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Adoption of Agricultural Labour Saving Tools by Farm Women in India and Gujarat – An Overview

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Author's contribution

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: The purpose of this paper is to overview the adoption of labour saving tools by women working in the agricultural farms in India and special reference to the Gujarat state.
Methodology: The study is based on the secondary sources. A systematic methodological approach has been adopted while reviewing various related literature of India and Gujarat. The conclusion of the study is based on the systematic review analysis of key findings.
Review analysis: Farm women have been found using both traditional and improved labour saving tools. Lack of adoption of improved tools was reported in various literatures, however, the adoption level by the farm women found to increase after trainings. The gain in understanding and skill about labour saving tools increase work efficiency and save their time.
Conclusion: The study concluded that the practices of labour saving tools are not satisfactory due to the lack of awareness. The capacity building training enhance in using the labour saving tools efficiently.

Keywords: Drudgery; labour saving tools; farm women; agriculture.

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1. INTRODUCTION

Agriculture is the main source of income in rural India. Indian rural women are engaged in all agricultural practices like planting, harvesting and post-harvesting activities. Besides these activities, they are also actively engaged in marketing activities of selling the agricultural products. All these activities are time consuming and require extensive hard work. The women are extensively contributing in various farming work is drudgery. Drudgery is usually envisaged as physical and mental strain, distress, monotony and hardship experienced by farm women while performing these farm operations [1]. Various tools and equipment have been designed and developed are made available to the farmers for performing various agricultural practices. The introduction and adoption of drudgery reducing farm technologies helps to lighten the sufferings of women in farm operations and to enable them to participate more energetically and enthusiastically [2]. Therefore, it is essential for the women working in agricultural farms to adopt labour saving technologies to reduce their drudgery and ease the farm operations for improved and productive output.

1.1 Objective

To review various literatures related to the adoption of labour saving tools by women working in the agricultural farms in India and Gujarat is the objective of the present study.

2. METHODOLOGY

The present research is based on the various secondary sources such as thesis, published articles in various international and national journals and reports of government and educational institutions of agriculture departments, mostly available online. A systematic methodological approach has been adopted while reviewing various related literature. After reviewing each relevant literature, the findings and conclusion has been analysed and compared. The conclusion of the study is based on the systematic review analysis of key findings.

3. REVIEW OF LITERATURE

The review of literature has been presented in the following three sections:

3.1 Drudgery Reducing Tools and Equipments used by Farm Women in India

Drudgery in farming operations is an important gender issue and efforts are under way by research and development and development agencies to develop and popularize such tools and equipment among farming community [3].

According to Khadatkar, Abhijit, et. al., [4], most of the activities perform by women include sowing, transplanting, weeding, harvesting, threshing, and winnowing which are very drudgery prone. The traditional tools used by women workers involves operating in bending or squatting posture which cause drudgery and lead to serious health issues such as back pain and knee pain [4]. Considering the aspects, a number of farm-tools and implements have been designed and developed by research organisations and state agriculture universities [4].

The tools/equipment available for different farming operations were designed earlier for men workers keeping in mind male dominancy in Indian agriculture environment and same was given to women. However, women faced technological difficulties in operating these tools, causing serious occupational health problems. This found to reduce work efficiency [4].

For several decades, development practitioners have explored water, energy and farm-related technologies and practices that can contribute to reducing the burden of rural living, in particular for rural households and communities under labour stress [5]. Table 1 was developed to illustrate household and agricultural tasks typically carried out by rural women in low-income countries, and their corresponding technologies and services with labour-saving potential [5].

3.2 Adoption of Labour Saving Tools by Agriculture Farm Women in India

Women are lagging behind in the use of improved technology and equipments at farm. This causes significant physical, mental exhaustion and other health problems [6]. The prime reason for these problems are lack of knowledge of technological techniques of using and performing task [7].

Khadatkar, Abhijit, et al. [4] mentioned in his study that research organisations and agriculture universities of states of India have designed and developed the tools, such as Hand Ridger, Naveen Dibbler, Grubber Weeder, Fertilizer Broadcaster, Four-Row Paddy Drum Seeder, Two-Row Rice Transplanter, Cono-weeder, Twin Wheel Hoe, Improved Sickle, Cotton Stalk Puller, Paddy Winnower etc [4].

Saurabh et al. [6] found that in central Uttar Pradesh, traditional and very basic tools viz. sickle, *khurpi*, hand hoe, hand plough and manual chaff cutter etc. were possessed by most of the villagers, while very few of them possessed improved tools like maize sheller, chaff cutter, sprinkler, fertilizer broad caster, weeder, hand ridger etc.

