INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.

Thesis Title: **Study of a concurrent development- dissemination model for appropriate technology: Case of improvised *Chaak* for pottery industry**

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Thesis Submitted to the Department/ Center	:	Centre for Rural Technology
Date of completion of Thesis Viva-Voce Exam	:	29/11/2020
Key words for description of Thesis Work	:	*Anthropometric measurements; Ergonomic design of machine; Sustainability-orienting design (SoD), Appropriate technology; Technology transfer; Bottom of the Pyramid (BoP)*

SHORT ABSTRACT

In the present research endeavour, an attempt is made to redesign traditional Pottery wheel with consideration of ergonomic principle and the local people's anthropometric data. Target users' anthropometric data are the prime requirement for successful design intervention. However, paucity of anthropometric data of target users from Assam, India, is the major concern. To bridge the void, an attempt is made here to gather and to analyse the anthropometric data of five ethnic groups (Boro, Garo, Hira, Karbi, and Rabha) from Assam, India.

Seventy-two anthropometric body dimensions, including the age and body weight of 453 people from different districts of Assam, India, are summarized. The variation in anthropometric data considering gender and ethnic diversity is also examined, and significant differences are observed in relation to gender and ethnicity. T-tests are carried out to verify the statistical significance of the variations in anthropometric dimensions across ethnic diversity within the same gender. Factor analysis and regression modelling are also done as part of the study.

Further, the collected data are used to redesign the traditional Chaak i.e. traditional pottery wheel (TPW) and, cater to their comfort with added safety. *Treadle mechanism* is skillfully adapted in the machine. A four-bar crank rocker mechanism is constructed to obtain the necessary motion. In deciding the different parameters of the four-bar planner crank rocker mechanism, anthropometric data of the target users are considered. A full-scale model of the Improvised Pottery Chaak (IPC) is fabricated and field tested. The field-testing results clearly demonstrate that the design intervention is successful in reducing the health discomfort and energy expenditure besides reduction of increased heart rate. Male

artisans' average productivity is found to be almost 1.7 times higher in the case of IPC than that of the TPW. Similarly, female artisans' average productivity is found to be almost 1.8 times higher in the case of IPC than that of the TPW. The product along with its manufacturing process is successfully transferred to three rural micro-enterprises. Manufacturing process details and maintenance-related issues are demonstrated to them. In the absence of a structured approach and institutionalized intervention, such technology design and innovation efforts do not cater to the needs of the marginalized people living at the bottom of the pyramid (BoP). Hence, in this study, based on the experiences gathered from technology transfer of IPC, an effort is made to study technology transfer framework involving rural micro-enterprises.