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IMPROVEMENT POWER FAILURE AND PROTECT SUSTAINABILITY OF THE ENVIRONMENT IN BANGLADESH BY THE RENEWABLE ENERGY: REVIEW

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ABSTRACT: *Developing countries are without compromising the environment, environmentally friendly, economic development of Bangladesh is a burning issue and requires a large supply of power. The use of fossil fuels is limited, solar, wind; biomass renewable energy sources such as hydro power limit option might be compensated for the other countries of similar power crisis in Bangladesh are not separated. From the power supply grid connected through three quarters (76%) of the people of Bangladesh. No doubt it is natural gas that has been limited to using a variety of purposes. Mean energy demand alarm output gap is expected to increase exponentially. Despite expectations that renewable energy sources are now in this country, you only have a 0.3% share of renewable energy in the total energy supply. In this article, not only, however, for future use in Bangladesh and the state of renewable energy that can be obtained in Bangladesh to review the renewable energy technologies. It will also try to show that the direction of future research, the use of renewable energy to meet future needs.*

KEYWORD: Electricity generation, Fossil fuel, Renewable energy, Sustainability, Bangladesh

INTRODUCTION

The presence of gold fossil fuel energy sources in some cases, luxury consumers in general, due to high demand, will be out in a few decades. Oil, gas, coal, commonly referred to as fossil fuels world power will increase the geometric mean of 1973 to 5.6% for the in terms of growth for its energy needs. It is expected of the three aging rapidly in 2010, India and the rate at which both have about 50 percent of China in the world (External) maximum power. Supplies needed in 2035 for the navel. It is a fast-paced industry and increased energy economy in developing countries is similar to optical interference (Figure 1). However, the country's largest oil importer in the industry and 10 years. , The United States increased as expected to reduce oil imports by 2035 phased induction of domestic exports and fuel transportation system effective there, on the contrary, China is a net oil importer. the biggest 2020 In 2010, about 81.1 percent of all primary energy used to clean nu- eliminate fossil fuel energy sources such as biofuels, water (Figure 2) according to 2.1973 figs. The proportion of energy for all is 86.7% more than three times the stock fell 5.6%, while 57.7% of global energy Tran's ownership transport, which means that concern for policy makers. In the survey, it is possible to achieve an alternative course and continuous improvement -ergative sustainable development without affecting future demand is the key to lasting. Energy is meet modern requirements for energy efficiency. If this requirement is clearly see our definition "to meet their needs without compromising the ability of future generations to evolve to meet the needs of the present." countries such as to maintain a sustainable, in other words, without affecting the needs of future generations to meet their current needs. Open views of renewable resources to maintain an adequate, environmentally friendly solution which aims to secure energy However, the

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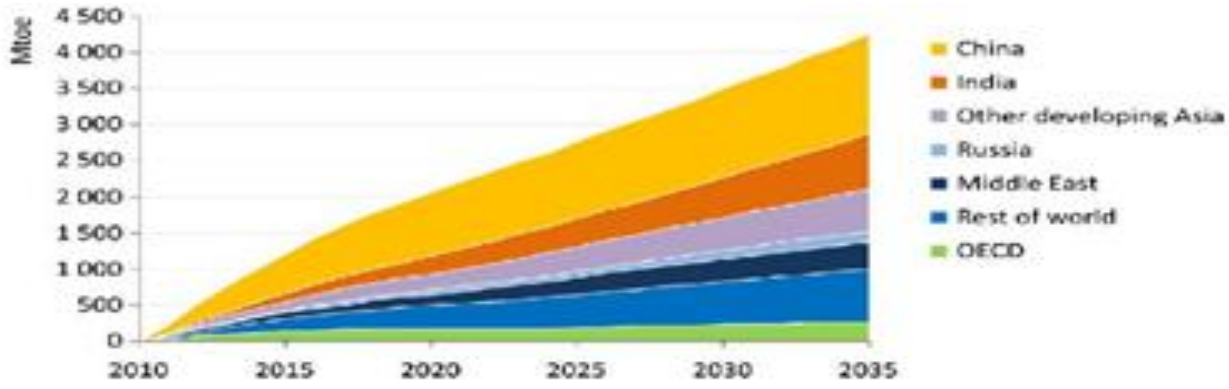
development of developing countries, and the window of opportunity is a renewable source. a. Currently, approximately 18% of renewable energy worldwide is composed. Once the source has been used to divert their energy mix - biomass. Biofuels, solar, hydroelectric plants are electricity (Fig. 3) As such; the current China reached a new record of US $ 257 billion in 2011 and is the country's largest oil imports investment. Renewable energy technologies, such as large, are growing 17% from the player of the year. Energy may, encouraging to note the global investment involved, Germany, USA, India, higher than what has been invested in the Italian record Americans $ 51000000000 and coal, gas in terms of leverage. Traditional energy sources are such as nuclear power in China also creates the forefront of renewable energy sources. It is possible that more than 550 billion kWh in 2035 (Figure 4) A similar pattern of high investment, especially in new areas of developing countries. However, the rate is decline.

Fig. 1. Growth of primary energy demand. (Source: World Energy Outlook 2012: in-depth study on energy-efficiency© OECD/IEA 2012).



