Review of Planning and Policies of Sustainable Energy Aiming At Environmental Issues, Economic Development and Social Progress: Perspective of Pakistan

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Abstract

In this synopsis, a review has been presented of the essentials of sustainable energy. The review of the planning and policies are developed understanding the impact of the policies on the environmental development of the economy. The economic development factors allow the economy to grow and develop which is aligned with the social progress factors and linked with the perspectives which are adopted in Pakistan (Zafar, Rashid, Khosa, Khalil & Rahid, 2018). The economy of Pakistan is in a developing phase which requires understanding the challenges which are faced by the authorities with implementing the policies and procedures. These practices are essential for the economy and the environment which allows researching remedies for the challenges. Sustainable energy is a solution which needs to be developed in the long run for the growth and development of the economy.

Review of Planning and Policies of Sustainable Energy Aiming At Environmental Issues, Economic Development and Social Progress: Perspective of Pakistan

Introduction of the Study

The core purpose and objective of this study is to understand the changing needs and trends of energy. The use of fossil fuels is reducing with the passage of time based on its cost to the economy and its cost to the environment. The scientists are working continuously for developing alternates which are socially beneficial and reduces the environmental challenges which are hindered by the usage of fossil fuels (Aized, Shahid, Bhatti, Saleem & Anandarajah, 2018). In this study, the planning and policies which are developed at the governmental levels for introducing new forms of energy and replacing the obsolete method have been discussed. The economies such as Pakistan and in a developing phase and have to undergo numerous challenges in implementing the policies and procedures which are critically important for the economy and environment (Komal & Abbas, 2015). Through this research, challenges shall be identified which are faced by the developing countries which shall be supported by research methods suitably accurate and aligned with the core objectives of the research.

Background of the Study

Sustainable Energy is a terminology used for explaining the regular consumption requirement of energy which is facing dangers and challenges of being depleted. These sustainable forms of energy are environmentally friendly and have the potential for being reused again and again with accurate usage of storage methods (Mirjat, Uqaili, Harijan, Valasai, Shaikh & Waris, 2017). Sustainable energy does not harm the environment making it eco-friendly. The most readily available resources of sustainable energy are in

forms such as a solar, wind, geothermal, hydropower etc. which are easily accessible and can be utilized for multiple purposes. The renewable sources of energy are considered as sustainable as they are readily available and accessible. These form of energy is useful as they least damage the environment in comparison to fossil fuels which are limited (Ahmed, Shahbaz, Qasim & Long, 2015). The fossil fuels are a precious commodity which is extracted from land as coal, oil and natural gas. Steps are being taken for developing alternate forms of energy sources which are economical and sustainable for social use within the environment.

The governance bodies of the economies are redefining their planning and policies of sustainable energy. This shows concerns of management towards assessing solutions which remedy the aggravating environmental issues and support social progress from the perspective of Pakistan. The need of developing alternates have been realized for considerably a larger span of time which showed that energy alternates are essential requisites for reversing the damage caused to the planet earth leading to degradation of the environment (Qureshi, Rasli & Zaman, 2016). The excessive emission of Carbon Dioxide and Carbon Monoxide in the environmental challenges the wellbeing of people and is categorized as one of the most significant contributors to global warming. The degradable fuels are reducing which is increasing the cost progressively. This has made the scientists work towards producing an alternate form of fuels which are sustainable and environmentally friendly along with the changing needs and requirements (Valasai, Uqaili, Memon, Samoo, Mirjat & Harijan, 2017). The types of sustainable energy which have been introduced in the society and shall replace the usage of fossil fuels in the future are the following:

- Solar Energy
- Wind Energy
- Geo-Thermal Energy
- Ocean Energy
- Biomass Energy
- Hydroelectric Power

All these forms of energies which have been mentioned above are considered sustainable forms of energy which are regenerated or wasted if not used for benefitting the environment. The governance bodies work consistently for developing the policies through which these alternate sustainable forms of energy can be used and applied for energy generation (Javid & Sharif, 2016). The researchers are of the view that in the upcoming future the only forms of energy which shall be used shall be the sustainable energy methods which are highly cost-effective and environmentally friendly.

