Forum: Economic and Social Council

Issue: Exploring sustainable forms of energy to ensure energy security in LEDC's

Student officer: Jahan Tekwani

Position: Deputy Chair

Introduction

As energy becomes increasingly significant in the modern world, it becomes an increasing problem for less economically developed countries (LEDC's). Energy now being something which the world cannot run without, the difference in development and growth between LEDC's and MEDC's is becoming more prominent by the day. As of 2023, the least growing countries in terms of annual GDP growth rate are Afghanistan (-20.1%), Libya (-12.1%), Argentina (-4.9%), Burkina Faso (-4.1%), and Lesotho (-4.01), out of which more than half are classified as a LEDC's by the United .

The causes of the following can be pinpointed at multiple reasons which could be the roots of the situations in several . These challenges include the economic instability, which is one of the biggest reasons for this issue of energy instability, natural events, and the inability to efficiently use resources. These challenges are mainly observed in such as; Chad, Rwanda, Sierra Leone, Mali, Guinea, and many other countries to list. The importance of being able to secure energy in these countries is crucial, especially in the modern world with rapidly growing economies and , all powered by energy.

Exploring sustainable options to be able to create energy is the best possible solution in a situation as the one given. After several issues which do not allow LEDC's to utilize their coal reserves or available resources, finding a long term and effective option is necessary for these .

Without doubt, the United have considered and classified this as an issue to be resolved in the coming years. However, it is imperative that the necessary action is decided and acted upon by the UN, as well as member states and ECOSOC, to be able to solve the growing issue of energy insecurity throughout LEDC's without any delay.

Definition of Key Terms

Energy

The ability to do work or produce power, often in the form of electricity or fuel, is essential for various activities and processes.

GDP (Gross Domestic Product)

The total value of all goods and services produced within a country's borders in a specific time period, typically a year. It is used to measure the economic performance of a nation.

Energy insecurity

The lack of reliable and affordable access to energy sources, which can lead to difficulties in meeting basic energy needs for individuals and communities.

Economic instability

A situation where an economy experiences frequent and unpredictable fluctuations in economic indicators such as inflation, unemployment, and economic growth, leading to uncertainty and risk.

LEDC's (Less Economically Developed Countries)

They are countries that have lower levels of income, industrialization, and human development.

MEDC's (More Economically Developed Countries)

They are countries that have high levels of income, industrialization, and human development.

Skilled Labor

Workers who possess specialized knowledge, training, or expertise in a particular field or industry, often requiring education and experience beyond basic qualifications.

Carbon emissions

The release of carbon dioxide (CO2) and other greenhouse gasses into the atmosphere, primarily from human activities such as burning fossil fuels, which contribute to global warming and climate change.

Unemployment

The state of being without a job and actively seeking work, indicating a lack of income-earning opportunities for individuals. Unemployment rates are measured for the working age population only.

Labor force

The total number of people who are either employed or actively seeking employment in a particular country or region.

IMF (International Monetary Fund)

An international organization that provides financial assistance, policy advice, and technical assistance to member countries facing economic challenges or crises.

IEA (International Energy Agency)

An international organization that promotes energy security, economic growth, and environmental sustainability by providing energy-related data, analysis, and policy advice to its member countries.

UNEP (United Environmental Program)

It is a United agency that works to address environmental issues, promote sustainable development, and protect the natural world through various programs and initiatives.

Key Issues

Economic instability

One of the largest reasons for the lack of energy in LEDC's: economic instability. With almost all LEDC's close to or at the top of the list of economies with the worst GDP's, economic instability is the main root of energy insecurity. This situation in these restricts the nation from being able to afford energy for itself. With nearly 2 billion people without access to electricity and fuels like oil and gas and in demand, less economically developed countries are forced to use biomass as a source of energy. However, this is not a solution to be foreseen in the future. Biomass is around 10%-15% less effective than fossil fuels. Not only this, but it increases carbon emissions, as well as is a key factor in deforestation, which would work against fulfilling the UNEP (United Environmental Program) goals.

