Research Proposal (Template)

Turkey Burslari Scholarship

Q1. Working Title (Up to 15 words)(Please write in short and concise terms the title of your work as a thesis or an article title.)

How recycling of municipal solid waste Management affect the energy efficiency and economic growth?

Q2. Analysis of the Problem (at least 75, maximum 300 words)(In this section, briefly describe the topic and your theory (concept map) to be used in the study:

Increase in population of the world lead to more consumption natural resources and increase in the production of waste, and this waste is not only an environmental problem, but also an economic loss.(EEA, 2014). According to (World Bank, 2019) what a waste 2.0, the world generates 2.01 billion tons of municipal solid waste (MSW) that is expected to grow to 3.4 billion tons by 2050.

The unsustainable waste management causing severe hazardous health, environmental effects, and economics loss, which are more, observe in developing countries (Gourve, Parveen, 2017). According to the Pakistani government, 87,000 tonnes of solid waste are generated each week, primarily in larger cities (ITA, 2022).

Several studies shows that MSW recycling is key elements to achieve sustainable development and provides opportunities to decrease oil consumption, carbon emissions and convert large quantities of waste into useful resources and energy that generate economic value, save resources and reduce land filling (Nasrollahietal.2020). In previous study, researchers analyzed different MSWM and draw its link with economic and environmental aspects by utilizing firm, industry, or survey level analysis. There is a dearth of empirical evidence to draw a link between material recycling impact on economic is missing at national level in developing countries (Razaaq, 2021).

Due to these limitations, academicians, policymakers, and government legislature are unable to evaluate the net effect of recycling on overall economic growth. To fulfill the gap, this study intends to estimate the economic and energy efficiency impact of national MSW recycling in the developing countries to achieve sustainable development. This potentially be a pioneering study to guide both academicians and policymakers to draft waste management strategies to attain sustainable development goal.

Research Method (minimum 50 maximum 300 words)"(Give information about the academic research methods you intend to use in this study. For example, in-depth interviews, observations, surveys, experiments, etc.) For example, in-depth interviews, observations, surveys, experiments, etc.)

The main aim of this study is to analyze the effect of MSW recycling on economic growth and energy efficiency in the context of Pakistan. In order to realize these objectives, we follow well-known neoclassical growth model to derive economic growth (Paramati et al., 2017) through MSW recycling and energy efficiency:

- $GDP_t = f(CAP_t, LAB_t, RCY_t, EEF_t)$.

Where GDP, CAP, LAB, RCY, EEF represent economic growth, capital, labor, MSW recycling, and energy efficiency, while t represents time. However, Dietz and Rosa (1994, 1997), which is famously recognized as Stochastic Impacts by Regression on Population, Affluence, and Technology (STIRPAT) model. This study will follows common characteristics of the STIRPAT model to derive an empirical modeling framework as:

$CO_{2t} = f(POP_t, PI_t, RCY_t, EEF_t)$ (3)

The above factors will examines the influence of MSW recycling and energy efficiency by simultaneously considering other important factors in a multidimensional framework.

3.2. Data

This study utilizes quarterly data of Pakistan spans from Q1-2000 to Q4- 2020, which include: Municipal Solid waste in metric tons per capita; MSW recycling (RCY) in tons; energy efficiency (EEF) ; economic growth measured as gross domestic product (GDP); gross fixed capital formation capital, total population (POP), and finally per capita income (PI) is derived through the GDP divided by the mid-year population.

Following prior literature, we will converte all the variables in logarithm, which provides output in the form of elasticities that make the interpretation process easier (Paramati et al., 2017; Shahbaz et al., 2020).

The data for the above variable are available on different online authentic sources, which are freely available:

- Pakistan Environmental agency.
- Data World Bank.org
- Pakistan energy Development Board.
- Pakistan council for renewable energy.
- Pakistan Beurue of statistics..
- International trade organization.

Q4. General Structure of the Study (at least 75, maximum 300 words) Write the main headings of the study.)

- Abstract
- Introduction
- Statement of objective
- Analysis of Literature
- Research Methodology
- Result
- Discussion
- Conclusion
- Recommendation
- References

Academic Contribution of the Study (minimum 75, maximum 300 words) (Explain how this study will contribute to your academic field.)

This study will contribute direct and indirectly to academia, governments, organizations and societies. If the correlation between recycling of Municipal Solid wastes Management are positive with economic growth, which may lead to the following results:

For Academia:

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- In previous literature, the MSWM linked with mostly environmental aspects and there is a gap.).

For Societies:

With the help of this study, I believed that this study would be make contribution to Clean and green mission if governments and regulated body make a policy.

Recycling of MSWM considered the best solutions to manage waste, which save

- Save Resources and energy for coming generations.
- Save energy.
- Supply raw material to industry.
- Creating jobs.
- Develop greener technologies.
- Reducing the need for new landfills and combustors.
  All these factors lead to saving net carbon emissions and generate significant economic value, which improve the overall living standard of economic growth.

For institute/Government:

- It clearly visualizes the positive impact of solid waste management on economic growth, which indicates positive sign of revenue and jobs creation in near future.

- If government implemented this policy to MSWM and recycled, million tons of waste will play their role in economic growth and energy efficiency.

- Proper policy of waste recycling may generate employment opportunities to both skilled and unskilled labor force.

- This study will attract the attention of the government to target recycling policy as a stimulator of economic growth amongst others because it creates the economic value from waste whilst provide employment opportunities to both skilled and unskilled labor force that collect and process waste from communities.