The policy makers of energy operating in Pakistan make sure that the present needs regarding the energy consumptions are addressed accurately without compromising the ability of a future generation of the environment to meet the specific needs (Qudrat, 2015). The organizations which are responsible for making the policies and planning to operate in Pakistan are listed following:

- Alternate Energy Development Board (AEDB)
- Planning Commission Pakistan (PC Pakistan)
- International Energy Agency of Pakistan (IEAP)
- Pakistan Institute of Development Economics (PIDE)
- Pakistan Renewable Energy Society (PRES)

- Sustainable Development Policy Institute (SDPI)

Through this research, the sustainable energy policy reforms shall be assessed and addressed. These shall provide details of the policy reforms in Pakistan which allows identifying the constraints being faced within the society for implementation of the changes in energy-related policies (Shakeel, Takala & Shakeel, 2016). The key issues and challenges which are being prevailed in developing economies such as Pakistan shall be identified based on which recommendations by energy experts and influential role of the policy makers shall be evaluated. The assessment of the research enables understanding of the gaps which are supported by scientific findings to the solutions and the problems associated with those solutions (Qazi, Jahanzaib, Ahma & Hussain, 2017). New and existing policies are essential to be evaluated using the descriptive and analytical findings which have been developed in the past for supporting the findings of the topic.

Problem Statement

Through this research, a review shall be presented of the planning and policies which are developed for introducing sustainable energy methods within a developing economy of Pakistan. The purpose of the evaluation is an assessment of environmental issues, economic development and social progress of the economy which is essential for presenting viable solutions for energy (Ahmed, Mahmood, Hasan, Sidhu & Butt, 2016). The proposition of methods of sustainable energy is not accepted in the developing economies as the cost of implementation and stakes of acquiring results are high. This develops problems in the long run because the usage of fossil fuel is exceptionally costly. It uses and application throughout impacts heavily on the cost of production of energy based solutions. The manufacturing costs and household costs which are applied within

the economy also increase due to valuable resources — these impact on the economic cycle and social progress of the economy in the long run (Zameer & Wang, 2018). The other most crucial problem associated with usage of fossil fuel is its damaging impact on the environment. The authorities are required to develop plans and policies so that alternates are developed which shall slowly and gradually lead towards economic development of the society.

The essential aspect which shall be evaluated through this study is an assessment of renewable energy technology and considering that whether its deployment within a developing economy such as that of Pakistan shall be evaluated or not. The current economic circumstances are challenging and hence understanding the growing need for sustainable energy alternates are highly crucial for defining the growth prospect and development within the economy (Lin & Ahmad, 2017). The development of a green economic model requires slow and gradual efforts towards implementing practices which are sustainable — these link with the application of Low Emission Development Strategies which increase efficiency through bio-diversity and eco-system application. Suggesting the application of low carbon emission methods are most essential for making the environment green.

Literature review

The review of planning and policies of sustainable energy which prevail within an economy allows assessing the aims which the governments seek towards accomplishing. The focus of introducing the new forms of energy is acquiring solutions which are cost effective and less damaging to the environment. Over the years several researchers have contributed towards understanding the aims of acquiring economic development and

secure the environment of society. It is a progressive aspect which lifts the social progress (Raza, Akram, Javed, Rafique, Ullah, Ali & Ahmed, 2016). The evaluation is classified from the perspective of Pakistan which signifies that small segments of the society are considered through acquiring a viable and sustainable alternative for the economy as a whole.