Renewable energy sources are becoming more sought after, with low CO2 emissions; they can provide eco-efficient. Solution for the developed countries and developing the European Union (EU) will generate 71 percent of its electricity from renewable sources .Developing countries also focuses on the use of solar, wind and biomass. Hydropower is taking advantage of a favorable geographic location. But there is still a lack of education will be sufficient Plan of biomass is expected to have a 13 percent share of renewable energy as well, which is evident in the development of agriculture, according to the Power Grid connection. Very inadequate or non-existent, and in particular, the majority of the population, even in times as high as 80 percent live below the poverty line. Market opportunities and develop new business in this sector could lead to the creation of income, and higher economic growth, particularly in developing countries It seems that policy measures. Conducted by government and non-governmental organizations in Bangladesh are on the road ahead substitute energy drive in Bangladesh. Therefore, more research needs to be done to expand public-private partnerships to implement the policy.

In this paper, first we will discuss about Bangladesh, we will provide a broad brush in other developing countries with the same field, such as Bangladesh. Thus, we assume neigh boring countries such as Pakistan, India and Nepal. Until May 2011, Pakistan was the lack of power of 700 MW Pakistan dependent on fossil fuels, nuclear power and renewable energy to import liquefied natural gas from Iran, Qatar, and Turkmenistan. Africa could be one option for

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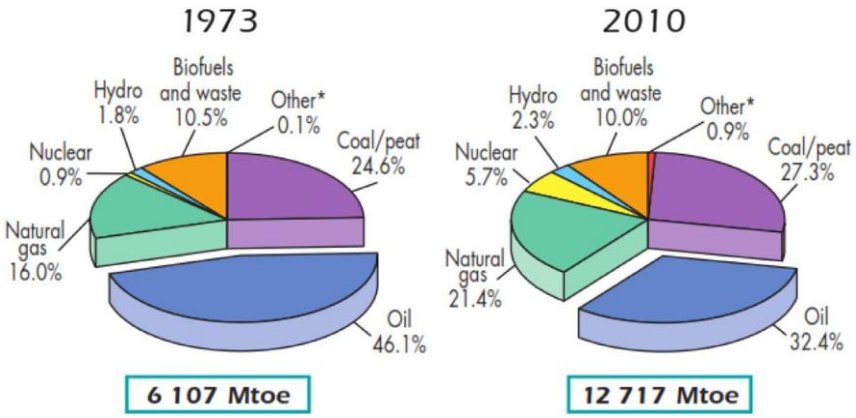
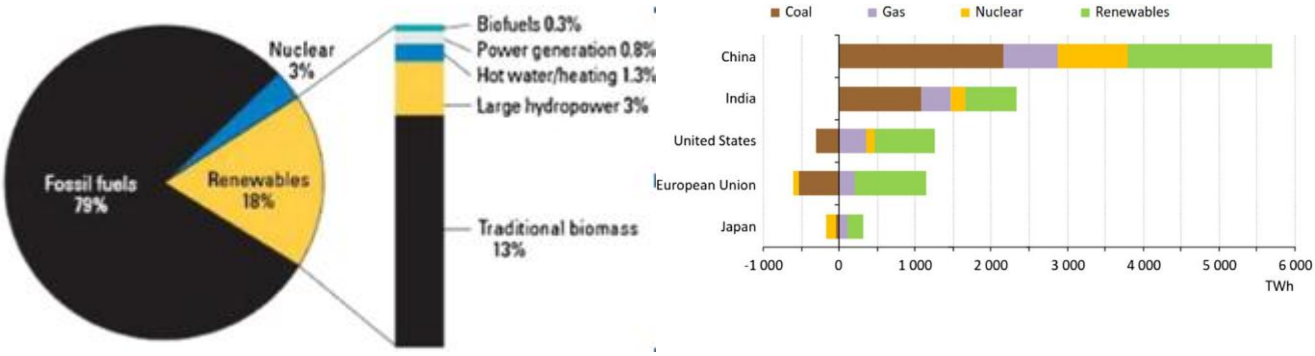
Pakistan. And then the rest can be filled with the use of renewable energy. Nepal is basically dependent on fossil fuels Currently, Nepal, the use of various types of renewable energy sources, this- biofuels, biogas, biomass and small hydro no logy Pico Technology, Water Mill, better technology. Solar thermal technology, solar and wind energy of all this is the dominant mode of biomass technology. The case of India is different from Nepal and Pakistan.

Fig. 2. World fuel share of total primary energy share. (Source: Key World Energy Statistics© OECD/IEA 2012).



India is a country with high population with limited resources, nearly 400 million people in India do not have access to electricity India has coal reserves of good quality, not easily accessible, in this case. Unwise to Bangladesh is import electricity from its neighbors. Such as India, Bangladesh has a large population, and unlike India, it has a smaller GDP. To overcome the energy boiling should seek other alternative renewable energy can be one of the alternatives to overcome the energy crisis in some degree.

Fig. 3. Renewable energy share of global final energy consumption Fig. 4. Change in power generation, 2010e2035. (Source: World Energy Outlook 2012© OECD/IEA 2012).(Source: World Energy Outlook 2008© OECD/IEA 2008).



Location and energy status

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Bangladesh is located in South Asia is estimated. 154700000 population and growth rate of 6.2 percent of GDP in 2012. Most of the country is flat with some mountainous areas in the southeast. Discover the natural resources of Bangladesh, among others, include natural gas, coal (mostly) and Hydropower Co., Ltd. This will be used as a source of energy to generate electricity. and operation of the natural gas industry is a major contributor (82.1%) for the production of electricity in the country In 2011, among other fossil fuels imported fuel oil, coal, diesel and hydropower are involved. to supply electricity to the tune of 5.6%, 2.4%, 6.9% and 2.8%, respectively In addition, the power plant located in Barapukuria is to generate 250 megawatts of installed capacity at this time channels. energy gap between demand and clear in terms of electricity production As mentioned above, Bangladesh is currently facing a severe energy crisis. Now, when compared with the needs of the low supply of more than 6,000 MW, 8350 MW with the loss of critical systems this is the loss of the system means the sum of all the energy that is lost.