There is a direct relation between the economic stability and energy usage of . As energy usage of a nation decreases, the economic growth and overall stability decreases, and as the economic stability decreases it causes lower energy production. This is the cycle, which is occurring in the LEDC's, which is why efficient and large scale energy production is not possible for these countries, and therefore they are not able to grow either.

Costs and time of implementing solutions

The initial costs for implementing modern systems of energy production throughout an entire nation is massive. The cost of energy production as of 2022 is $0.081/kWh, which is a 2% increase from 2021, which was $0.079/kWh. With weaker economies, these steadily rising costs are too high to start large scale production of energy.

To match the demand for energy, it would take LEDC's several years, even decades. Not to mention, demand for energy will keep rising as other advance and as there are more systems which energy is needed for. Realistically, LEDC's will not be able to match energy demands without external support or massive growth in their economies.

Inability to efficiently recruit and use labor

It is well known that the employment rates in LEDC's countries are a lot lower than other . With Africa having unemployment rates of 9% and Asia with about 5% compared to the average of 3%, labor forces are compromised. Labor forces are responsible for extracting sources of energy such as coal, gas, oil etc., and running the factories which produce this energy. With high unemployment rates, this becomes difficult to do.

Currently, a major part of the labor force in LEDC's are not skilled. This is because of the lack in education in these countries. This reduces the efficiency of the labor force massively, especially when unskilled labor rates are this high.

Not only this, but it is expected for unemployment rates to skyrocket in the next few years. As countries get richer, they are able to develop their educational systems, and students are able to access schooling longer. In Africa and Asia, many youths, especially ones who are classified as lower class or poverty class, drop out of school at an early age

to work. This means if they are able to go to school longer and complete their education, the unemployment rates would increase even further. However, this would mean skilled labor would increase significantly.

Low initiatives to develop new systems

A significant part of energy production is based on new and developing systems. Although a major part of energy is used to run the country by providing electricity, it is also used to power and develop new technological and physical systems, such as infrastructure.

In LEDC's, the economic situations are poor. This means that these are not able to start or run the development of these new systems, meaning that energy does not need to be produced. Not only this, but the initiatives to improve infrastructure, roads, and technology in general are quite low, which produces the same outcome: low energy production. More initiatives in investing in these innovative systems will increase competitiveness in generating more ideas and systems and would increase energy production massively.

Restrictions on non-renewable sources and difficulties in transitioning to renewable sources

It is required by African to leave 26%, 34%, and 90% of gas, oil, and coal reserves untouched respectively as soon as possible. Being tough as it is to produce energy, this will make it nearly impossible for African , which account for 70.2% of LEDC's to produce sufficient energy for their .

LEDC's are not big on energy production. Although they have a lot of natural resources, restrictions on the most reliable form of energy; coal, gas and oil will not allow them to grow greatly in this aspect. This means they will be forced into vertical energy

transition. This is when need to quickly increase their energy production and output it into infrastructure, roads, making workable energy regulations in the market etc. This is extremely difficult for to do at the same time. MEDC's do not undergo this process because of previously existing structures in their economy and nation. This makes it very challenging to switch to renewable energy sources, when these LEDC's were not able to use their existing resources.

Choosing a reliable energy source based on conditions of the nation

All forty-seven of the which are recognized LEDC's are based in the continents of Africa and Asia. Both these continents, especially Africa are known for their extreme weather conditions, including droughts, earthquakes, heat waves, and other natural events, which most definitely has an effect on energy production.

Solar power generation is a prominent example. Africa and most of Asia benefits from abundant sunlight, making it a prime location for solar power generation. However, the intensity and duration of sunlight vary across different regions and seasons. Weather conditions such as cloud cover, dust storms, and rainfall can significantly affect the efficiency of solar panels. For instance, rainy seasons can reduce solar power output, while dust storms can require frequent cleaning of solar panels to maintain optimal performance.

Hydropower is another prospect of energy in many African and Asian countries. The availability of water for hydropower generation depends on rainfall and river flow patterns. Irregular rainfall or droughts can lead to reduced water levels in reservoirs and rivers, causing disruptions in energy production. Managing water resources effectively is extremely important in such cases.