Sustainable Energy and Energy Efficiency Methods

The sustainable energy solutions are developed for reducing the damage which is executed on the society. The measures which allow developing sustainable energy solutions are based on assessing the future needs and requirements. The social progress and development are accomplished through using the resources which are available within the society. The use of fossil fuel is highly damaging for the environment (Zaman, Abdullah, Khan, Nasir, Hamzah & Hussain, 2016). The vice versa assessment shows that the environment is rich with energy such as the water, sun and forests. Through adequate planning and development of long-term strategy the governments can accomplish goals of social progress. The social progress is linked with the utilization of environmental assets efficiently which are water, sun and forests. These allow the formation of bio-fuel which allows progressive development of the economy and saves huge costs which are incurred through the use of fossil fuels. The assessment of the climatic environment allows usage of ecosystems which are supported by the greenhouse gasses. The emission of CO2 from the plantations can be used for supporting energy generation which is highly environment-friendly (Akber, Thaheem & Arshad, 2017). All these aspects of biodiversity are highly essential for understanding the aspects of sustainable energy.

The energy efficient methods are developed through the use of Low Emission Development Strategies (LEDS). These methods are supported by the progressive formation of increased efficiency such as using methods of greenhouse gas utilization. The methods reduce the amount of carbon dioxide which is available in the environment so that environmental issues can be rectified. Sustainable energy supply is a crucial factor for the economic growth and development which can impact on any society (Tofigh & Abedian, 2016). The factors which influence Pakistan towards designing alternates of sustainable energy are the severe shortage conditions of energy throughout the country. The political schema of Pakistan has long focused in determining the methods which can redefine the energy policies and fill in the demand for energy shortage throughout the country. Over the years the gap between demand and supply is increasing dramatically which can be linked with factors such as seasonal change and lack of resources (Raza, Shahbaz & Nguyen, 2015). The development processes of renewable energy have been developed with the framing and provisions for supplying affordable, sustainable energy and make it accessible for everyone.

Increasing Resilience

The focus of government of Pakistan has been significantly towards crafting solutions which are highly viable and affordable for the public at large. The shortage of electricity and natural gas has been recognized mostly in the rural areas which are located in farfetched areas. The policy implementation and changes in reforms have been practiced regularly over the years for improving and enhancing the outcomes for the public at large (Raheem, Abbasi, Memon, Samo, Taufiq, Danquah & Harun, 2016). The development of the policy of energy is mainly dominated on the factors of energy

security and self-sufficiency. A balance between these factors leads towards social equity and economic benefits within the society which are highly challenging for the management and governance taking the initiatives.

The renewable energy policies of Pakistan are developed through examining the findings and securing the energy supplies of the region using LEAP. The focus and aim of these policies extend towards increasing the outcomes of business, forming a green Pakistan, optimizing the utilization of nuclear energy and reaping well-being of the people (Alam, Malik, Abdullah, Hassan, Awan, Ali & Naseem, 2015). The validity of these energy plans can only be recognized through deploying technology and embracing the advancements on practices which are being performed in the existing systems. The deployment of these systems is linked with reducing the operations and externality costs which is the most sustainable solution for the entire economy in the long run.

The increasing advancement in technology over the period has introduced new methods and practices which are highly efficient and allow reducing the financial costs. The application of the system of GMM estimation techniques allows assessing the impact of financial development over the factors of economic growth channel. The energy prices and urbanization are the practices of urbanization on energy consumption methods which affect the energy prices in accordance with the factors of energy consumption (Rafique & Rehman, 2017). The researches show that the impact of energy prices overconsumption are negative but significant. The policymakers are responsible for assessing demand, planning and conservation methods related to electricity. These assessments allow understanding and accumulating the increasing demand for energy in Pakistan over the period. The resilience factors are increased with the adoption of methods such as

plantation of trees and sustainable energy methods which are linked and connected with using the resources such as agriculture and water within Pakistan (Sovacool, 2017). The implementation of these methods is done by storing the carbon and development of methods for the process. Application of tools of biodiversity, regulating the water flows and reducing the soil erosions are essential for the increased resilience of the process.

