

**SHORT COMMUNICATION**

**Importance of Need Based Agricultural Implements and Equipments in Drudgery Reduction among Rural Farm Women**

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In India the agricultural sector is the largest employer of women. Majority of the female workforce (83%) works in rural India. women make up 32 % of the total workforce in the Indian economy. A very large share (73%) of this female workforce toils in the agricultural sector (self-employed) approximately 103 million in number, of which mostly (96%) are in rural areas. 55% of female agricultural workers are casual labour, reflecting their poorer land holding status (27.5%). Farm women found working for 14-18 hours while in lean period it came down to 14-16 hours. Reportedly more than 50 per cent of all female agriculture worker are unpaid family workers and rest receive wages below statutory minimum with widening

gender gap in wages in last decade. Particularly for task which are specialized by women probably due to the illiteracy of overwhelming majority (70 per cent) with only 4 per cent having at least secondary school qualifications. Further, farm women were found taking rest from 1-3 month during carrying stage before the delivery of their children whereas 14% had delivered their children without availing any rest. Women are found active in all operation and activities in agriculture and allied sectors but are concentrated in cultivation to household survival and food security. However, it has been divulged that they work under severe limitation due to their subordinate position in society and the market.

Anthropometry, when applied to agriculture, is used to study interaction of farmers with tasks, vehicles, tools, equipment, and personal protective equipment—intended to determine the degree of protection with enhanced health, productivity and minimized drudgery. For efficient use of agricultural tools and equipment, good knowledge and appropriate design of agricultural machinery is required, with special consideration to efficiency, safety and comfort of its users. Anthropometric dimension are one of the major factors to consider while designing tools and

equipment. The design and dimensions of agriculture tools and implements have a great bearing on the body dimensions and physical built of the users, requiring compatibility essentially between machine devices and worker body dimension (which varies with, age, sex, ethnic groups). Hence, it is required to collect anthropometric data different regions of the country through extensive surveys for designing appropriate farm equipment and tools<sup>[2]</sup>. Researches states that anthropometric data surveys carried out in India were limited to the male agricultural workers only<sup>[1]</sup>. Due to death of female

anthropometric data, male anthropometric data was often used for women at work wherever necessary, assuming that it would also benefit female workers. Inappropriate anthropometry would aggravate occupational risk factors in agriculture such as static positioning, forward bending, heavy lifting, kneeling and prolonged contact of vibratory equipment, which result in musculoskeletal disorder such as disorder of the back and neck, nerve entrapment syndromes, tenosynovitis, tendonitis, peritendonitis, epicondylitis and non-specific muscle and forearm tenderness<sup>[10]</sup>. Inappropriate design and excessive use of hand tools were found associated with prevalence of both acute and sub-acute cumulative trauma of hand, wrist and forearm among farm women. It was only in recent past, when some steps have been taken towards women anthropometry<sup>[8]</sup>. It has been observed that collected women anthropometric data from north eastern hill station of India, were found to be lesser than of eight other countries namely, America, British, China, Egypt, Japan, Korea, Mexico and Taiwan. Collected data was intended to be used for design // modification of agricultural hand tools/implements/machinery, for drudgery reduction and at the same time increase efficiency, safety and comfort of operators in hill agriculture<sup>[2]</sup>. Impact of ergonomically designed tools and drudgery reduction. Drudgery is conceived as physical and mental strain, agony, monotony and hardship experienced by human beings. However, women report more fatigue than men. So, the plight of Indian farm women in this regard is alarming as they work for long hours without leisure, perform multiple roles in family and continue to be constrained by illiteracy, malnutrition and unemployment. This fatigue concerns mental and physical

fatigue, sleepiness, feeling tired or emotional exhaustion. Almost all farm women suffer from physical drudgery in various operations. Drudgery load on farm women can be described under various factors such as Physical Load, Postural Load, Repetitive Strain Load, Time Load and Musculoskeletal Disorder Load. Designing equipment and tools with respect to an individual sex (male female), is likely to be inaccurate due to obvious anthropometric, physiological and biomechanical difference. For comfortable usage of tools, improved work efficiency. And to minimize risk of musculoskeletal injuries, it has been advised to design/modify hand tools and equipment dimensions of concerned operator, i.e. women Researchers of ICAR institutes<sup>[4, 12]</sup>. Look an initiative toward introducing various time and Energy saving tools, which resulted in reduced<sup>[7]</sup>. A study focused upon inquiring adoption level of women friendly improved equipment<sup>[11]</sup> and farm tools Based on ergonomic studies, 20 hand operated improved farm tools and equipment viz. CIAE fertilizer broadcaster, hand rider, seed treatment drum, TNAU four row paddy drum seeder, CRRI two row and four row rice Trans planters, conoweeder, twin wheel hoe, improved sickle, groundnut stripper, groundnut decorticator (sitting and standing type), tubular maize sheller rotary maize sheller, cotton stalk puller (wheel type), CRRI paddy winnower, OUAT pedal operated paddy thresher, and CIAE hanging type grain cleaner with perform various farm Operations. Thus, these tools and equipment, designed with for increasing efficiency and reducing drudgery<sup>[3,6]</sup>. Tools and equipment, designed with an intention to reducing drudgery, namely groundnut decorticator, hand ridger, improved sickle and tubular maize sheller were improved sickle and

