

BEST PRACTICES FOR TECHNOLOGY DIFFUSION IN DEVELOPING COUNTRIES: A CASE STUDY APPROACH FOR DIFFUSING ENERGY AND WATER BASED TECHNOLOGIES

Executive Summary

Approach and Scope

Currently, there is a considerable need to improve welfare conditions in developing countries, these range from serious health issues to environmental issues. These improvements can be efficiently implemented by diffusion of technologies. But the realities of a country's potential to adopt technologies is readily defined by a set of factors, namely political, financial, institutional, cultural educational level, and infrastructure. This paper will discuss the various barriers affecting dissemination of energy and water technologies in developing countries. Using case studies of previous attempts to diffuse technology in various countries, we will compile a list of lessons learnt. These lessons will be the backbone for conceptualising and proposing efficient best practices for policy-makers and technology designers to implement on future programmes.

Report Discussion

This report covers five case studies that discuss the diffusion of energy and water based technologies in developing countries, they are:

Dissemination of Clean-Burning Fuel Efficient Cook Stove in Sub-Saharan Africa and Central America:

About one third of the population rely on traditional use of biomass fuels in open fires in developing countries. The traditional method is proved to have adverse health effects and requires high wood consumption, resulting in 1.6 million death annually and increased amount of deforestations. Diffusion of new technology such as efficient burning cook stoves can reduce fuel consumption and address the health effects of indoor pollution. Many cook stove programs have been implemented worldwide but were usually not successful. Using lessons learnt from previously implemented programs, it was found that cultural norms, compatibility of technical parameters of stove with social expectation, and cost structure were the main factors that determine programme success. Also, the type of diffusion system implemented was crucial element for success as the use of decentralized bottom-up strategy showed to be more successful than centralized top-bottom strategy.

Adopting Wind Power Technologies in India:

Of the various sustainable energy alternatives which came up in the recent times, wind power seems to have a promising future. Within the past 40 years, a lot of breakthrough innovations took place which greatly improves the possibility of using Wind Power to generate electricity. Some of those technologies and their viability has been discussed. In a power crisis country like India with a 13% shortfall in power requires during peak hours, Implementing Wind Power Technologies is beneficial, although it has not been easy. Cumbersome government policies,

lack of financial backing coupled with infrastructure problems have hindered the growth of this market in India. However, the country has learned its mistakes and made huge policy changes in order to improve the conditions for wind technologies to prosper. Some recommendations to further improve this situation have been discussed in detail in the following report.

Adopting Solar Energy Technologies in India:

The impact of depletion in natural resources will have a huge impact especially on developing nations which are struggling with energy crisis. One alternative to energy derived by burning fossil fuels is Solar Energy. It is clean, sustainable, reliable and free except for the initial investment. It is easily adaptable and easy to set up making the initial requirements less and maintenance almost equal to none. This case study discusses the implementation of Solar Energy Technologies in a developing nation like India. It faced many problems ranging from lack of required data, land availability of establishing the plants, problems in paying off the already existing debts in power distribution sector and inability to attract investors. But the country handled all these and rose above to become one of the top 20 countries around the world to implement solar technologies. How it achieved this and recommendations to developing nations wishing to do the same have been discussed in detail in section 3.

Innovation in Power Sector in Nigeria:

Nigeria currently generates around 4,500mw of electricity which a great deficit as the country needs around 200,000mw to meet energy demands. This has led to business establishments and households employing generators and other sources for power generation, which are negatively affecting the economy. Although various reforms have been introduced over the years, none of them have had significant impact on the crisis. This is mainly due to the challenges faced including outdated technology and high price of fuel. This report studies the problems faced at present and based on this outlines some recommendations that can be carried out to meet present energy needs. The first step is to manage present technology effectively. Proper planning and organization of power distribution can help provide uninterrupted supply. Taking cue from other developing countries such as India and adopting their methods in Nigeria can also help ameliorate power deficit.

Innovation in Rain Water Harvesting and Waste Water Treatment Technologies in India:

India, a country with a population of 1.23 billion people, which is 16% of the global population, has access to only 4% of the world's fresh water. A majority of this population is settled in rural areas where natural sources such as rivers have been the only source of drinking water. Mandate rainwater-harvesting technology across the country to ensure drinking water supply needs to be done. This report highlights one such technology that has created a huge impact in South India. Successful implementation has managed to bring the State of Tamil Nadu in South India out of drought conditions. If the rest of the country follows suite then it won't be long before every citizen has access to clean drinking water. The report also discusses the importance of preventing deaths due to water borne diseases and cost effective methods to achieve this. How Policy makers can help people by providing facilities at highly subsidized rates and how successful implementation of both these technologies will definitely help change the entire water scenario in India has been discussed in Section 5