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## 8. Renewable Energy Sources: Remedies of Energy Crisis in India

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### Abstract

Energy crisis is the vital problem that the world faces in the present decade it is due to the continuous growth of population and energy consumption. It is very common in country like India where most of the population (over 40 %) has no access to modern energy product services on an average energy demand is expected to rise 7.4 % annually in the for next 25 % years. The present paper highlights the proper solution over the energy crisis in India which has proven as an ideal solution for the energy crisis. Researcher tries to attempt how renewable energy sources are stated its relevance during the time of energy crisis in India.

**Keywords:** Energy crisis, Renewable and non-renewable energy, Solar, Wind energy,

### Introduction

According to **International energy agency** (IEA) more than 28% share of the world total energy will be consumed in India and China by the year 2030 therefore a significant amount of energy must come from renewable energy sources. National action plan on climate change (NAPCC) was formed in 2008 for climate change controlled has also considered role of renewable energy in total energy production of India. NAPCC has also set a target to increase the renewable energy share in total energy production up to 15% till year 2020 which clearly shows India's commitment towards a sustainable development. the basic challenge is to fulfill the energy requirement is a sustainable way and one of the best available action is current scenario is renewable energy sources.

### Remedies of Non renewable energy in India

India is ranked fifth electricity generation capacity in the world. About 70% of India's electricity capacity from fossil fuel India is largely dependence on fossil fuel imports to meet its energy demand by 2030. India's dependency on energy imports is expected to exceed 53% of the country's total energy consumption. Fossil fuels based energy sources are not good to any country

its emit a high amount of toxic gases such as  $\text{NO}_x$ ,  $\text{CO}_x$  and  $\text{SO}_x$  gases which is ingenious to health and environment. These fossil fuels sources like Coal, Natural gas and oil etc.

**Coal:** Currently, coal is the main source of energy in India, 54% of total electricity generation is coal-based and more than 70% of the energy generated is from coal-based power plants. Although, India has the third highest reserve of coal in the world. There is still a great amount being imported every year. In 2013, 100 million tons of coal were imported from Indonesia. According to expert, an increase in consumption of coal is ineligible. According to **BP "Energy Outlook 2035" reports** India is expected to replace the united stets as the second largest coal consumer in 2024 (after china). By then, China and India must account for 63% and 29% respectively of global coal demand growth up to 2030. Coal is also hazardous and toxic to human beings and other living things (86) Coal ash contains the radioactive elements uranium and thorium. According to the **Clean Air Task Force still estimated that** "air pollution from coal-fired power plants account for more than 13,000prematuared deaths, 20,000hearth attacks, and 1.6 million lost workdays in the U.S. each year."

**Liquefied Natural Gas (LNG)** LNG plays an important part when we talk about the energy crisis in India .In march 2012, natural gas recourses in India were an estimated at 1330.26billion cubic meters. Since then, there has been a steady increase in the availability of natural gas, mostly due to indigenous discoveries of more reserves. India is currently the sixth largest liquefied Natural Gas (LNG) importer in the world and is expected to move up third place by 2020. Using the indigenous reserve will not only help supply power to India ,but its export would also help balance expenses of equivalent imports.

**Crude oil:** Along with coal LNG, crude oil is a major source in India. Oil is imported to supply all the needs that the others recourses are unable to respond. The combination of rising oil consumption and fairly unwavering production levels leaves India highly dependent on imports to meet its consumption needs. However, coal of petroleum products id one of the greatest problems in India's energy markets since they fluctuate every fortnight According to **planning commition, 2016-17** "India will manage an approximate 6.7million tones of oil and by 2021-22, this number will rise to 850million tones. Even so, this amount will meet only 70 % of the expected demand. Remaining 30 % will still be dependent on imports. So the renewable energy sources are the best solution of energy crisis in India.