Application of Socially Progressive factors

Socially progressive factors are highly important for the society which includes the application of energy efficient construction in the buildings and deploying the transportation practices which save the energy cost and excessive emission damaging the environment. The economies develop adequate models for this factors which are socially inclusive with low carbon emission and resource efficient practice application (Qureshi, Awan, Arshad, Rasli, Zaman & Khan, 2016). This can only be implemented by developing a specific set of policies, skills knowledge and incentives which can benefit the society at large. Pakistan is facing numerous challenges regarding energy resources and devising the rational energy policies which can be used and implemented across the country. The evaluation of energy resources are abundant throughout the countries, but the resources required for coping with the extraction requirements are also less. The recognized supply gap of energy throughout the country is estimated to be more than 5000 MW (Qudrat, 2017).

The power planning studies since the independence of Pakistan in 1947 in contrast to the policies announced so far show that the dynamics of utilization of resources have shifted. Initially, the water resources were used heavily for the production of energy, but with the passage of time, the reliance on fossil fuels increased dramatically

to cope with the energy deficit factors (Perwez, Sohail, Hassan & Zia, 2015). The solutions which have been adopted are highly costly reducing sustainability of the practices which are being used and practiced in the country. The infrastructure development of Pakistan was stabilized in the year 1994 when the official introduction of power production and reports were presented for benefitting the outcomes suitable for the society at large (Couto & Olden, 2018). The increasing industrialization within the economy is increasing the consumption factors which associate with energy planning and modeling practices applicable in the society. The examples of modeling tools which are used for the assessment of energy factors are MARKAL / TIMES, LEAP, ENPEP BALANCE, MESSAGE and EnergyPLAN (Siddique & Wazir, 2016). These tools are used effectively and efficiently globally which is enabling devising the energy systems and policy formation through which application of sustainable alternates can be applied throughout the economy for eradicating the electricity crises.

Sharing Energy Efficiency Practices

Energy efficiency is the requirement of the modern time which can only be acquired through adequate application of technology. The application of technology allows reducing the burden and allows enhancing the energy infrastructure of the system. The application of energy efficient methods and practices are those which are used for reducing the cost of production and enhance competitiveness within the society (Jewitt & Raman, 2017). A viable energy solution is essential for the economy as it allows enhanced production and utilization based on requirement assessment factors. The sustainable infrastructures dominate the environment heavily which is linked and connected with the factors of energy security. The benefits of an efficient form of energy

are reduced greenhouse emission and air pollution (Huda, Burke, Azam & Naz, 2017). The usage of these methods is also effective as they are uninterrupted which automatically resolves the large-scale industrial problems of the society.

The application of efficient energy practices is recognized mainly as those which involve the application of enhanced energy saving methods. These are using the copper windings and high-efficiency motors in the equipment which are introduced in the society. These allow saving Kilowatts of energy which enhances the efficiency ultimately (Lin & Ahmad, 2016). These factors are also beneficial in reducing the effects of global warming which is a challenge for society. The energy efficiency methods require adequate usage and application of technology in the practices which make the energy factors sustainable and enhance the usage over the period of time. Innovative practices in the commercial technologies benefit the environment and the economy in the long run (Faisal, 2017). The commercial application of technology and innovation require adequate administration which can only be done through crafting sustainable policies and practices. All the aspects of technicalities must be evaluated which can only be reckoned through a sustainable infrastructure.

Energy Entrepreneurship

The economies face several factors within the energy segment which require the application of policies and planning allowing to curtail the shortfalls. The societal barriers and challenges faced for application of modern practices are numerous. These inventions which have been developed over the period of time and formation of public awareness schemes for enhancing the usage of sustainable energy require deploying adequate amount of knowledge and skills which can make this possible (Khan, Zaman &

Zhang, 2016). The technological innovation which is deployed and its synergy with the factors of material, standards and incentives are the challenges which are faced by society with the implementation process. The conversion of methods of energy generation from fossil fuel to sustainable energy methods requires evaluating the factors of electricity supply shortages which cause the forced power outages over the years. The rural population of Pakistan is highly derived from energy and power which results in excessive shortfalls (Anwar, 2016). The energy resources are also depleting due to the financial constraints which have to be faced by the responsible authorities.