In Bangladesh, nearly all (98.5%) of the installed capacity of electricity is generation from fossil fuels, while the share of renewable energy is only 0.3 percent. A gas 23 is a book on the subject. 566 336 900 000 cubic feet (TCF) could be exhausted within the next 15 years .The book is about 3.015 billion metric tons of carbon have recently discovered reserves has been verified coal reserves of natural gas equivalent. on 2900000000 metric is expected to be very expensive coal mining. In addition, the widespread use of coal to generate electricity in power plants in danger of the most densely populated environment through emissions of CO2, the exploration and exploitation of renewable energy sources can provide a source. Sustainable energy will reduce Green House Gas (GHG) and a negative impact on the environment.

In fact, demand for electricity is increasing rapidly, there is also the production of electricity be confidently canceled. This model is mainly based on gas power plants, which are not sufficient to meet current needs. Moreover, the only way to generate electricity from coal, Hydropower and remote control of renewable energy is very low. The Government of Bangladesh (GOB) is planning to generate electricity, 5,000 MW in 2011 and 7,000 MW by 2013. The initiative is the establishment of coal and fuel oil power plant in Khulna and Chittagong Region it. You can add 7919 megawatts to the national grid in 2013, as a matter of fact; an initiative of the Government of Bolivia has greatly reduced energy shortages, although GOB should do it in a pan. Both public and private, this is taken to produce electricity coverage.

In fact, the total investment cannot come from the government alone In 2011, 31.355 billion kilowatt hours, the share of gas, oil, hydropower and coal are used produced is 82.1. 12.1 Respectively 2.8 and 2.5 percent. The creation of trends and the use of electricity in Bangladesh are given in Table 1.Transmission system overseen by the government's own company of Bolivia Body Power Grid Co. (PGCL) Established in 1996, the power generated will be sent to the national grid through transmission lines of 230 kV and 132 kV with a length of 8,500 kilometers in a year. 2011. This extension was made and the total length, reaching 8662 km total length of 2,200 km transmission line extending from 2007-4200 km in 2010 with an increase in distribution since 2011. 12 million people have connected more than expected 278,000 miles of distribution lines that will connect 80,000 customers per year 3E4, but the load flow, often caused by the volatility of the power and demand. Loss System is one of the major constraints in electricity production, the loss decreased from 12.2 to 12.0 percent system in 2013. In the Southwestern Company Limited (WZPDCL) was established in 2002 in partnership with (BPDB) Company of Bangladesh Power Development Board (BPDB and WZPDCL) operating in the metropolitan area Division Faridpur, Dhaka Khulna and Barisal.

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To increase capacity and to ensure that the revenue performance in the capital Dhaka, Dhaka Electric Supply Company Limited (DESCO), founded in 1996 as a subsidiary of the Department of Electrical Dhaka (DESA) of Dhaka. Power Distribution Company Limited (DPDC), founded in 2008, which is the largest energy company in the United States this attributions. Built in 1994 under the Companies Commission Act as part of the Bolivian government reform policies Rural Electrification Board (REB), founded in 1977, which is a semi-autonomous agency of the Ministry of Power, Energy and Mineral Resources (MPEMR) since the beginning. It has been working in rural areas of Bangladesh to facilitate the production of electricity for the manufacturing sector - agricultural and strengthen the social and economic development of the rural population Bangladesh to develop. Energy Board (BPDB) was established as part of structural reforms by GOB power quality for sustainable energy contribution diseases in Bangladesh However, without more natural. Electricity involves the community through the use of renewable energy sources and institutions, these efforts will continue to be less effective than desired. Therefore, the purpose of this study was to evaluate the potential of renewable energy that can guarantee sustainable development and environmental conservation in Bangladesh.

Energy information of Bangladesh

Energy consumption per capita of Bangladesh is very low. The value of the energy consumption of 2008 was approximately 250 kg OE compared to the world average in 1680 kg OE. Total primary energy consumption of 2008 has been estimated as the mix of energy consumption and was one million tons 33.50 oil equivalent: in indigenous biomass 62%, natural gas 25% of the original, 12% of oil imports, imported coal and hydropower I combine to 1%. In rural areas, two thirds of the country's population level from traditional biomass fuel (domestic commercial, industrial) meets most of their energy demand. A variety of marketing company under the nationwide kerosene and diesel distribution Bangladesh Petroleum Corporation (BPC) in a uniform tariff rate the government has set. Frequent power outages, voltage fluctuations and supply reliability is low, unstable: while only 22% of the very poor quality of service of power supply in rural areas in rural areas, about 32%, access to electricity the I have. Biomass, currently, the only non-renewable native total primary energy consumption of Bangladesh of energy source, has been a major contribution to about 60% of the gas .Natural, which is produced continuously, since 1970 was consumed in significant amount of gas, the main source commercial energy plays an important role in Bangladesh's economic growth. The main consumer of gas, respectively accounted for 46.65 percent and 21.71 percent, (using the gas as a raw material) power and fertilizer in the department.

