ARYAVART SHODH VIKAS PATRIKA
RNI TITLED NO. UPBIL04292
RNI REG. NO. UPBIL/2014/66218 PP. NO.- 14-17

ISSN NO.-2347-2944 (Print)
e-ISSN NO.-2582-2454 (Online)
Vol.-15, No.- II, Issues-24, YEAR- April-June-2022

Socio-economic And Environmental Impact Of Renewable Energy

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Abstract: Constantly rising energy request joined with progressively restricted regular assets are testing energy providers, either for industry or purchasers force to re evaluate how we produce and use energy. Sustainable power suggests normally recharged, It is energy which comes from inexhaustible regular assets like daylight, wind, downpour, tides, and geothermal intensity. Around 16% of worldwide last energy utilization comes from renewable, with 10% coming from customary biomass, which is chiefly utilized for warming, and 3.4% from hydroelectricity. New renewable (little hydro, present day biomass, wind, sunlight based, geothermal, and bio fuels) represented another 3% and are developing quickly. The portion of renewable in power age is around 19%, with 16% of worldwide power coming from hydroelectricity and 3% from other new renewable. This article is a contextual investigation to introduce the socio-economic effects of introduction of renewable energy to supplant the regular feul sources.

Key Words: energy providers, Sustainable, inexhaustible, downpour, tides, geothermal intensity, worldwide.

The later is a delectable regular asset and its use cause a lot of unsafe effect on climate This does not assume that project appraisal can never proceeds based on valuation and aggregation at market prices. However, under the theme of the sustainable development, with its four dimensions (economic, technological, environmental, and human development) any conceivable project requires to be subjected to a cost benefit analysis. In words almost all projects include some of its consequences under either external costs or benefits, where market prices are regarded as inappropriate and the cost benefit analysis should be applied using the appropriate social prices. This study generates a case study model for social project appraisal that simulates the socio-economic evaluation of a deplorable resource and environment protection from pollution effects. The model evaluates a project that generates an "environmental friendly electrical energy" using "Hydroelectric". The external costs avoided by substitution of non-polluting hydroelectricity for fuel-fired electricity are benefits to be attributed to the project, as are the depleted fuel resource savings. It was quantified in the model in terms of.:

I. Access a cheap clean renewable source of energy,

II. Save a deportable natural resource (conventional fuel), and

III. Reduces the morbidity and/or the probable premature death. It also, preserves water for irrigating additional newly reclaimed land for agricultural production. Even though, the model in this study is restricted to evaluate the feasibility and validity of the first three outcomes. It should be mentioned that The applied appraisal model concerns the relative prices, rather than the absolute prices. If the general price level is constant, absolute and relative prices are the same. Therefore, in cost benefit analysis, any anticipated movements in the general price level, but not in relative price, should be ignored.

Direct Costs of Renewable Energy- The quantities of inputs, which are required during construction, at all stages, are valuated using market prices. It is assumed that in terms of inputs for construction, maintenance, and shutdown, the market prices are appropriate for social valuation. This assumption would not necessarily be appropriate in all conceivable circumstances. For example if the project was established on a "natural reserve region". Estimates of the construction costs are $200 million for the first 5 years. The running and maintenance costs at market price reach $0.5 million a year over the 4 successive 45 years after establishment. The average electricity output will be 6,570 GW//h. GW/h stands for gaga watt/hour. A watt is a unit of power, equal to 0.293 Btu "British Thermal Unit" per hour, which is the amount of energy required to raise the temperature of one pound of water one degree from 3

I S S N NO.-2347-2944 (Print)
e-I S S N NO.-2582-2454 (Online)
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to 4UC. Giga stands for 10 watts. The planning assumption is to create such volume of electricity a year for 45 years. However, the investment costs are not fully allocated for electricity generation, it is mainly for saving water for additional aricultural establishmet.