The existing situation of the economy is facing numerous energy crisis challenges for meeting the energy demand. The energy security in the context is important as a considerable segment of the impact also arises due to the adverse climatic situations which the country has to face. The geographical location is hence the most critical factor in this understanding. The country requires aggressive initiatives which can be used for safeguarding the energy aspects of Pakistan and proposing methods through policies and planning which can enhance the sustainability of the economy. Public awareness is the most crucial aspect of propositions as it is the public which dominates society and makes the introduced propositions applicable (Shaikh, Ji & Fan, 2016). Affordable electricity generation, transmission and distribution of energy are essential aspects which connect with the sustainable development of energy within the country.

Transition from Fossil to Non-Fossil

The government policies are the factors which dominate the development of energy systems which are better and smarter. The government based subsidies and allocation of consumers of fossil and non-fossil emission practices are essential for

sustainable development solutions. The energy system based propositions are linked based on the growing needs of the 21st century. The fossil fuel development is linked with developing the Sustainable Development Goals which enhance the outcomes and allowing governments in making policies which accumulate in accordance with the financial goals (Rauf, Wang, Yuan & Tan, 2015). The realized gaps in the energy segment are numerous which deprives the rural population of availing its fundamental right of accessing sustainable power solutions. The damage on the society due to weak policies are numerous as they damage the environment and the economy in the long run. The research estimates show that the fossil fuel subsidies lead towards a global decrease in carbon emission factors which benefit the climatic situation of Pakistan and also reduce health care impacts due to the increasing level of pollution (Komal & Abbas, 2015). The aspects of renewable energy and energy efficiency are connected with the estimates of combined fossil agreements which save numerous cost with the use of renewable energy and energy efficiency.

Pakistan is categorized amongst the underdeveloped and populous countries of the world. The source of energy for keeping development on track requires that strong policies are developed and implemented which resource with the development conventions of the region. The domestic energy requirements are impacted based on the aspects of the acute energy crisis (Qureshi, Rasli & Zaman, 2016). These factors impact significantly on production which dampens the economy. The gap which is developed between the demand and supply leads to the blackouts which plunge the economy into darkness. The crisis situations which are developed are not overnight and are results of failing policies and procedures. The pile of issues relating energy crisis are developed

through the root cause of debacle which is attributed to mismanagement, poor planning and negligence (Javid & Sharif, 2016). The assessment of the transition of fossil towards non-fossil is developed as an overview of the situation of the energy sector of Pakistan. The energy policies which have been developed by the government of Pakistan shows lack of focus on energy mix. The focus of the economy is excessively on the usage of fossil fuels which rise the electricity generation cost along with the power generation emission factors.

Objectives

The core focus of this research is towards assessing the energy situation which prevails in Pakistan. Through this research, development shall be done towards understanding the planning and policies of sustainable energy which is developed over the years. The energy situation of the economy must be assessed in the form of a timeline developed throughout the economic era after the independence of Pakistan which was acquired in 1947 (Qudrat, 2015). The environmental issues and economic development of Pakistan are linked with the aspects of social progress and development. All these factors have been assessed from the perspective of Pakistan which shows a direct relation of the development of policies and planning. The reforms which shall have been implemented and which are required to be assessed in this era are discussed through this research.

The aims and objectives which shall be accomplished through this research are the following:

- Identification of policy and planning reforms which are required to be implemented within the economic system of Pakistan.