The wind energy sector is growing in these continents too, with wind patterns varying significantly with seasonal and weather changes. Understanding wind patterns

and predicting them accurately is crucial for efficient use of the wind turbines. Sudden or extreme wind speeds during storms can also impact the stability and safety of wind farms.

Furthermore, particularly high temperatures can affect the efficiency of energy production and transmission equipment. Power plants may experience reduced efficiency during heatwaves, leading to lower energy output. Additionally, high temperatures can strain electrical grids and increase the risk of equipment failures.

Severe weather events such as hurricanes, cyclones, and floods are common in LEDC's areas and can cause extensive damage to energy infrastructure. These events can disrupt energy production, damage power lines, and disrupt the distribution of electricity. Adequate preparation and disaster recovery plans are essential to mitigate the impact of such events on energy production.

Weather conditions also influence the need for energy storage solutions. Inconsistent energy generation from renewable sources due to weather fluctuations necessitates the development of robust energy storage systems to balance supply and demand. Energy storage can help ensure a reliable and continuous power supply even during adverse weather conditions.

The chosen source of energy not only has to be something that is able to overcome the weather and conditions of these but also needs to match financial abilities. For example, solar power is the most expensive source of energy, therefore it may not be an option for some of these . The chosen source has to be overall cost-effective, as well as a sustainable source in the long-term which is suitable to these .

Time period expectations

While facing all these challenges, less economically developed will be expected to perform this transition to renewable sources and building the structure of their nation all in an extremely small period of time. To be on level terms with other , LEDC's will have to increase their annual production by 350%. China and India have vowed to switch completely to renewable sources by 2070 and 2080 respectively, but doing this in even a remotely close time will be a strenuous effort for LEDC's .

Major Parties Involved

UNDP (United Development Programme)

UNDP is the United agency responsible for promoting sustainable human development and reducing poverty worldwide. It works in various countries to support initiatives that improve living standards, provide access to basic services, and empower people to lead fulfilling lives.

IAEA (International Atomic Energy Agency)

The IAEA is an international organization that promotes the peaceful use of nuclear energy while preventing the spread of nuclear weapons and nuclear materials for military purposes. It helps countries safely use nuclear technology for energy, healthcare, and other applications, while ensuring compliance with international safeguards.

UNEP (United Environment Programme)

UNEP is a United agency focused on addressing global environmental issues and promoting sustainable environmental practices. Its mission is to provide leadership and coordination for environmental activities, foster international cooperation, and assist countries in implementing environmentally sound policies and practices.

World Bank and International Monetary Fund (IMF)

These institutions offer financial support and technical expertise for energy infrastructure projects in LEDC's. These projects will help increase energy production and initiatives for new projects in LEDC's .

International Energy Agency (IEA)

While traditionally focused on developed countries, the IEA has been increasingly engaging with emerging economies to promote energy security and sustainability. They provide analysis and data to , and pertinent solutions and plans to be implemented, which is of great help to LEDC's .

Environmental and Energy NGOs

Organizations like Greenpeace, World Wildlife Fund (WWF), and others work to promote sustainable and clean energy practices in LEDC's. These funds are open for all or can be nation specific. Funds and do allow funds for LEDC's to be able to produce enough energy for homes as well as transition to sustainable sources of energy.

China

China is one of the major countries involved in making the transition to sustainable energy. Already having started this transition, they vow to completely switch to sustainable energy by 2070.

India

Being one of the major countries in the transition to sustainable energy and also being close to China in the switch to sustainable energy sources, they plan to do this by 2080, 10 years after China.