Direct Benefit from saving the Conventional Fuel Costs- By building a hydroelectric plant the electricity supply system reduces its fuel costs for meeting the given demand for electricity to the extent that output from the hydroelectric plant would be of zero fuel cost ,when displaced from conventional energy plant (oil) and allocated to hydroelectric energy. In practice, determining the quantities of savings of the conventional fuel attributable to the hydroelectric plant should involve the modeling of the entire electricity supply system. Then the output from the proposed plant displaces oil, implied valuation of the depletable resource savings. The quantity of the saved oil input depends on the thermal efficiency of the burning power stations. A widely used ready reckoned factor as a conversion factor was used. The average electricity output will be 6,570 GW//h. GW/h stands for gaga watt/hour. A watt is a unit of power, equal to 0.293 Btu "British Thermal Unit" per hour, which is the amount of energy required to raise the temperature of one pound of water one degree from 3 to 4UC. Giga stands for 10 watts. The planning assumption is to create such volume of electricity a year for 45 years. The "Ready Reckoner' conversion factor used is 500 tons of fuel to generate 1 GW/h of electricity. The operating rate a year is 75%. It means that the hydroelectric plant reduces (saves) 3.285,000 tons of fuel per year. The market price of fuel is $40 per ton in the base year of the project. External Benefit from Saving a Depletable Resource The market price of petrolum oil is not the appropriate social valuation per ton of input saved. There are two reasons for this assumption:

(1) petrolum oil is a nonrenewable resource,

(2) Burning petrolium oil to generate electricity, gives rise to external costs.

The natural resources economic concept implies that such continuous consumption of a depletable resource (petrolium oil) would increase sharply its scarcity. It implies that efficiency in inter-temporal allocation requires that the price of a non-renewable resource rises over time at a proportional rate equal to the interest rate, assuming constant marginal' extraction costs. Since the cost benefit analysis is concerned with efficiency in allocation, the value of coal saving in each year of the project's life should be at the price corresponding to efficient inter-temporal allocation. Although, during the most probable outcome of this model, the price of petrolum oil 5 rises at a proportional rate equal to the interest rate, in more detail model other dimetions should be considered. These are:

(a) The change in interest rate,

(b) The extraction costs, and/or,

(c) The vast new petrolum oil deposits that may discovered The Coal price is assumed to rise annually at a proportional rate equal to 5 percent interest rate. The following equation is used to generate the annual coal price in the successive future years: Pt = P0 (1+r) T. Where, Pt = Coal price in the target year t, P0 = the price in the onset year, T is the number of years between P0 and Pt Therefore: Pt = $40 (1+0.05) T Avoidance of pollution is a positive externality It is well known that burning conventional fuel to generate electricity gives rise to pollution problems especially atmospheric pollution. Qualification of arising benefit is so difficult. The atmospheric pollution from compustion of the conventional fuel such as petrolum products has adverse effects on material structures giving rise to corrosion and to the burden of required cleaning costs. it has a l s o , adverse effects on plants and animals including man. In quantitative terms, most research attention has focused on the effects on human health. This is should not to be taken to imply that the other effects of atmospheric pollution due to coal combustion are trivial, but, clearly, there is much uncertainty involved. The impacts of acid-rain problem is a clear evidence. considering human health effects, the estimating costs attributable to the burning of Solar fuel to produce electricity is two-stage process:

(1) To quantify the health effect: Such stage includes much uncertainty and it requires a great deal of research effort. The health effects express increasing morbidity (disease incidence) and mortality due to fuel