- Evaluation of the timeline of development within the energy sector along with changing requirements of energy over the period of last 20 years.
- Understanding the key issues and challenges which have been faced in the development of the energy sector of Pakistan over the period of last twenty years.
- Identification of constraints which have been faced with the propositions presented of sustainable energy initiatives in the development of the energy sector of Pakistan.
- Evaluation of the recommendations which have been provided by the energy experts and policymakers involved in proposing the policies and practices of the energy sector of Pakistan over the period of last twenty years.
- Scientific findings and solutions to the problems which have been proposed and are applied globally pertaining to the global energy sector over the period of last twenty years.
- The environmental aspects of the energy policies which are evolving the trends being practiced within the energy sectors of the country.
- The obstructions which are faced by the energy sector due to the economic policies of the country over the period of last twenty years.
- Social benefits and impacts which can possibly be exercised on the economy with the introduction of sustainable energy practices in Pakistan.

All these factors which are introduced shall be focused as essential objectives of the study. Based on these objectives the significance and scope of the study are crafted. It is highly essential that these methods are evaluated against the policy implications which are practiced.

Significance of the Study

The significance of the study is essential to be analyzed as it explains the benefits which can be realized through the research in the future. The energy and power generation systems of Pakistan are facing challenging circumstances which need to be remedied on an immediate basis. This can only be done by introducing the practices which are technologically equipped, innovative and beneficial for the economy in the long run (Shakeel, Takala & Shakeel, 2016). This study aims at evaluating the energy generation system of Pakistan and evaluate the significance of applying sustainable energy methods in society. This allows understanding the aspects of economic development, environmental sustainability and social aspects linked with strong development of policies and planning associated with the economic development of Pakistan (Zameer & Wang, 2018). All these aspects of evaluation make the study highly significant for analysis which can further be linked with the scope of planning future prospects through the application of adequate policies.

Scope of the Study

The scope of this study is highly elaborate as it evaluates the development of the energy sector after the independence of Pakistan which took place in 1947. The changing needs and trends of economic development have redefined the power requirements of the economy. The measures and the policies which have been adopted over the years against sustainable energy methods are discussed in detail with the passage of time (Lin & Ahmad, 2017). These methods are essential for understanding the loopholes of the policies and planning which has increased the usage of fossil fuels. The initiatives which

shall be taken for the transition of enhanced usage of fossil fuel towards sustainable energy alternatives or non-fossil fuels.

Research Questions

The research aims at addressing the loopholes and gaps in the policies and planning which have been left unaddressed with sustainable energy aims and practices. The research question is the following:

- Which policies and planning have been developed over the period of last twenty years in Pakistan for implementation of sustainable energy practices?
- What environmental, economic and social progress benefits can be developed through the application of sustainable energy in Pakistan?

These research question are assessed through the timeline of energy policies and planning developed over the period of last twenty years. The planning and development are associated with suggesting methodology which shall be developed for conducting the study and assessing the essentials of application of energy policies and practices (Akber, Thaheem & Arshad, 2017).

Hypotheses

The hypotheses which are developed for evaluating the topic of this research is the following:

H1: Policies and planning which has been developed by Pakistan's government over the period of last twenty years are adequate to meet the energy needs.

H0: Policies and planning which has been developed by Pakistan's government over the period of last twenty years are not adequate to meet the energy needs.

H2: Environmental, economic and social progress can be attained through the application of sustainable energy in Pakistan.

H0: Environmental, economic and social progress cannot be attained through the application of sustainable energy in Pakistan.

H3: The financial policy of the economy has a significant impact towards application on innovative technological initiatives.

H0: The financial policy of the economy does not have a significant impact towards application on innovative technological initiatives.

All the hypotheses which have been developed and discussed show the essence of logical analysis of the topic. The policy decisions of the government have highly impacted the energy sector of Pakistan. These decisions have weakened the infrastructure of the economy without providing any strong initiatives of sustainable energy alternates for the economy (Tofigh & Abedian, 2016). These practices are essential for the economic development and environmental sustainability of Pakistan. The statistical tests which shall be applied on the hypotheses are regression and correlation techniques.