Timeline

Date	Event	Outcome
1970-1980	Initial awareness	There was growing awareness in first scientifically advanced such as the USA about the environmental issues we would face, and later in other countries such as LEDC's .
1992	UN Framework Convention was established.	This set the stage for international cooperation between to work towards a sustainable future. The UNFCCC has made enormous progress in over 30 years since being formed.
2010	The sustainable development goals (SDG's) were formed	These were formed to help LEDC's become more sustainable. Several such as the USA, UK, Germany, Japan, China etc. along with UN initiatives such as the UNDP, UNEP and non-government organizations such as Oxfam, Greenpeace stepped up to fund and help these LEDC's with the SDG's.
2015	The Paris Agreement	The Paris agreement was focused on emphasizing the need for global efforts to limit global temperature rise. LEDC's commit to enhancing their adaptive capacity and promoting

		sustainable development. It has shown tremendous results in the last 9 years towards turning sustainable.
2017	Technological advancements	These allowed for to afford and develop sustainable forms of energy at a much lower price than earlier, which is great news for LEDC's, whose economies are less stable and who have lower purchasing powers.
2021	LEDC's make commitments and policies to make their nations more sustainable. They also collaborate with each other to aid each other in being able to achieve these goals.	These initiatives have helped LEDC's to be able to somewhat shift towards renewable sources of energy, however the results need to be a lot larger in the coming years.

Previous Attempts to Solve the Issue

Investing in renewable sources of energy and diversifying in different sources

Since restrictions are placed on the percentage of non-renewable sources which can be used, LEDC's have to move towards sustainable energy, and fast. A lot of LEDC's have started to invest in these sources. These sources include wind turbines, especially in rural areas with not many other options. Hydropower is widely used because of the great access and availability of these resources to most of the less developed countries. Biomass energy has been used by burning of wood. There are many other sources LEDC's have explores, such as waste-to-energy, geothermal energy, etc.

International partnerships and aid

LEDC's are accepting help externally too. This includes NGO's (non-government organizations), donor agencies, other , international bodies such as the United , and any ideas for projects to produce energy cost-effectively. This is important because by themselves, LEDC's will be unable to produce energy at sufficient rates, and external assistance is crucial. Examples of organizations are the IMF fund and Global Environment Fund for LEDC's.

Investments in infrastructure

Investing in infrastructures has been an effective way to increase energy production. Major parts of building and developing infrastructure are influenced by energy. The problem in the past is lack of initiatives to build this infrastructure. However, investing in it will automatically increase energy production significantly, which is what many LEDC's have started doing. An example of this is India, who started massive investments of their economy into infrastructure, which has transformed them from a LEDC's to now being considered an MEDC.

Preparing for disasters

LEDC's energy stores and reserves are commonly disrupted, destroyed, or affected by natural disasters such as hurricanes, earthquakes, droughts, etc. because of the weather conditions of South Asia and Africa, where most LEDC's are located. Preplanning solutions to preventing this is crucial because it will increase energy production rates and efficiency by a major number.

Possible solutions

Solar energy as a source of energy

Solar energy is one of the most upcoming energies all around the world. Although it is expensive to install, it is one of the most efficient and reliable sources of energy. It is

sustainable, as well as reliable, especially in regions such as Africa and Asia because of the climate. These continents are also the homes for LEDC's, so it would be ideal to use.

Solar power is powered by on-grid supply in more developed countries, and the demand for it is run by middle-class income groups, however in African countries, where most LEDC's lie, it is off-grid supply and is run by lower income groups. Therefore, demand is too little to go forward with this plan. To go forward with solar energy, these will have to increase demand twenty-fold. This is only attainable if they switch to on-grid supply, as it is more reliable and direct.

Lastly, for this solution to work, LEDC's will need the massive funds required to go ahead with installing solar grids. This can be attained using external aid, which many LEDC's countries are already doing.

Removing restrictions on non-renewable energy in the short term

Vertical transitions are incredibly difficult to pull off, especially for low-income countries. If LEDC's countries are to implement new sustainable systems into their , they would need to vertically transition. However, this can be avoided if these were able to develop their energy production in the non-renewable sector, and then move towards renewable sources. Although this would take more time, it is easier for countries to do.

This can be done by easing or removing restrictions for the reserves which can be used in LEDC's which have barely used up their reserves of oil, coal, and gas. Doing so will allow to massively increase energy production as these sources are cheaper and easier to extract and use. After this is achieved, can start transitioning to sustainable sources as basic systems such as infrastructure, roads, power to houses etc. would have already been developed, reducing a massive load.

