Economic Analysis of Tube well driven Sprinkler irrigation and Furrow irrigation for Agriculture in Haryana, India

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Background:

India is facing water scarcity and micro irrigation techniques are considered to mitigate the water scarcity through water saving, reduction in irrigation costs and increase in the irrigated area. The sprinkler irrigation system is one such technology introduced in Haryana in late seventies and considered as suitable for region because of sandy soils which possess high infiltration rate.

Research Objectives:

1.To determine the effect of sprinkler irrigation on farm income and

2.To examine economic feasibility of sprinkler irrigation.

Methodology: This study based on primary data which was collected through farmers' interview-

Study area : Haryana state – Districts - Bhiwani, Mohindergarh, and Gurgaon , India.

Collection of data : Multistage sampling technique

Analytical Tools: **Depreciation** = Original value – junk value /Year of useful life

Net Present Value: $$NPV = \frac{R_1}{(1+r)^1} + \frac{R_2}{(1+r)^2} + \text{---------} + \frac{R_{n-1}}{(1+r)^{n-1}} + \frac{R_n}{(1+r)^n}$$

Where, R1, R2,---------- ,Rn are the net returns in period 1, 2, -------,n, respectively; n is the life in years, r is the discount rate and NPV is net present value of returns R1, R2 ,---------, Rn.

Pay back period: $\sum_{i=1}^{n} Ri = K$ Where, Ri is net returns in i th year, K is cost of sprinkler sets.

Results:

Economic feasibility of pump set irrigation and sprinkler irrigation (1 Euro =60 Rs.)

Particulars	Pumpset (Rs.)	Sprinkler set (Rs.)
Additional income from farm due to pump-set.	9918	20098
Additional expenses a.Due to depreciation b.Repair and maintenance c.Due to annual interest Total cost (a+ b+ c)	3420 2263 9054 14737	2946 1658 6630 11234
Net return	Nil	8864
Installment of loan when 25 per cent subsidy is given @ 12 per cent (interest), recovery period is 6 years.	-	7735
a)Installment of loan when no subsidy is given, and interest is @ 12 per cent and recovery period is 6 years. b)Installment of loan when no subsidy is given and interest is @ 12 per cent and recovery period is 10 years.	-	10313 6188

- The Net Present Worth @ 12 per cent discount rate came to be Rs. 7970 (Rs 48248 - Rs. 40277)
- Benefit-cost ratio = 1: 1.978
- The internal rate of return or earning power of sprinkler set was found to be 17 percent.

Conclusions: - The economic feasibility criterion of net present value, internal rate of return, benefit cost ratio and pay back period showed that the investment on sprinkler sets was found sound and economically viable. Increase in irrigated area is only possible through introduction of sprinkler irrigation.

Refrences : Gohring, T.R. and Wallender, W.W. 1987. Economics of sprinkler irrigation systems. Journal of American Soc. Agric. Econ. 30 (4): 1083-1089.

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