Limitations

The limitations associated with these studies are that the researchers can find information which is documented against the methods adopted for energy generation. The practices which are assessed for this research are limited towards certain segments of research. The limitations are the following:

- Technical change, inter-factors and inter-fuel substitution shall not be evaluated through this research.

- The aspects of the elasticities of energy sources shall not be covered in this research.
- Factors of economic growth and political turmoil shall not be discussed in this research.
- Low-income households and price factors of energy policies along with subsidies provided by the government shall not be evaluated.
- The technological innovations or advanced development policies shall not be discussed in this research.

All these limitations which have been discussed limit the scope of the study. These factors are assessed based on the understanding that certain barriers and limitation allow the research to be streamlined in accordance with the outcomes which are expected to be extracted from the research.

Methodology

Methodology development is the most critical segment for the research. The methodology connects with the aims and objectives of the research and crafts the outcomes which are essential for the study. The application of methodology shall be done using both the qualitative and quantitative tools of research. The qualitative information is the theoretical information which is extracted for the research based on researches which have been conducted in the past (Raza, Shahbaz & Nguyen, 2015). The qualitative data is mainly aligned with the information used in researches, peer-reviewed article and results which have been acquired by researchers in the past. The application of the quantitative information is based on the numeric findings associated with the topic. The

assessment of researches which have been executed in the past and the quantitative findings extracted from the study compile the quantitative information of the study.

The methodology which is adapted for different researches varies based on the kind of research which is being required to be conducted. The qualitative and quantitative techniques shall be applied through the accumulation of primary and secondary data of research. The analysis allows understanding the fact that applicative usage of the primary and secondary data are both essential for the research. This research shall be developed with the application of both the qualitative and quantitative techniques hence pragmatic philosophy of research shall be most accurate in crafting the outcomes of the research (Rafique & Rehman, 2017). It is an essential understanding that hypotheses which have been developed for the study shall be tested. All these aspects are essential for the research approach which shall be used shall be the deductive approach. The application of both the approaches is essential as the research philosophy which is applied for this research shall be the pragmatic approach which requires the use of both the qualitative and quantitative forms of the study.

Population, Sampling Design, Source of Data and Data Collection

The research design shall be developed using the cross-sectional method of study. This technique is highly cost-effective and allows gathering the data in an uncontrolled environment. The outcomes of the research are highly accurate which allows testing the hypotheses developed for the research (Sovacool, 2017). The data compilation is aligned with the information developed for the study. It is integral for the study that a tool shall be determined for accumulating the data for the research. A structured close-ended questionnaire shall be designed for this study which shall allow accumulating the

responses of the stakeholders of the study. The stakeholders of this study are the Energy Experts, AEDB, REAP, PEC etc. who are responsible for the policy development and planning involved in those practices (Qudrat, 2017). The responses of the questionnaire which shall be designed for this research shall be acquired from the Planning commission of Pakistan, entrepreneurship businesses and professors who can adequately comment on the prevailing situation of energy generation and essential requirement of sustainable energy for the study.

The primary and secondary data shall both the aligned for this research which is an integral component of the study. The respondents who shall be selected for the study shall be one hundred and fifty random individuals who work for the Planning Commission of Pakistan, Entrepreneurship Businesses and Professors teaching at reputed universities and are aware of the energy crisis situation which is prevailing in Pakistan (Perwez, Sohail, Hassan & Zia, 2015). The accumulation of primary data can be easily and accurately done through the usage of a structured close-ended questionnaire. The sampling methods which has been selected for this research is non-probability convenience sampling method which allows accumulation of all the responses which have been generated through the questionnaire (Couto & Olden, 2018). The outliers in the forms of responses shall be discarded based on the data which and quality of responses which are generated through the research.