Fossil fuel

Natural Gas: Bangladesh gas sector started its journey in the 1960s, but its rapid expansion and integration and integration started to accelerate in the early 1970s spurred by the rising oil prices. Until now, 24 gas fields have been discovered. Natural gas fills about 75% of the total fuel consumption of the country. The oil and natural gas market is primarily operated by the Bangladesh Oil, Gas and Mineral Corporation which holds the shares of all state-owned companies involved in oil and gas production and exploration, and the Bangladesh Petroleum Corporation , responsible for the refining, distribution and import of crude oil and petroleum products. Because of the increasing demand of gas, the exploration of new gas field and the development of the discovered gas fields are very important. During the financial year 2011-

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12, a total of 29 projects are being implemented by Petro Bangla and its companies in the oil, gas and mineral sector.

Coal: According to the present development data, the coal fields in Bangladesh are divided into five coal fields, all of which occur in the northwestern area that is sandwiched between the Jamuna River and the Padoma River in northwestern Bangladesh. At present, foreign companies, including Indian and South Korean companies, are aggressively engaged in coal development in the country. In particular, since Godwin coal is a kind coke of good quality with limited global availability, it has drawn much attention from concerned parties in many parts of the world.

Electricity: The Bangladesh Power Development Board (BPDB, www.bpdb.gov.bd) was created in 1972, a public sector organization. The Rural Electrification Board (REB) was established in 1977, as the semi-autonomous government agency .As Dhaka grew in population and became a metropolitan city, the need for its own electricity grid, led to the creation of the Dhaka Electric Supply Authority (DESA) in 1991. It was implemented to operate and develop the distribution system and bring improvements in customer service, revenue collection and lessen the administrative burden of BPDB. Tthe Dhaka Power Distribution Company Ltd. (DPDCL, www.dpdc.org.bd) took over DESA activities in 2008 as part of an overall power sector reform, to unite the energy system, and produce a more Competitive, reliable and efficient system. The Power Grid Company of Bangladesh (PGCB, www.pgcb.org.bd) was created in 1996 to own, operate and expand the national power grid. In 2003, PGCB completed the takeover and began the operation all the transmission assets of BPDB and DESA. The PGCB is a public limited company, and is 76.25 % owned by BPDB, the remaining 23.75% is owned by the general public. The creation of the Dhaka Electric Supply Company was also part of the reforms. It is a public sector company, and a subsidiary of DESA. However, in the future, its shares will be offered to other power sector entities and the general public. The REB has 70 operating rural electric cooperatives called Palli Bidyuit Samity (PBS). These cover more than 90% of the area for rural electrification. These cooperatives bring service to approximately 7,200,000 new connections, and are constructing more than 14,000 km of new transmission and distribution lines each year.

Renewable energy

Low income developing countries like Bangladesh are very much susceptible to the setbacks arising from the on-going energy crisis. Natural gas lies at the heart of the country's energy usage, accounting for around 72% of the total commercial energy consumption and 81.72% of the total electricity generated. Such an overwhelming dependence on bio fuel has brought into focus the substantial amount of renewable energy resources available in the country. The potential non-exhaustive sources of energies, available in the form solar, biomass, biogas, hydropower and wind, can be harnessed to provide an environmentally sustainable energy security, as well as affordable power supply to the off-grid rural areas of the country. To this end, effective utilization of renewable energy resources has been adopted as a policy of the Government of Bangladesh (GOB). Different government, semi - government and non-government organizations (NGOs) have been working separately or jointly to disseminate renewable energy technologies (RET) throughout the country over a significant period. At present, the different categories of renewable energy that are being used in limited ways in Bangladesh are solar, wind, hydro, waste bio-gas, and biomass gasification.

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Hydroelectricity: The Karnafuly Hydro Power Station is the only hydropower pl ant in the country with a capacity of 230 MW. It is operated by BPDB (Bangladesh Power Development Board). BPDB is considering increasing production up to 330MW.

Biomass: Bangladesh is an agricultural country so biomass is available in huge amount. Cattle dun g, agricultural residue, poultry dropping, water hyacinth, rice husk etc. used for biomass power generation are available in Bangladesh.

Biogas: Biogas production plays an important role in Bangladesh since the necessary resources are plentiful. The Government along with several NGOs is working together for development of power production from Biogas. Grameen Shakti is one of the most uttered NGO in field of biogas and have completed several works.

Solar Energy: Infrastructure Development Company limited (IDCOL) has supported NGOs in installing solar home systems (SHSs); a total of 1,320,965 SHSs having capacity of approximately 36.5 MW have been installed up to February 2012.

Wind: Bangladesh is in the midst of a severe energy and power supply crisis; one of the worst in South Asia. However, the government is now looking to explore the potential of wind energy, particularly along the country's 724 km long coastline. Wind energy can potentially generate more than 2000 megawatts of electricity in the coastal regions. The growth of wind energy in the underdeveloped, coastal areas of the country holds hope for poor, isolated communities that are not connected to the national electricity grid and who are also unlikely to receive grid connection in the near future due to the high cost of establishing infrastructure, and growing scarcity of traditional energy inputs. The Bangladesh Power Development Board has estimated that wind energy can contribute to 10% of the energy needs of the country. The Board has also calculated the cost to generate one kWh from wind energy to be about half the cost of generating an equivalent unit of power from solar energy. The expansion of the potential of wind energy will be crucial in order for Bangladesh to achieve its national vision of providing electricity to all of its population by 2020.

Government initiatives promoting renewable technologies

Recognize the difference between supply and demand. The main source of energy in Bangladesh conclusions can. Drawing an over-reliance on natural gas is clear. Full risk for electricity and for other business operations is serious efforts to find out the potential economic, social and ecological. Application of alternative energy sources In this regard, a number of initiatives dealing with the UN GOB to generate renewable energy. It GOB energy policy alternative replacement formula in 2008 and is part of a policy to engage with partners. the development and the private sector to increase the generation in order to implement this policy GOB took the initiative as follows.