### Current Situation of Renewable energy sources in India

India's renewable energy sector is amongst the world's most active players in renewable energy utilization, especially solar and wind electricity generation (86). As of June 2016, India had grid connected installed capacity of about 42.85 GW non-conventional renewable technologies-based electricity capacity, about 14.15% of its total, exceeding the capacity of major hydroelectric power for the first time in history. Since 2015 onwards the MNRE began laying down actionable plans for the renewable energy sector under its ambit to make a quantum jump, building in the country. (Annual report 2015-16.) MNRE renewable energy targets have been upscale to grow from just under 43GW in April 2016 to 175 GW from solar power, 60GW from wind power, 10GW from Bio power and 5GW from Small hydro. The ambitious target would see India quickly becoming one of the leading green energy producers in the world and surpassing numerous developed countries. The government intends to achieve 40% cumulative electric power capacity from non fossil fuel sources by 2030. Table 1 shows that grid interactive renewable electricity in India.

**Installed grid interactive renewable power capacity in India as of December 31, 2016 (RES MNRE)**

Source	Total Installed capacity (MW)	2022 Target( MW)
Wind	28700.44	60,000.00
Solar	9012.66	100,000.00
Biomass	7856.94	10,000.00
West-to-power	114.08	
Small Hydro Power	4333.85	5,000.00
Total	50017.97	175,000.00

Source: MNRE

The above figures refer to newer and fast developing renewable energy sources and are managed by the Ministry for New and Renewable Energy (MNRE). In addition as of Dec 31, 2016 India had 50,017.97 MW of installed large hydro capacity, which comes under the ambit of Ministry of Power.

In terms of meeting its ambitious 2022 targets, as of April 30, 2016, wind power was almost half way towards its goal, whilst solar power was below 7% of its highly ambitious target, although expansion is expected to be dramatic in the near future. Bio energy was also at just under half way towards its target whilst small hydro

### Wind power

Wind power accounts nearly 8.6% of India's total installed power generation capacity and generated 28,604 million (MU) in the fiscal year 2015-16 which is nearly 2.5% of total electricity generation. The capacity utilization factor is nearly 14% in the fiscal year 2015-16 (15% in 2014-15). 70% of wind generation is during the five months duration from May to September coinciding with Southwest monsoon duration.

As of 2015, Denmark generates 40% of its electric power from wind, and at least 83 other countries around the world are using wind power to supply their electric power grids. In 2014 global wind power capacity expanded 16% to 369,553 MW. Yearly wind energy production is also growing rapidly and has reached around 4% of worldwide electric power usage 11.4% in the EU. A 2008 study released by the U.S. Department of Energy noted that the capacity factor of new wind installations was increasing as the technology improves, and projected further improvements for future capacity factors. In 2010, the department estimated the capacity factor of new wind turbines in 2010 to be 45%. The annual average capacity factor for wind generation in the US has varied between 29.8% and 34.0% during the period 2010-2015

### Solar Power

Solar power in India is a fast-growing industry and as of 31 December 2016, the country's solar grid had a cumulative capacity of 9,012.66 megawatts (MW) or 9.01 gig watts (GW). In January 2015, the Indian government expanded its solar plans, targeting US\$100 billion of investment and 100 GW of solar capacity, including 40 GW's directly from rooftop solar, by 2022. The rapid growth in deployment of solar power is recorded and updated monthly on the Indian Government's Ministry of New and Renewable Energy website Large scale solar power deployment began only as recently as 2010, yet the ambitious targets would see India installing more than double that achieved by world leaders China or Germany in all of the period up to 2015 year end.