Tools Used For Data Analysis

The tools which shall be used for the data analysis shall be based on the application done through the generation of results through Statistical Packages for the Social Sciences (SPSS). This software allows consolidating all the data generated through

the questionnaire and accumulating it for deriving results which are accurate and adequate for the study. SPSS is one of the most accurate software developed for evaluating the data and accumulating data based on the test applied (Siddique & Wazir, 2016). All the tests are applied in accordance with the outcome requirements of the study.

Results

The results which are required from this research shall be based on understanding the essentials of proposing the application of sustainable energy methods on the society. The research aims at addressing the time series data of Pakistan for reviewing the policies and planning which has been developed over the period of time. The dependent variable for this study shall be environmental factors such as environmental degradation and increasing energy consumption. This shall be supported by the economic factors which include economic growth and increasing consumption of energy needs of the economy (Jewitt & Raman, 2017). The independent variables of the study shall be policies and planning which have been developed over the years. The connection of the independent and dependent variables is essential for understanding the growing implications of economic, financial policies and adopting sustainable energy methods for the economy.

Through the evaluation of the study, it is clear and evident that tests like the Autoregressive Distributed Lag (ARDL), co-integration, regression and VECM–Granger causality test shall be used for evaluating the time series data acquired for the study. The review of the policies and planning shall be connected with the aspects of environmental factors, economic factors and social aspects of the study which allow understanding the dominating role of governance. Governance is an essential factor for the study which links with the development among the variables as required in the long-run and short-run

of the economy (Huda, Burke, Azam & Naz, 2017). This shall be linked with the primary data accumulated for this research based on a structured close-ended questionnaire and analyzed using the application of statistical methods adequate for aligning the information of research. This shall determine the significance of the application of sustainable energy techniques in the economy.

Discussion

The economic development of Pakistan has faced numerous challenges over the years. The policies and planning techniques have not adequately supported the application of sustainable energy methods in the economy. This is done because of lack of financial support from the government. This research evaluates the challenges which have been faced in the energy sector over the years and proposed methods for resolving the challenges (Lin & Ahmad, 2016). The essentials of sustainable energy are also aligned with the study which allows understanding of the scope of development in Pakistan.

The energy consumption in Pakistan has developed significantly over the years which has mainly been done due to the industrialization process. The growing needs and requirements of sustainable energy have required the government to take initiatives which align with the short-term and long-term policies of the economy. The government has taken initiatives such as setting up the thermal power projects which are expensive and damaging to the environment (Faisal, 2017). The setting up of the hydro-power project is cost effective and less damaging on the environment which allows assessment of the environmental degradation process. The government of Pakistan has taken initiatives such as the utilization of trans-log production functions which employ the non-

energy factors and allow converting those into energy based factors (Khan, Zaman & Zhang, 2016). The process which is required for implementing the process requires research through which elasticity of substitution is acquired.

The government takes measures for policy suggestions using which the economic growth objectives are accomplished. The adequate usage of capital and labor are used as an application tool which increases the focus of technological advancements. The skilled employment generation techniques which are used for conserving energy and reduce the aspects of CO2 emission benefits the sustainability of the environment. The government subsidies and financial limitations for application of new methods and techniques are discouraging factors which result in slow development and application of changing technology within the system (Anwar, 2016). These factors impact significantly on the economic development in the long run which requires the government to take initiatives and develop diversified energy supply mixes supporting the hydro and renewable energy sources other than natural gas.

Conclusion

This research is developed with the core objective of understanding the need for introducing sustainable energy methods in the society. The economic development and environmental factors which impact on the social aspects of the society are evaluated through this study. Developing economies like that of Pakistan face certain restrictions financially and economically due to which the government is forced to adapt with alternates available. These alternates are adopted based on the policies and planning proposed by the authorities (Shaikh, Ji & Fan, 2016). All these aspects are evaluated and discussed in this research. The analysis shall support the hypothesis which has been

developed for the study which identified the challenges involved in the application of practices of sustainable energy generation.

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