ISSN NO.-2347-2944 (Print)
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combustion. Relatively little is known about the former, accordingly, the study regards only here the probability of increased mortality as the only estimate that has significant published research output. Estimate of health effect is based upon the mortality effects of the various pollutants emitted from conventional fuel combustion. Thereof, it was derived from the emissions from a typical one GW/h plant operating at 75% load-factor, which means that the plant is running 75% of the year. The applied estimate was 80 extra deaths per year attributable to plant operation. However, the range of estimates for the excess mortality, attributable to such 6 a plant, in the literature, was from 10 to 100 persons a year. Since there are 365 days in the year and 24 hours in a day, one GW/h plant operating at 75% load-factor sends out 6570 GWT per year. This is the estimated average yearly output of the hydro plant, which would mean 80 fewer premature deaths per year. (2) Social valuation of Reduction in Mortality: The second stage is Putting a value on human life. It is a difficult area for discussion. The basic principle here is as elsewhere that social valuation should reflect willingness to pay. Now clearly, if an individual is asked what he would be willing to pay to prevent his owns certain prospect death, his answer will be the largest sum of money on which he can lay his hands. However, development plans do not give rise to the prospects of certain life or death for specific individuals. Rather they give rise of decrease or increase in mortality rates of the whole populations, and hence to changes in the probability of death for individual members of that population. Individuals can and do make choices which involve changes in the probability of death, as for example, when they travel by car rather than walk in urban areas, demonstrating that they value time saved more than the increased probability of death. In principle, then, one can infer willingness to pay for changes in the probability of death from observed behavior. The implementation of this principle is difficult. One approach, which has been adopted, is to look at wage rate differentials across occupations of varying degrees of riskiness. Other things equal, it is an observable fact that wage rates are higher for riskier jobs. Although few studies about this subject have been done, the range of variation in the values they estimated for a human life is rather large. Although it is a difficult and contentious problem, it is a vial appraisal for environmental impacts of development. Accordingly, it is impossible to be avoded. If a project appraisal does not involve changes in the probability of premature death for members of the population of the beneficiaries, then it is implicitly ingnored valuing human life. The net benefit of such project does not consider premature death as social costs. It is in fact reflects the society willing to accept such net benefits as a trade off against the expected premature deaths of a certain numbers of its population. If the argument is that premature deaths cannot be traded off against benefits to society under any circumstances, it means that this project should be rejected, what ever the large net benefit is. As positive way of thinking to pay an amount of funds accepted by the society to protect population from premature death attributed to the project implementation, such it should be less than the project's net benefits. The study used an average across countries and across occupations, of the increase in the annual wage due to the probability of premature death, although the range of variation in the estimated values is rather large. Thereof, the study derived an adjusted scale that deffrintiate between the skill requirements and unpleasant working conditions.It is that an increase in the risk of premature death of 0.001 in the probability 7 of premature death is associated with an increase in the annual wage of $100 (the literature estimates ranged from $28 to $5,000). It is assumed that this $100 is the compensation required by a typical individual for an increase of 0.001 in the probability of premature death. Therefore, the total willingness of 1,000 people to pay for a 0.001 reduction in the probability of death would be $100,000. Consequently, it means one fewer premature death. Then $100,000 would be taken as the social valuation of the saving of one life.. Accordingly, for 80 expected premature death attributed to the fuel compustion for 1-GW/h of electricity production, means $8 million dollars a year.

SUMMARY & CONCLUSION- The study provides the basic parameters and technical coefficients of the cost benefit analysis model for the socio-economic and environmental impact of introducing a renewable energy source (Hydroelectric) that replaced the conventional depleted fuel source. The study applied this model for quantitative

ISSN NO.-2347-2944 (Print)
e-ISSN NO.-2582-2454 (Online)
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fuel for a renewable energy source. It shows that the avoidance of premature mortality is the main source of benefits, even though it is an external benefit, which in most feasibility studies is ignored 8 Table 1 Basic Parameters and Technical coefficients of the Cost Benefit analysis Model: Technical Coefficient Value Unit Running costs/year 0.5 Million $ Reckoner conversion factor 500 Tons Electricity out put/year 6,570 Giga Watt/h Reduction in conventional fuel burn/year 2.628 (000) tons Price/ton of coal 40 $ Interest rate 5% % Load factor of electrical plant 75% % Plant operating capacity/hour 1 Giga Watt/h Premature deaths per year* 80 Person An increase in the annual wage due to the probability of premature death 100 $ The social valuation of the saving of one life 100,000 $ Table 2 A Profile of the Cost Benefit Analysis of Utilization of the Renewable Energy Item Present Value Fuel savings* 3.379 Pre Mature Mortality Reduction 111 Total benefits 114.379 Costs of Hydroelectric Energy 19.2 Net Present Value 95.179 B/C Ratio 5.96 * such value includes not only the direct cost but also the additional external costs which reflect the depletion charctristic of th conventional fuel (Petrolim or Coal) as a natural resource.

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