1. Institutional Arrangements by deploying Sustainable Energy Development Agency (SEDA). Its responsibilities include coordination, planning, promoting awareness, supporting the establishment of small and medium renewable energy enterprises and service providers, providing financial support in research and soliciting of grid connected renewable energy projects.
2. In conjunction with the GOB, SEDA will determine the priorities for the renewable technology development. SEDA will support capacity building, human resource and market development.

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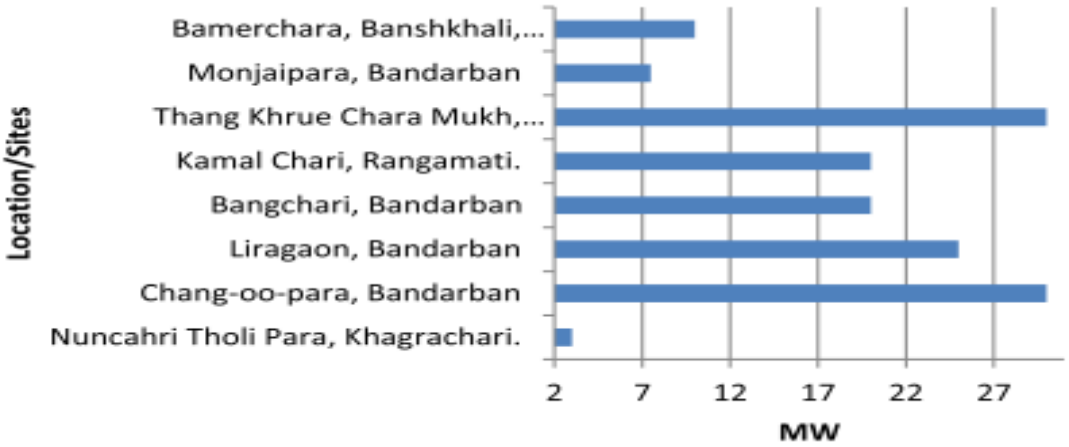
3. Investments will be expanded. Microcredit support will be established in the rural areas to purchase renewable energy equipment. Private sector participation and joint venture programs will be encouraged

4. Implementing the regulatory policies to distribute renewable energy.

Fig.5. Selected potential sites for micro power generation.



Renewable Energy Policy 08 states in 2021 and 20.2030 shares of renewable energy like 5 percent and 10 percent, respectively, the national requirements. This will involve the participation of aspect also all this mean for businesses in this sector are not supported in the end will lead to economic growth and a lot of people. Entrepreneur has involved in the renewable energy sector. But it is necessary for the comprehensive support from the government and private sectors. Intervention is partnership development and strengthening of technology transfer. Many initiatives from both the public and private sector efforts to past shows (Table 1) .both public and private sectors to work with development partners involved in the use of solar energy and promotion. Offers Long as the electricity network since 1996 has been SHS has MINI developed with the help of the French government; Approximately 90,000 units have been installed in various parts of the country a power supply is not available. In addition is supporting the development of the French government. Infrastructure Limited (IDCOL) are also involved in the IDCOL is the NBFIs GOB (Fig. 6) Alliance private partnership along with development partners synchronization action now by IDCOL powered RET implementation. In renewable energy sources are different (Figure 7), the main issues and activities of this organization is to provide financial support for the project to provide infrastructural development. Large and small in Bangladesh the company is premier leader in Bangladesh, the energy, the development of private equity actors IDCOL and infrastructural $ 11,100,000 from current donors and development partners. Among its partners are IDCOL its funding Society for International Development (IDA), 161 million US dollars, German Financial Cooperation (GIZ) formerly GTZ for Euro 24.50 million baht 14900000 € recognized by the Organization of the Netherlands. (SNV), the German state Bank (KFW) y. Other adult partner is in the development of biogas. A parte this development partners, the Asian Development Bank (ADB) will provide US $ 165 million baht projects. These comments funding opportunities for renewable energy have access IDCOL addition of ADB funds for renewable energy projects in developing countries, Bangladesh, about 50 MW of projects. Installed capacity has been set at 45 MW from the current level of SHS Sigel development

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activities can work. Full potential 260 megawatts from solar and wind power will be involved in energy where 25 MW and 235 MW of wind.

Table 1: Government initiative generation renewable energy.

Resources	Potential	Stakeholders
Solar	Enormous	Public and private sector
Wind	Resource mapping required	Public Sector and Public e Private Partnership (PPP)
Hydro	5 MW limited potential in mini or micro hydro power plant. Estimated hydro power potential is about 500 MW	Large Public sector investment
Domestic biogas system	8.6 Million Cubic Meter (MCT)	Public and private
Rice husk based biomass gasification power plant	Potential generation of 300 MW where 2 kg of husk/kWh is required	Private sector
Cattle waste based biogas power plants	Potential generation of 350 MW where 0.752 m^3 of husk/kWh is required	Private sector

Research and development (R& D) in renewable energy technologies

Current activities in research and development of renewable energy technologies are (RETS) in Bangladesh has failed to reach the final state. However both public and private organizations are working to promote proper distribution. List of organizations are under this task.. To map these stakeholders, the following points need to be considered. Mapping stakeholders R & D is an important issue, which has not been taken care of. This can be done by analyzing the ability of the study to make money and the interest of stakeholders, R & D, depending on the capacity of research, human resources, effective, generating revenue and attention to this matter. Stakeholders should be given consideration. One important factor in mapping 'Morph' isomorphism means that the relationship between the components of a complete map taking this other system components into account R & D stakeholders should be brought under a common policy. So that they can be easily handled less bureaucracy with stakeholders, public and private stakeholders -private stakeholders; Technical University is also involved in research and development to come up with the right solution for renewable energy projects are different. With all these problems, also need to consider the following factors in mapping**.**

- Availability of adequate data in handling renewable energy projects.
- Inter/Intra relationship among the R&D stakeholders.

