



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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Thesis Title: Design Intervention for Mechanisation of Tealeaf Harvesting to Improve Productivity and Efficiency
(A case study of an improved harvesting device in the context of Assam, India)

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Key words for description of Thesis Work : Product design, tea-harvesting, agricultural engineering, tea plucking

SHORT ABSTRACT

The Indian tea industry is one of the major foreign revenue earners for the country. It is one of the major employers of women. Many of the activities, especially the tea-leaf plucking activity (constituting 40 percent of the total cost of production of tea leaves) performed by the women workers. The tea industries of Assam, in are facing revenue losses during recent times. One of the main factors is shortage of workforce engaged in field operations. Studies have shown that acute shortage of workforce takes place in the tea plucking activities during peak season due to various socio-economic reasons. Due to the manpower shortage, a considerable quantity of available tea leaves for tea making remains unplucked. This directly affects the overall production of made tea and hence on the revenue earnings by the tea gardens. In this scenario, the only suitable solution to the problem appears to be the adaptation of mechanised harvesting. The purpose of this research is to formulate a solution for mechanised harvesting which should be economical and suitable for tea gardens of Assam. To accomplish the stated purpose; a combination of research methods featuring literature survey, questionnaire, direct observation, one to one interview for data collection; statistical analysis of the gathered data, work study technique, virtual human modelling and simulation, prototype development and testing has been used. After gathering necessary information, it was felt that for tea gardens of Assam, a single operator handheld battery-powered rotary type tea harvesting machine with high productivity in comparison to presently available machines with a similar mode of operation will be the best solution. The prototype of the proposed machine was developed at Department of Design, IIT Guwahati and field trials were carried out at Dolaguri Tea Estate located in Numoligarh, Assam with a participatory approach. Through these field trials, it was found that the newly designed machine was efficient and had higher productivity compared to hand plucking. While the field trials were carried out, it was also found that the machine was safe for operation from the point of view of safety, user-friendly and design was thus efficient. Keywords: Product design, tea-harvesting, agricultural engineering, tea plucking,