In January 2016, the Prime Minister of India, Narendra Modi, and the President of France, Mr. François Hollande laid the foundation stone for the headquarters of the International Solar Alliance (ISA) in Gwalpahari, Gurgaon. The ISA will focus on promoting and developing solar energy and solar products for countries lying wholly or partially between the Tropic of Cancer and the Tropic of Capricorn. The alliance of over 120 countries was announced at the Paris COP21 climate summit. One of the hopes of the ISA is that wider deployment will reduce



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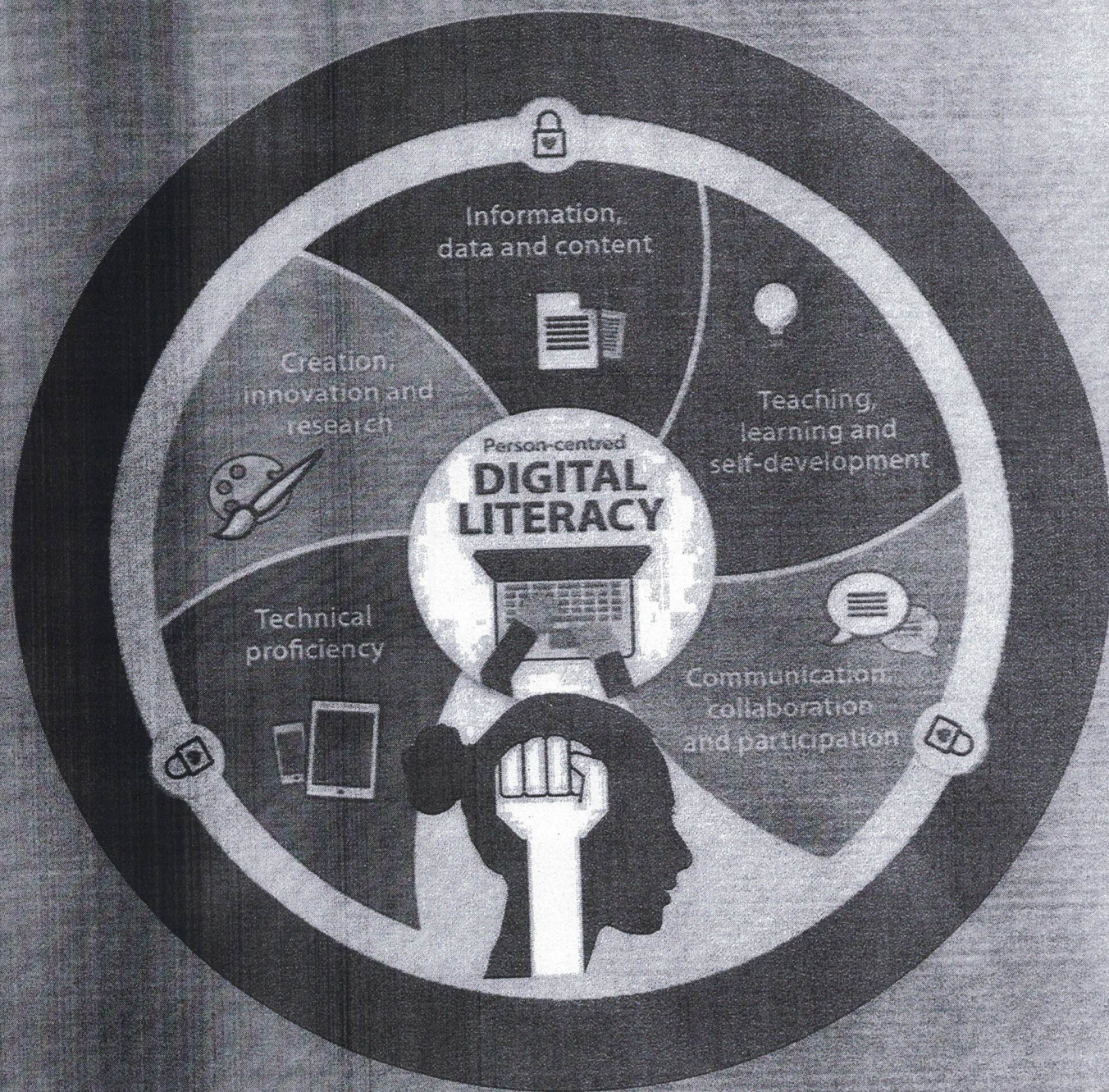
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# DIGITAL LITERACY AND WOMEN EMPOWERMENT



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## **The Role of women in Economic development**

**Dr. Jyoti Sahadev Wakode**

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and Commerce College, Sakri.