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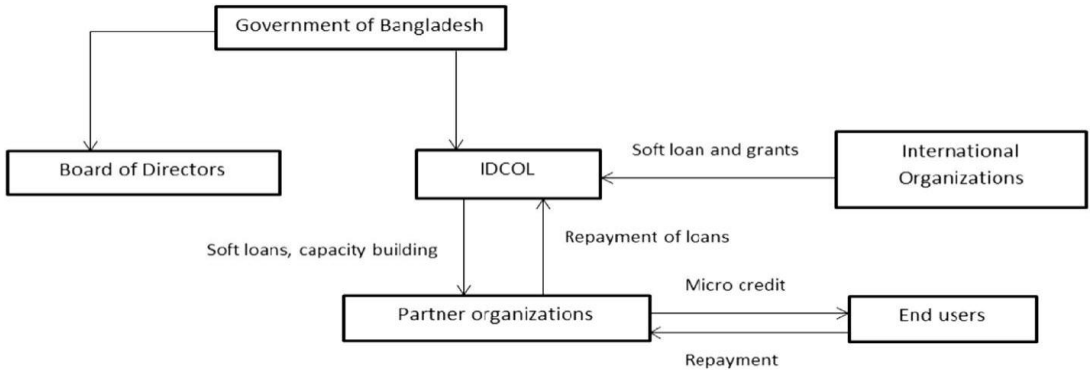
- Implementing the Regulatory Policies.

- Employing the eligible third parties/consultants in R&D projects.
- A separate body under GOB to distribute R&D funds.
- R&D funds should be given for a certain time based on stakeholders' performance, interest and resource

Fig. 6. Implementation approach of the IDCOL program.



Environmental Impact and Sustainability

Widely used is the cause of unsustainable fossil fuels. Coal that affect the environment, the importance of the past applications of electrical and other industries, and development DE CO2 emissions from fossil fuels such as greenhouse gases resulting from thermal power plants. Excessive use of 70 percent of greenhouse gas emissions are resulting from the use of fossil fuels in transportation, such as transport for fossil fuel power plants. The Government of Bangladesh has learned to form a number of coal power plants are used to offset the current energy crisis. This case, the density of population in this country, can cause serious damage to the environment. As reported recently, he has since increased to 60% of world coal consumption from 2010 to 2011, has brought a sea of Bangladesh crop damage is the cause of concern for the environment. High conservation Bangladesh, such as sea level rise and climate change caused by greenhouse gases Perry is a danger zone may occur. However, Bangladesh continues to be one of the countries that are responsible for low emissions. However, I would affect 22,000 square meters easy to 170,000 people into the phenomenon of global warming and of the southern lands. In addition, the generation of greenhouse gas emissions that are harmful will affect biodiversity in agriculture and forestry. Major components live in another world, the sun, as can respond to the situation, wind power, renewable energy such as biomass. CATA-strophic this as a catalyst to meet the electricity needs of peruses, the effects of environmental damage is reduced. As predicted by the researchers involved in Bangladesh, because most of the population live in rural areas, in the best possible hidden for biomass renewable energy, allowing the use of large renewable energy. I have hidden sex. In addition, it is possible to help reduce the possibility of greenhouse gas emissions. Solar Home System (SHS), which can be a substitute for diesel fuel, are also popular. Kerosene fuel is also extensive plains urban and rural areas are currently being used in the field of the overall

