

Consider a poor rural household that uses three kerosene lanterns with the following data:

a) cost of lamp Rs 100

Life 5 years

Annual O& M cost Rs 20/year

Usage: 4 hours/ day (20ml/hour)

Price of kerosene: Rs 35/ litre (market price)

Replace by solar PV lantern:

Capital cost: Rs 550 (life 10 years)

Rs 150 (battery -2 years)

a) Consider a household that uses kerosene. Calculate the annual cost and the CO<sub>2</sub> emissions for each kerosene lantern and the viability of replacement with solar. (Use a residential discount rate of 60 %)

b) Consider the impact of having a subsidy on kerosene (Rs 18/l). Does this affect the viability?

c) Compute the cost of lighting for each solar lamp. If the model was to have a lease model, calculate the effective monthly payment. Use a government discount rate of 10%.

d) If the effective household subsidy is to remain constant, suggest a model for capital subsidy for reductions in lease payments.

e) Would you recommend complete removal of the kerosene subsidy? What may be the issues in implementation? Any likely disadvantages of the solar lantern?