ABSTRACT

Paddy is one of the major crops cultivated in Asian Countries (Anantachar et al. 2013). Agricultural engineering researchers and manufacturers have developed different farm equipment and machineries for sowing, planting, weeding, harvesting and threshing for paddy cultivation. Particularly, the paddy cultivating equipment and machineries namely transplanter, weeder, harvester and thresher which were developed by the researchers are largely used by the farmers in paddy fields. However, a careful study would indicate that these farm equipment and machineries are largely used by the farmers with high financial strength. This is due to reason that these farm equipment and machineries are either partially or fully automated and hence, than prices are so high to prevent their usage by the farmers who are financially weak. Because of this situation, farmers with poor financial strength use manually operated farm machineries. However, the value of these manually operated farm equipment and machineries is poor in comparison with that of the partially or fully automated farm equipment and machineries. Hence, researches are required to enhance the value of manually operated farm equipment and machineries which are used by the farmers who are financially weak. This kind of research has not been reported in literature arena. In order to overcome this practice oriented research gap, the doctoral work reported in this thesis was carried out.

Improvising the machineries used for transplanting paddy and removing weeds in paddy field fell within the scope of the doctoral work reported in this thesis. Further study in this direction revealed that it would be prudent to apply value engineering job plan to improvise the manually operated farm machineries used of transplantation and weed remover in paddy fields. Subsequently, two farm machineries namely six row manually operated paddy transplanter and single row manually operated cono-weeder were chosen as the candidate farm machineries for applying value engineering job plan. Then, three investigations

were conducted to examine the feasibility of enhancing the value of these two farm machineries.

While conducting the first and second investigations, the value engineering job plan was applied to improvise the value of six row manually operated paddy transplanter. While conducting the first investigation, six ideas were chosen for adoption. By implementing these ideas, the cost and weight of the six row manually operated paddy transplanter were reduced. While carrying out the second investigation, five ideas were chosen for adoption. According to one of these ideas, the six row manually operated transplanter was transformed into four row manually operated paddy transplanter. On implementing these ideas, the weight of the paddy transplanter reduced while its manufacturing cost negligibly increased. While conducting the third investigation, value engineering job plan was applied on single row manually operated cono-weeder. While conducting this investigation, four ideas were implemented. On implementing these ideas, the weight and cost of the single row manually operated cono-weeder were reduced.

The results of conducting the three investigations indicated that value engineering job plan is a feasible approach for enhancing the value of manually operated farm machineries. However, these results indicated that a road map is necessary for successfully applying value engineering job plan on farm machineries. This is due to the reason that the currently available value engineering job plan is highly feasible for implementation manufacturing companies. Certain features of this current value engineering job plan are not suitable for enhancing the value of manually operated farm machineries. In this background, at the end of pursuing this doctoral work, a road map consisting of fourteen steps for improving paddy farming machineries by applying the value engineering job plan was designed. This road map can be followed by the engineers to enhance the value of manually operated farm machineries.