Farmwomen from the unorganized sector are unaware about the new and improved technologies as these are inaccessible to them [8]. It is imperative that they are exposed to these technologies and motivated to adopt the new technologies, which would help them to improve their quality of life [8]. Under the changing dynamics, economical and industrial growth, agriculture has to undergo changes with new approaches; therefore, experiential system in agriculture has strong potential for imparting better training of the farm women with high level of skills. In order to increase the work efficiency by reducing drudgery, farm tools which women can comfortably use with safety can be provided to them [9].

The research paper of Chaudhary et al. [10] assessed the awareness and adoption of improved farm tools by the women farmers in Gorakhpur and Deoria districts of Uttar Pradesh. The results of the study found that for many years, women farmers have been using traditional tools and equipments. However, most of the women farmers felt these traditional tools as extremely drudgery while using. Though more than half of the women (63.5 percent) found drudgery reducing tools and equipments, however, low level of of awareness regarding improved labour saving farm tools and equipments were reported in the study.

Sucharita and Bishnoi [11] focused drudgery reducing equipments and their influence on the physiological workload of women and work efficiency. The equipments described in the study were mostly used by farm women for performing various agricultural operations. These equipments helped in reducing drudgery significantly thus improving working efficiency of the rural women. Though the benefits of these equipments proving to be boon to farming community, there still remains some gap between planning and implementation. Many women lack awareness about the equipments and their availability. They concluded that it is essential to make these equipments available to the farm women all over the country.

Sharma et al. [12], in their research paper based on primary data collection from Ratlam district of Madhya Pradesh had mentioned that modified technologies have significantly higher work output as compared to the traditional technology. They found that the output capacity was higher using hanging grain cleaner (129.7 kg/hr) as compared to using of traditional sieve (70.2 kg/hr). The work output was 84.7 percent for hanging grain cleaner.

A study was conducted by Lakshmi and Deepika [13]. They aimed to introduce 14 drudgery reducing farm tools and implements. These were sapling transplanter, sickle/kurpi, long handle weeders, three types of harvest bags, ring cutter, finger guards, milking stand cum stool, head load manager, seed cum fertilizer bag, seed placement tube and fertilizer broad caster. A capacity building training programme was imparted to the farm women for getting exposure to these improved set of farm tools and implements. Adoption levels were assessed after completion of a crop season [13]. It was found that partial awareness was there about the improved equipment before training and 100 percent were found aware in the random selected group after the training programs. About 62 percent of the sample has moderately adopted the given technologies. The study indicated that the capacity building training programme helped the farmers to enhance the adoption level [13]. Another study of Kaur and Singla [9] was conducted in villages of 3 districts of Punjab State. The results revealed that participation of farm women was higher in activities like grain storage, manual harvesting, picking of vegetables and animal dung collection and its disposal. Awareness level of participants regarding drudgery reduction tools was very low before trainings. After trainings, female labourers had 78.2 percent gain in drudgery reduction techniques.

Table 1. Technologies, services and practices with labour-saving potential for women in agriculture

Agricultural activities	Existing practice	Technologies, services and practices with labour - saving potential
Land preparation and cultivation	Manual land preparation, digging and weeding with simple tools and following traditional labour-intensive practices; often relying on local seeds	- Improved hoes for land preparation, planting and weeding - Tillage implements (steel mould-board plough – ripper tine – harrows and cultivators – ridgers and bed makers – levelling planks or blades) - Weed wipes and knapsack sprayers; fertilizer micro-dosers - Draught animal planers (DAPs) and weeders - Micro-irrigation (drip and sprinkler-based) for vegetable growers - Integrated pest management practices - Conservation agriculture (reduced tillage – semi-permanent planting basins – ridge, tined strip or zero tillage)
Harvesting	Simple manual tools (knives and sickles) which are often heavy and/or worn out	- Improved hand tools for harvesting cereals (scythes – reaping hooks) - Motorized single-axle mowers and reapers for harvesting cereals - Draught animal-powered groundnut lifter
Post-harvest (processing and storage)	Manual shelling, cleaning, drying and processing of crops; poor storage facilities and food packaging	- Small-scale low-cost power supplies - Draught animal-powered and motorized crop processing - Strippers and shellers (manual or motorized) - Threshers (manual or motorized) - Motorized cleaning/processing of grains and pulses - Crop processing (screw or hydraulic presses – cassava grinders) - Coffee hullers - Motorized rice hulling (rubber-roller huller – disc huller – polishers) - Motorized oil extraction - Solar drying & milling equipment (polyethylene covers) - Fish processing oven for fish drying, smoking and storing - Storage infrastructure and packaging materials (airtight storage bins)
Transportation	Travel on foot; carrying loads on body	- Intermediate means of transport (donkey or other pack animals, wheelbarrow, cart, bicycle [with trailer] – small-scale motorized transport: single-axle tractors or motorized tricycles – yokes and collar harnesses for draught animals – Hippo water roller) - Affordable and safe public transport system - Improved paths and feeder roads
Marketing	Limited utilization of ICT in acquiring market information	- Prepaid cards and mobile phone plans for weather forecasts, market price information, etc