The Role of Women in the economy of India is increasing day by day. The position and status of women is an index of development and welfare of any society. Women have played a pivotal role in growing of the Indian Economy. Over the past decades, women have been working steadily, their talent, dedication and enthusiasm are forming the economic growth and prosperity in India. The present research paper focuses on the role of women in Indian Economy.

Women are undoubtedly the foundation of the basic unit of society. They demonstrate great innovation, skill, intelligence, hard work and commitment as we experience in society. Women in India make up 7.5% of the world total population (Chhibber, 2010). India ranks 113 out of 135 on the world Economic forum's Gender Gap Index. According to India's 2011 census, the sex ratio for children under six was 914 females against 1000 males the lowest since Independence in the provisional 2011 (Census 2011).

A report by McKinney Global Institute has estimated that, India could add \$770 billion to its GDP by 2025, Simply by giving equal opportunities to women. Yet, the present contribution of women to GDP remains at 18%.

Women are the equal partner in the process of development. According to Indian constitution, women have equal right with men. In today condition, women are increasingly empowered and they became strong enough than before. Traditional women used to stay at home and taking care of their children but now the situation is totally changed. Women Empowerment is an integral part of our development agenda as a result, the contribution of women in Indian economy is day by day increasing with speed.

### **Socio-economic Status :**

A country becomes progressive only when half of its population (women) get equal status. Women's contribution to the country's GDP is currently one of India's laborforces being female. But if even it only 50%



of women choose to join the workforce, then India's growth can scale from 1.5% to 9% a year.

India is a developing country our social economic education status is changing rapidly. In today's scenario, women have always been contributing to enable the economy achieve tremendous progress. A government of India study shows that more than 40 percent of rural women directly and indirectly contribute to the uplift of their families and thereby bringing social changes.

Women in rural India, despite suffering from the problem like health, malnutrition, lack of education and many other engage themselves in direct and allied agricultural activities run small shops, sell vegetables and handicraft products. They generate additional income for their family. In urban India, women despite of their education, facing lot of problem of shelter have been catering to social changes and grows their economic development as per their capacity. Women are growing their status in every sector of society.

### **Globalization**

The contribution of women in Indian economy is increased with the changing time. Globalization has opened up broader communication line and brought more companies and worldwide organization into India. They provide opportunities to Indian women who are becoming a large part of the work place, as a result the ratio of working women has grown and reflected in Indian economy. Education is are of another issue. It is the central process of sustainable development. Women started to take education which has been considered as empowering form education and its contents are vital instrument in not only in empowering the women but make the best economic opportunities. Education is one of the most important means of empowering women these have been realized and started to take it seriously.

The contribution of women in omnipresent in all sphere of life with growth in modern civilization. Government has realized the potential of women as contributors of economic growth and development. Women have come forward to establish as owner. The contribution of women to economic development is significant. For these, women need to pursue higher education, develop necessary skills, be ready to undertake risk, gain self-confidence, have effective coordination, possess leadership quality. To increase the involvement of women contribution equal opportunity to accelerate growth together. They must exhibit financial performance. Women are known to promote socially as well as economically.



## Digital **Conclusion –**

Indian women shape Indian economy. Economic Contribution is increasing day by day by women in today's generation. Economic empowerment increases women access to economic resources and opportunities. Mahatma Gandhi said, "If you educate a man, you educate an individual but if you educate a woman, you educate entire family women have ventured into all sectors which was denied historically to them. They started to prove them everywhere. They became successful in all sectors of society. There is active involvement in small and growing business. Still, there is long road for them to walk ahead for which she needs to be empowered.

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