.

Climate Migration in Sunderbans - A Case Study

A deeper analysis of climate migration trends in the Sunderbans region of West Bengal⁵ reveal that there are two broad drivers pushing communities away from their home. The first is the spate of extreme events such as cyclonic storms (Aila in 2008 had the most devastating effect to the almost benign Fani in 2019) that render people homeless. The second is the gradual incursion of sea water in Sunderbans, due to partly sea level rise⁶ as well as siltation in the delta.

This, coupled with climatic factors such as delays and uncertainties in monsoon rains, leaves small

1 https://www.ipcc.ch/apps/njlite/srex/njlite_download.php?id=5866

2 <http://www.ipsnews.net/2017/08/climate-migrants-might-reach-one-billion-by-2050/>

3 <https://openknowledge.worldbank.org/handle/10986/29461>

4 Compiled from Census Reports 1991, 2001 and 2011

5 The author conducted a study in the region, supported by the Institute for Sustainable Communities, USA (2018)

6 <https://www.downtoearth.org.in/coverage/rising-sea-levels-and-tidal-erosion-eating-up-sunderbans-5361>

and marginal landowners with little to earn from agriculture, against rising aspirations fuelled by consumerism (Sunderbans is less than 100 km from Kolkata). These trends are exacerbated by difficulties in connectivity across myriad of islands and poor access to energy. As such, there is rising out-migration from Sunderbans region. This is accompanied by a steady rise in crime rates, as well as prostitution and trafficking.

Successful Adaptation to climate migration

The Groundswell Report of the World Bank argues that with successful adaptation strategies, the impact of climate change can be significantly addressed, which would in turn stymie the surge in migration. Going further, key livelihood threats as identified in areas affected by out-migration (people leaving) need to be addressed. In the Indian and South Asian contexts, the primary threats to livelihood occur from lack of sustained access to water for irrigation and other enabling factors such as energy. In coastal South Asia and the Delta region, salinity and salt water incursion are serious threats.

Addressing these threats shall stem the tide of migration, and convert permanent and long-term migration (over one year) to seasonal migration,

which is beneficial to the ecosystem for both zones (in-migration and out-migration), leading to higher incomes in both zones. For the case in point above (Sunderbans), the solution lies in securing livelihoods and making them more climate resilient on one hand, and taking steps in addressing soil salinity on the other.

Migration and State-level policy-making

Migration trends have prompted lawmakers to develop guidelines to facilitate migration. Recipient states understand the need for migrants as additions to workforce, while seeking to ensure that temporary migrants do not become permanent residents or add to existing problems of urbanisation and overcrowding in larger cities.

States such as Andhra Pradesh and Kerala have developed policies for migration. The case of Andhra Pradesh is especially interesting in light of the fact that Governments of Odisha and Andhra Pradesh have entered into a Memorandum of Understanding for protection of rights of Odisha migrant workers in Andhra. Kerala has drafted the Migrant Workers Welfare Scheme (2011) that protects migrants for a nominal fee, even covering for insurance in case of accidents at work.

Bio Solar Leaves: New Technology to Purify Air



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Over the last few years, a British Startup Arborea has focused on biotechnology and their benefits and have come out with a product called bio solar leaves. These leaves look like green solar panels as they are cultivated on a panelling system and are made up of a complex system of electronics mechanics and biotechnology to cultivate and harness photosynthesis out of living micro-organism. They are very adaptable and can be installed on rooftop of large commercial or industrial buildings or land or even on the side of buildings.



Source: Imperial College London

This innovative technology enables the growth of small plants such as microalgae, diatoms and phytoplankton on large solar panel like structures. These plants like any other photosynthetic organisms prepare their food using water, carbon dioxide and

sunlight for their survival and growth. They release breathable oxygen into the air in the process of preparing their food.



Source: Arborea

The bio solar leaves are developed so as to clean up the atmosphere from carbon dioxide and other air pollutants. Also, the developer of the technology has claimed that the rate of air cleaned by these leaves grown on panels that take the surface area of one

tree is same as the rate of air cleaned by 100 trees.

Besides a purified breathable oxygen, these leaves also produce organic biomass as a sustainable source. These can be used as food additives to improve the nutritional value of the food. Since microalgae uses only a fraction of water and land required for livestock and crops for its growth and has a fast rate of growth, it is being pushed as a food for the future. Countries like China, Korea and Japan use edible algae for centuries. Microalgae like spirulina and chlorella can be found as nutritional supplements.

Arborea has collaborated with the Imperial College London to test the technology outdoors and meet the challenge of pollution in the city with a sustainable solution. This will showcase the cleantech power at the White City Campus.

The above article is based on publicly available information

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