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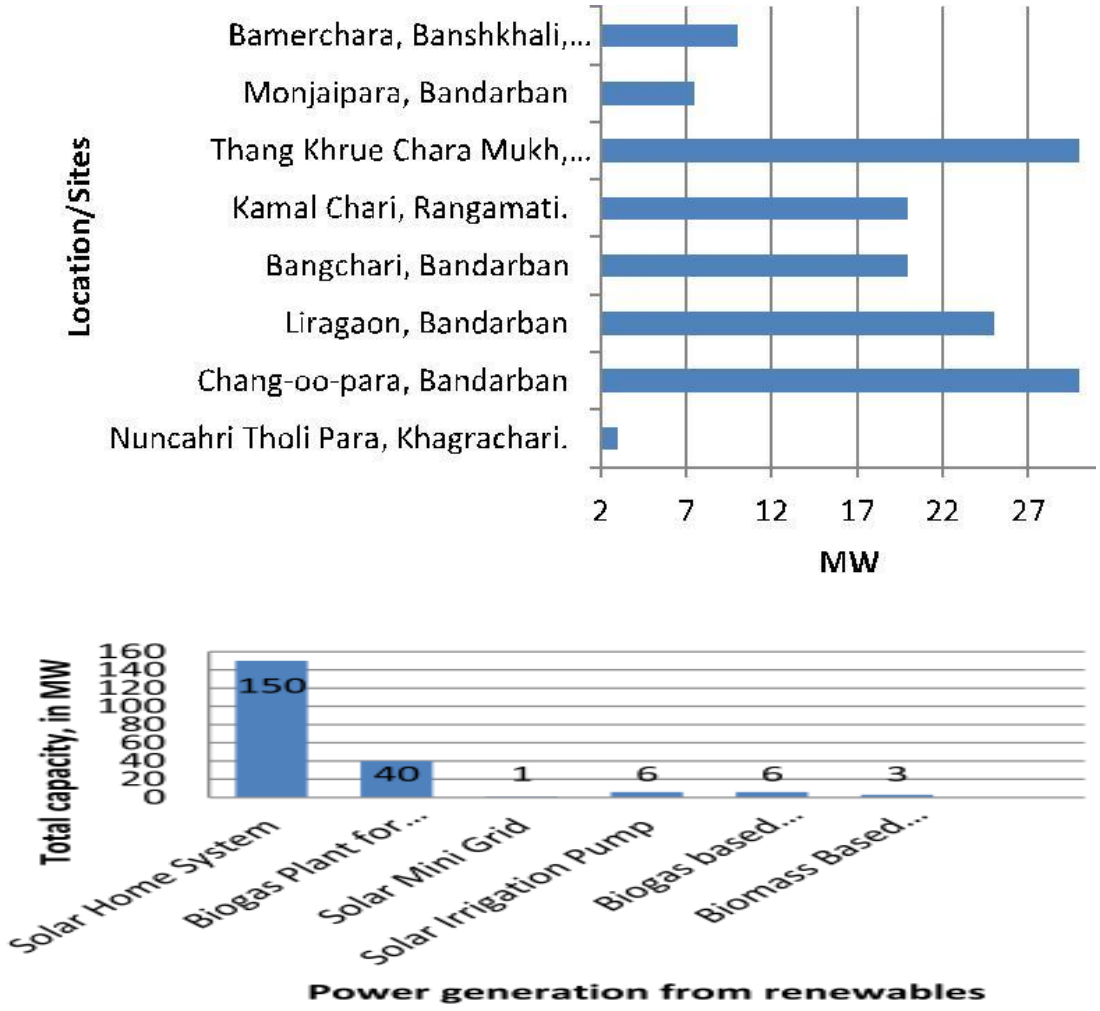
participation of renewable energy, which can lead to exclusion from the use of sustainable energy. In the near future, in addition to their participation ensure a pollution-free environment.

Fig. 7. Power generation capacity in Bangladesh through public private partnership.



CONCLUSION

Energy demand will continue to increase exponentially. Conventional fossil fuel pressure is always building clearly. Fuel prices have continued to rise assented, depleted their reserves. Therefore, this source cannot completely replace it in the near future. However, it looks to be the most sustainable research and exploit in the future of renewable energy station. Some countries have been using the window of opportunity. Technology, Joan was that to get subsidies for this sector is likely to buy, seek regulatory mechanisms motivation behind this appears to be friendly investments. Subsidies, public-private R & D, you can be successful renewable energy projects. Powered is government-funded with renewable energy research. Through subsidies and government-funded research, it is possible to come up with new solutions to solve the energy crisis Bangladesh. Now it's time to invest a lot in the field of renewable energy through the transfer of funds to import refined products from abroad. In

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addition, it is time to identify the use of renewable energy resources available in a number of positions and the best. In 2012, power, Energy and Mineral Resources (MPEMR) stock statistics Department of renewable energy in electricity production is obviously quite encouraging 0.3-0.5 percent, increase. Governments, NGOs and the general public participation, is at least in the short term, and put together to be able to stimulate significant growth in the field. This requires significant R & D detailed planning and overall management of effective and RETS.

REFERENCES

"Global status report", REN21. Renewable Energy Policy Network for the 21st Century; 2012 [Online]. Available at: http://www.map.ren21.net/GSR/ GSR2012.pdf.

Ahiduzzaman M, Islam AKM. Greenhouse gas emission and renewable energy sources for sustainable development in Bangladesh. Renew Sustain Energy Rev 2011;15(9):4659e66.

Alam MS, Kabir E, Rahman MM, Chowdhury MAK. Power sector reform in Bangladesh: electricity distribution system. Energy 2004;29(11):1773e83.

Annual Report, Dhaka Power Distribution Company Limited; 2011 [Online]. Available at: http://202.79.18.61/dpdc/reports/annualreport/ar2011.pdf [accessed 21.03.14].

Annual Report, Rural Electrification Board. Government of Bangladesh; 2009 [Online]. Available at: http://www.reb.gov.bd/documents/annualreport/2008-2009.pdf [accessed 21.03.14].

Awan AB, Khan ZA. Recent progress in renewable energyeRemedy of energy crisis in Pakistan. Renew Sustain Energy Rev 2014;33:236e53.

Bangladesh Economic Review. Ministry of Finance, Government of Bangladesh; 2011 [Online]. Available at: http://www.mof.gov.bd/en/budget/ 12_13/ber/en/chapter-10_en.pdf.

Biswas WK, Bryce P, Diesendorf M. Model for empowering rural poor through renewable energy technologies in Bangladesh. Environ Sci Pol 2001;4(6): 333e44.

BP statistical review of world energy. British Petroleum; 2011 [Online].Available at: http://www.bp.com/assets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/statistical_review_of_world_energy_full_report_2011.pdf.

Bruntland G. Our common future: the world commission on environment anddevelopment. Oxford: Oxford University Press; 1987.

Cato MS, Arthur L, Keenoy T, Smith R. Entrepreneurial energy: associative entrepreneurship in the renewable energy sector in Wales. Int J Entrep Behav Res 2008;14(5):313e29.