tubular maize sheller were introduced among two different groups of farm women in Post-harvest handling and processing on usage. These tools and equipment were found efficiency and work output among women agricultural workers<sup>[8]</sup>. Similarly, technically prepared serrated sickle mechanized cotton picking activity, fodder collector when tested on farm women to improve work efficiency and to reduce the drudgery of women, resulting in increased work efficiency<sup>[5]</sup>. Muscular stress of selected drudgery prone activities (milking of animals, cleaning animal shed, weeding, harvesting, mud plastering of house etc.) was evaluated using traditional and improved tools for farm women. Improved tools resulted in enhanced work posture, working efficiency, health with reduced muscular stress. A comparative assessment of

traditional tools (i.e. khurpi and hoe) and improved garden tools (i.e. circular blade weeder, garden rack, and hand fork) was done on the basis of economic viability and physiological workload of women. Acceptability of improved tools among farm women was higher than of traditional tools as improved garden tools resulted in less labour cost, less energy expenditure and reduction in physiological fatigue<sup>[7]</sup>. Hand operated maize dehusker-sheller was ergonomically evaluated to assess the physiological workload and its performance in sitting and standing postures and it was found that ergonomic designed equipment reduced physiological and economic costs<sup>[9, 10]</sup>. However along with improvised tools for harvesting operations were willing to purchase improved tools which are in improving efficiency and reducing drudgery<sup>[12]</sup>.

## References

1. Dewangana, K.N., Owarya, C. and Dattab, R.K. (2008). Anthropometric data of female farm workers from north eastern India and design of hand tools of the hilly region. *International Journal of Industrial Ergonomics*, 38(1): 90-100.
2. Dixit, Jagvir, Namgial, Deldan., Sharma, Sushil., Lohan, S.K., and Kumar, Dinesh (2014). Anthropometric survey of farm worker of Ladakh region of India and its application in equipment design. *Agricultural Engineering International: CIGR Journal*, 16(2):80-88
3. Gandhi, S., Dilbaghi, M., Bimla (2009). Harvesting of Bajra (Pearl millet) Cobs by farm Women of Haryana An Ergonomic Study. *Journal of Agricultural Engineering*, 46(2):1-13.
4. Kaur, Balsharanbir and Sharma, Shivani (2015). Ergonomic Assessment of Conventional and Mechanical Methods of cotton Picking. *Agricultural Research Journal*, 52(1):33-36.
5. Kaur, Harpinder and Sharma, Shivani. (2011). An Ergonomic Study of Fodder Collecting Activity Performed by Farm Women of Punjab of *Progressive Agriculture*, 2(2):29-33.
6. Mukherjee, S. (2014). The 'invisible' workers: women and work in the informal economy. *ZENITH International Journal of Multidisciplinary Research*, 4(9):24-43.
7. Sharma, B., Gogoi, M., Battacharjee, A.M., R., Deka, B., U. Goswami (2015). Improved farm tools for women worker to increase productivity and reduce drudgery: an assessment. *Asian Journal of Home Science*, 10(1): 144-148

8. Singh, S.P., Gite L.P and Agrawal N. (2006). Physiological workload of farm women while evaluating sickles for piggy harvesting Gender, Technology and Development, 10(2): 229-244.
9. Singh, Surabhi, Ahlawat, Santosh, sanwalsarita Ahlawat T.R. and Gora Alok (2016).Drudgery reduction of farm women through improved tools. International Journal of agriculture Sciences,8(14):1242-1249.
10. Singh, Alka, Gautam, U.S., Singh, Rajesh and Paliwal, Dinesh. (2014). Ergonomic study of farm women during wheat harvesting by improved sickle. African Journal of Agricultural research, 09: 1386-1390.
11. Singh, Surabhi and Arora, Renu (2010).Ergonomic Intervention for Preventing Musculoskeletal Disorders among Farm Women. Journal of Agricultural Science, 1(2) : 61-71.
12. Tiwari Rekha, Tomar, D.S., Dixit, A.K. and Saxena, A.K (2015). Impact of Advanced Transport Machinery for Reducing Drudgery and work Related Stress of Farm Women. International Journal of Bio-resource and stress Management, 6(2): 254-260.
13. Vyas, Neena and Devi Laxmi (2013).Tools and Implements used by Hill Farm Women in Himachal Pradesh. International Journal of Scientific Research, 2(4): 3-6.