

# **IMPACT OF OPERATIONAL HOLDING SIZE AND PRODUCTIVITY OF PADDY FARMS IN SELECTED MAJOR IRRIGATION SCHEMES**

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## **INTRODUCTION**

Land is a fundamental resource on which a large amount of people depend for their living. However, land holding size has been reduced in most of the parts of the island with succession of generations jeopardizing their productivity and economic viability. According to Chandrasiri (1993), allotments of 10-50 ac distributed under middle class schemes started in 1930 have gradually declined to allotments around 1.5 ac. The problem is aggravated in irrigated settlements today as present generations of this land are the members of third and fourth generations of the original settlers. Moor and Wickramasinghe (1980) revealed that fewer than 30% of the settlers cultivate lowland holdings of sizes equal to or greater than what had originally been allocated. The size of the remaining 70% or more of the operational holdings range from less than 0.41 ha to about 1.22 ha. The process of holding size differentiation has apparently taken place from its position of near equity existed at the inception of settlements. Fragmentation and parcelization are unhealthy processes in terms of using resources effectively, while they also result in management difficulties (Sandaratne 1972). Consequently, this study investigates in to causes behind the process of differentiating operational holdings and its impact on productivity in major irrigation schemes of Anuradhapura District.

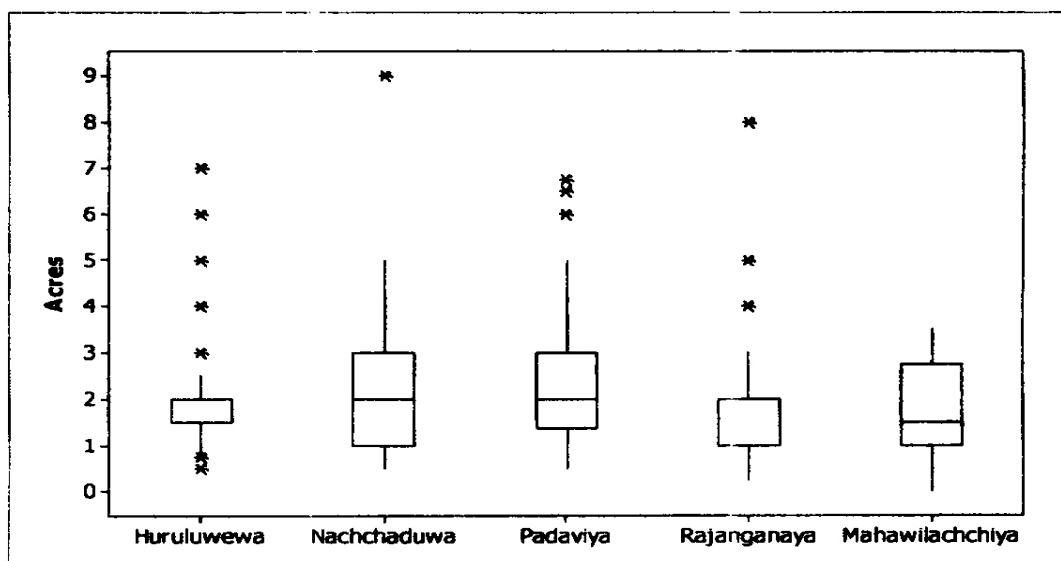
## **METHODOLOGY**

This study was conducted in 5 major irrigation schemes namely Padaviya, Huruluwewa, Nachchaduwa, Rajanganaya, Mahavilachchiya in Anuradhapura

District in 2010/2011 *Maha* season. Schemes were selected purposely considering their sizes, age, population and original allotment size. Stratified random sampling method was used to select 65 farm households. In the first stage five settlement schemes were selected. Then at the second stage all *yaya's* (Tracks) were selected along the main distribution channel in order to cover head, middle and tail of the channel. Relevant primary data were collected through a field survey using a pre tested questionnaire. Secondary data were obtained from related institutes and literature. Tabulated data were summarized in the form of graphs and tables to understand the relationships and associations whenever necessary. Correlation analysis along with multiple regressions was employed to investigate factors contributing to operational holding size and land productivity.

## RESULTS AND DISCUSSION

An apparent variation in the size of operational holdings was observed in almost all the settlements. Average holding size of Huruluwewa, Nachaduwa, Padaviya, Rajanganaya and Mahawilachchiya are 1.86, 2.28, 2.49, 2.01 and 1.68 ac respectively and it ranges from 0.25 to 9 acres as a whole. However, 72%, 22% and 06% of respondents operate holding sizes of <2, 2.1 to 4 and 4.1< ac respectively. Accordingly, there is a trend towards the fragmentation over polarization. A comparatively expedited fragmentation was observed in Huruluwewa and Mahawilachchiya schemes (Figure 1). Mean holding size of these two settlements has decreased nearly by two folds. That could be attributed to their initial allotment size and population pressure with the age of settlements compared to the other settlements.



**Figure 1- Variation of Operational Holding Sizes of Five Settlements**

The results of the regression analysis to determine the operational holding size was best fit to data with  $R^2 = 0.69$  and signs were as of the theory. Availability of family labour has positive and significant impact on the size of operational holdings. Similarly the share of off farm income affect negatively (a proxy for off farm employment opportunities) on area operated. This implies that if there's no developed off farm economy, surplus labour either retain in agriculture sector or move out from agriculture. As employment opportunities are created in the non-agricultural sector, migration out of agriculture will occur. These findings are consistent with Kalantari and Abdollahzadeh (2008). Further, size of the land rented out by the household has significant negative impact on operational holding size indicating that rental land transactions seems playing a significant role in reallocating lands of these settlements.

Regression analysis conducted to determine the factors affecting on productivity is consistent with the hypothesized relationships with  $R^2 = 0.754$ . According to the regression result holding size demonstrated strong negative impact on productivity. Similar result was observed by Kiani (2008). Reasons for the high productivity in small farms would be intensive labour use and efficient irrigation management. Farmers operating medium size lands have used inefficient combinations of inputs. On the other hand resource wastage is high in large farms due to high amount of capital use and difficulties associated with supervision. Cost of land preparation also has impacted negatively on productivity. This could be attributed to weaknesses in land preparation such as low quality and inability to complete on time. Further, though it is not frequent, flood caused by heavy rains has impacted on productivity severely in the *maha* season concerned. In addition to the damages caused by flood, heavy rains causes low productivity by poor pollination resulting unfilled and half filled grains. Number of both family and hired labour has a positive significant impact on productivity. As long as the supervision of hired labour takes place when both family and hired labour work together, the problem of moral hazard decreases while the labour productivity is increased. Further, careful supervision of hired labour by family labour is effective in small holdings. All these leads to intensive labour use ultimately leading to increase in the productivity. Furthermore, number of water issues also has influenced positively on productivity indicating the necessity of water at seedling and milking stages of the crop.

## **CONCLUSIONS AND POLICY IMPLICATIONS**

A great inequality of operational holdings and fragmentation is common in all settlements concerned. It was observed that household labour supply, land market operations and off farm income opportunities as drivers of the variation of operational holdings. Therefore, land distribution policies should carefully

take in to account these factors in determining appropriate holding size to be distributed among allottees. Establishment of industries in these settlements is a timely need to absorb surplus labour since agriculture sector alone cannot accommodate them all. The productivity is influenced by holding size, amount of labour, cost of land preparation and irrigation. Relaxing conditions put on land transactions in settlements by land development ordinance would be effective in ascertaining productivity since it provides the way forward in finding lands for those who are productive in operations and having surplus labour but no land.

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