IRRIGATION INVESTMENT TRENDS IN SRI LANKA

By

PARAKRAMA BANDULA ALUWIHARE

Thesis

Submitted in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

in the

POSTGRADUATE INSTITUTE OF AGRICULTURE

of the

UNIVERSITY OF PERADENIYA

SRI LANKA

Approved :

Examiner (Prof. T. Jogaratnam)

Examiner (Dr. P. Abeygunawardena)

Examiner (Dr. W.M. Thilakaratne)

June 1991.

ABSTRACT

The purpose of this study is to review the agricultural development in Sri Lanka, with emphasis on the role of irrigation in agricultural development and to analyze the trends of irrigation investments since independence.

Agricultural development process is analyzed by estimating it's primary determinants, land productivity, labor productivity and cultivated land area. Development of irrigated sector is studied indepth to analyze its contribution towards agricultural development in Sri Lanka.

Investment on irrigation during the last four decades are analyzed to study the changes in emphases. Changes in profitability of three investment opportunities, new irrigation construction, rehabilitation of existing schemes and water management improvements are estimated. Irrigation Investment Function is estimated to identify the determinants of public investments on new irrigation construction.

Cost-benefit analysis techniques are used to analyze the rates of return of different investment options. It is hypothesized that the diminishing returns to new irrigation construction, is due to the shift of irrigation construction from easier and hence less expensive sites to more difficult ones. Linear, Koyck-Nerlove and Almon polynomial lag models are tried to estimate irrigation investment function.

Growth in the agricultural production has mainly occurred through the growth in land productivity. Growth in the paddy sector has largely contributed to the growth in the agricultural sector. Development of irrigated sector and introduction of seed-fertilizer technology are the main factors that resulted in the rapid growth in the paddy sector.

Massive investment in new irrigation resulted in a rapid development in the irrigated sector. Until the early 1980s, a major portion of the annual investment (90 percent of the total irrigation investment) went for new irrigation construction. However, in the more recent times, emphasis has shifted to rehabilitation and water management improvements.

Rates of Return on new irrigation construction shows a declining trend as a result of an increase in marginal construction cost. This is as a result of the shift of new irrigation construction from small projects like the renovation of ancient abandoned tank to more difficult undertakings.

It is found that rates of return on rehabilitation and water management are indeed quite high. In mid 1980s, rate of return on rehabilitation gives 24 percent as compared to the rate of return on new construction of less than 10 percent. Rates of return on water management projects show much higher figure as 70 percent. Nevertheless,

rehabilitation and water management investments remained as the only profitable investment opportunities for the future.

Koyck-Nerlove and Almon models have identified that the rate of return and availability of funds are the determinants of irrigation investment. It is also evident that the rate of return is closely correlated with the world market price of rice.

The major policy implication of this study is that investment on new irrigation construction is no more a profitable means of increasing rice production at the present level of technology. Rehabilitation and improving management efficiency in existing schemes are the most economical investment options available in the irrigated sector to increase rice production.