Actions to improve the economies of LEDC's

Improving the economies of LEDC's is crucial if they wish to utilize renewable energy sources to the maximum. Although most of these are gifted with abundant supply of resources, without the economy supporting the nation, it is not possible to effectively switch to or utilize these energy sources. There are a few causes to the weak economies, which if action is taken to improve, the economy can be greatly developed.

One of the best ways to do this is to increase wages of employees. Currently, wages are too low and citizens are forced into consuming less goods and services, as well as living a poor lifestyle. If wages are increased, consumers purchasing power will increase, and they would be able to purchase and consume more goods, improving the economy greatly.

LEDC's are also greatly reliant on primary sectors, such as the agricultural, mining and fishing industries. Encouraging increases in firms throughout different sectors would trigger competition and better quality goods, more supply, and more intent to produce and consume more goods.

There are many policies and methods which can be implemented in LEDC's to improve their economies. Doing this would increase demand for energy production as well as enable to be able to afford and start-up new renewable energy sources throughout the country.

Bibliography

"GDP Annual Growth Rate - Countries - List | World." *Tradingeconomics.com*, tradingeconomics.com/country-list/gdp-annual-growth-rate?continent=world.

UNCTAD. "UN List of Least Developed Countries." *Unctad.org*, 2022, unctad.org/topic/least-developed-countries/list.

DeSilver, Drew. "The Most – and Least – Energy-Intensive ." *Pew Research Center*, www.pewresearch.org/short-reads/2015/10/29/the-most-and-least-energy-intensive- /.

Akiwumi, Paul. "Least Developed Countries Cannot Afford to Strand Their Assets, given Their Development Challenges." *UNCTAD*, 26 Nov. 2021, unctad.org/news/least-developed-countries-cannot-afford-strand-their-assets-given-their-development-challenges.

"Energy-Poor Countries Face a Special Challenge: Vertical Energy Transitions." *Energy for Growth Hub*, energyforgrowth.org/article/energy-poor-countries-face-a-special-challenge-vertical-energy-transitions/.

Tongia, Rahul. "It Is Unfair to Push Poor Countries to Reach Zero Carbon Emissions Too Early." *Brookings*, 26 Oct. 2022, www.brookings.edu/articles/it-is-unfair-to-push-poor-countries-to-reach-zero-carbon-emissions-too-early/.

"Renewable Power Generation Costs in 2022." *Www.irena.org*, 29 Aug. 2023, www.irena.org/Publications/2023/Aug/Renewable-Power-Generation-Costs-in-2022.

"It's Easy to Exaggerate the Scope of the Jobs Problem in Africa. The Real Story Is Nuanced." *Brookings*, www.brookings.edu/articles/its-easy-to-exaggerate-the-scope-of-the-jobs-problem-in-africa-the-real-story-is-nuanced/#:~:text=In%20sum%2C%20the%20African%20region. Accessed 11 Oct. 2023.

World Bank. "Youth Unemployment Rate for Least Developed Countries." *FRED, Federal Reserve Bank of St. Louis*, 1 Jan. 1991, fred.stlouisfed.org/series/SLUEM1524ZSLDC. Accessed 11 Oct. 2023.

"LDC - Progress in Least Developed Countries Hinges on Access to Modern Energy, New United Report Says | UNCTAD." *Unctad.org*, unctad.org/press-material/ldc-progress-least-developed-countries-hinges-access-modern-energy-new-united.

Pathways to Sustainable Energy Accelerating Energy Transition in the UNECE Region.

"How South Africa Can Overcome Its Energy Shortage | DBSA." *Www.dbsa.org*, www.dbsa.org/article/how-can-south-africa-overcome-its-energy-supply-shortcomings.

Owen-Burge, Charlotte. "Delivering Clean and Affordable Energy to Africa, Faster." *Climate Champions*, 18 May 2022, climatechampions.unfccc.int/delivering-clean-and-affordable-energy-to-africa-faster/.

renewableenergyworldcontentteam. "Why Africa Is Missing the Solar Power Boat." *Renewable Energy World*, 3 Apr. 2013, www.renewableenergyworld.com/solar/why-africa-is-missing-the-solar-electricity-boat/#:~:text=Because%20solar%20in%20developed%20countries. Accessed 11 Oct. 2023.