Everett R, Boyle G, Peake S, Ramage J. Energy systems and sustainability:power for a sustainable future. Oxford Univerity Press; 2012.

Generation Plan. Ministry of Power, Energy and Mineral Resources. Govern-ment of Bangladesh; 2011 [Online]. Available at: http://www.powerdivision. gov.bd/user/brec/41/58 [accessed 31.03.14].

Hammons TJ, Boyer JC, Conners SR, Davies M, Ellis M, Fraser M, et al.Renewable energy alternatives for developped countries. Energy Convers IEEETrans 2000;15(4):481 e93.

Hossain AK, Badr O. Prospects of renewable energy utilisation for electricity generation in Bangladesh. Renew Sustain Energy Rev 2007;11(8):1617e49.

Islam A, Chan E-S, Taufiq-Yap YH, Mondal MAH, Moniruzzaman M, Mridha M. Energy

ISSN 2055-6578(Print), ISSN 2055-6586(online)

security in Bangladesh perspectivedan assessment and implication. Renew Sustain Energy Rev 2014;32:154e71.
Islam AKM, Islam M, Rahman T. Effective renewable energy activities in Bangladesh. Renew Energy 2006;31(5):677e88.
Kabir M. Energy sector of Bangladesh an overview. Bangladesh Institute of International and Strategic Studies; 2011 [Online]. Available at: http://www. biiss.org/seminar2011/papers/energy_mahfuz.pdf [accessed 23.03.14].
Key World Energy Statistics. International Energy Agency; 2012 [Online].Available at: https://www.iea.org/publications/freepublications/publication/kwes.pdf [accessed 21.03.14].
Khan MSH. Status of coal mine workers in Bangladesh: descent work chal-lenges in Barapukuriah; 2011.
Kumar A, Kumar K, Kaushik N, Sharma S, Mishra S. Renewable energy in India:current status and future potentials. Renew Sustain Energy Rev 2010;14(8):2434e42.
Mahmood A, Javaid N, Zafar A, Ali Riaz R, Ahmed S, Razzaq S. Pakistan's overall energy potential assessment, comparison of LNG, TAPI and IPI gas projects. Renew Sustain Energy Rev 2014;31:182e93.
Martinot E, Chaurey A, Lew D, Moreira JR, Wamukonya N. Renewable energy markets in developing countries*. Ann Rev Energy Environ 2002;27(1):309e48.
Ministry of Finance, Government of Bangladesh [Online]. Available: http:// mof.gov.bd/en/budget/11_12/power/power_energy_en.pdf. [accessed 26.03.14].
Ministry of Finance, Government of Bangladesh. [Online]. Available at:: http:// mof.gov.bd/en/budget/12_13/ber/en/chapter-10_en.pdf.
Ministry of Power, Energy and Mineral Resources, System Loss. [Online]. Available at:: http://www.powerdivision.gov.bd/user/brec/47/87.
Parajuli R, Østergaard PA, Dalgaard T, Pokharel GR. Energy consumption projection of Nepal: an econometric approach. Renew Energy 2014;63: 432e44.
Power Division. System loss. Ministry of Power, Energy and Mineral Re-sources. Government of Bangladesh; 2012 [Online]. Available at: http://www. powerdivision.gov.bd/user/brec/47/87 [accessed 21.03.14].
Power Sector Update. Bangladesh Power Development Board. Government of Bangladesh; 2011 [Online]. Available at: http://www.powerdivision.gov.bd/ user/brec/85/85 [accessed: 21-Mar-2014].
Renewable Energy Policy. Power Division, Ministry of Power, Energy and Mineral Resources. Goverment of Bangladesh: Dhaka; 2008 [Online]. Avail-able at: http://www.powerdivision.gov.bd/pdf/REP_English.pdf [accessed 21.03.14].
Samrina N. Energy security for Bangladesh: prospects and strategic implica-tions of natural gas; 2004.
Sreenivas A. India's energy policy future: here be dragons. Futures 2013;56: 53e61.
Surendra KC, Khanal SK, Shrestha P, Lamsal B. Current status of renewable energy in Nepal: opportunities and challenges. Renew Sustain Energy Rev 2011;15(8):4107e17.
The World Bank. [Online]. Available at:: http://data.worldbank.org/country/ Bangladesh. [accessed 22.03.14].
The World Factbook, CIA; 2012 [Online]. Available at: https://www.cia.gov/ library/publications/the-world-factbook/geos/bg.html [accessed 21.03.14].
Vision and Mission. Bangladesh Power Development Board. Government of Bangladesh; 2012 [Online]. Available at: http://www.bpdb.gov.bd/bpdb/ index.php?option¼com_content&view¼article&id¼3&Itemid¼84 [accessed 21.03.14].

ISSN 2055-6578(Print), ISSN 2055-6586(online)

West Zone Power Distribution Company Ltd; 2012 [Online]. Available at: http://www.wzpdcl.org.bd/ [accessed 21.03.14].
World Energy outlook, In-depth study on energy efficiency. InternationalEnergy Agency; 2012 [Online]. Available at: http://www.iea.org/media/workshops/2012/energyefficiencyfinance/1aBirol.pdf [accessed 21.03.14].
World Energy Outlook: presentation to the press. International Energy Agency; 2012 [Online]. Available at: http://www.worldenergyoutlook.org/media/weowebsite/2012/PresentationtoPress.pdf [accessed 21.03.14].

ISSN 2055-6578(Print), ISSN 2055-6586(online)