Source: FAO (Food and Agriculture Organization), [5]

Sumita et al. [14] studied evaluated the impact of trainings given by 31 KVKs on adoption of 25 drudgery reducing technologies by rural women. The study revealed that there was a reduction in their drudgery, improvement in the output and comfort, due to the use of improved tools. The authors have recommended the need for availability of these technologies at their door step.

Sharma et al. [15] in their study revealed that weeding operationtools e.g. hand hoes or *khurpi*

in both squatting and bending position decreases the workefficiency and also observed that the same amount of work could be done in almost half of the time and work efficiency was increased by 86.3 per cent if they use improved weeders. The study of Anitha, Singh and Afifa conducted in 2019, revealed that long handle weeders, sapling transplanter, ground nut stripper and seed placement tube have reduced the back pain and improved the work output. Performance of hanging grain cleaner in wheat cleaning and grading was evaluated by Barkha et al. [16]. They found that due to the hanging grain cleaner there was less exertion, less discomfort and back pain. Another study of Kumar et al. [17], conducted in Uttar Pradesh revealed that the knowledge level of participants about drudgery reducing implements was negligible. After trainings, the farmwomen had 74.6 percent gain in knowledge and skill about drudgery reduction. Increased efficiency of the introduced tools saved their time, which they used for resting and taking better care of themselves and their children.

Sharma and Goswami [15] assessed in their study the impact of improved garden tools *i.e.* Garden rack, Circular blade weeder and hand fork on economic viability and physiological workload of women in comparison with traditional age old tools *Khurpi* and Hoe conducted in five districts of Assam comprising 40 beneficiaries and 40 non-beneficiaries. The findings revealed that less time required in all selected activities by using improved garden tools resulted less labour cost than simple Hoe and *Khurpi* [15].

Manju et al. [18] studied on five technologies i.e., improved sickle, wheel hand hoe, capron, cot bag and protective gloves which revealed that the drudgery was reduced in both men and women. However wheel hand hoe was used successfully by men in comparison to women who preferred to use their conventional technology i.e., improved long-handled hoe. Evaluation of technologies reported that improved sickle was used successfully by both men and women farmers. More than half of the men farmers (53.3 percent) and only 13.3 percent women farmers preferred the wheel hand hoe over the traditional one as they found it four times more efficient in terms of time, energy and money saving. Cot bag was preferred by the all. Capron was preferred by 80.0 percent of the men farmers, whereas women farmers did not prefer it much. One third of men (33.3 percent) and 26.7 percent of women farmers preferred using gloves while harvesting of guar and picking of cotton. The study implies that women need to be trained in using the improved technologies otherwise they find it difficult to adopt the new tool / implement [18].

3.3 Adoption of Labour Saving Tools by Agriculture Farm Women with Special Reference to Gujarat

Sumitra Sundhesha et al. [19], conducted a study to find the awareness and adoption level about drudgery reducing tools and equipment among farm women. The result of the study showed low level of awareness and low level of adoption of drudgery reducing tools and equipment was found among majority of farm women. Most of independent variables showed significant and positive correlation with awareness and adoption level of drudgery reducing tools and equipment except caste. Family type and herd size showed non-significant correlation with adoption level of drudgery reducing tools and equipment. Family size showed negative but significant correlation with awareness and adoption level of drudgery reducing tools and equipment [19].

The research paper of Ahlawat and Surabhi [20] focused on determining the acceptability of selected drudgery reducing tools by the farm women. The study also assessed the problems faced by them while using the selected tools. The data collection was conducted in two *talukas* of Banaskantha district in Gujarat. Three women friendly drudgery reducing tools were selected to assess their acceptability. The tools selected were Improved sickle, Tubular Maize Sheller and Groundnut Decorticator (Standing Type). It was found in the study that all three tools were perceived highly acceptable by high majority (91.7 percent, 85.0 percent and 86.7 percent respectively) of farm women respectively. Overall 100 percent of farm women reported facing problem of lifting of decorticator from front side during its operation especially when little more amount of groundnuts were filled in it for decorticating. In case of improved sickle, it was found that the sickle was not appropriate for the farm women who used to work by left hand [20].

Bhushan et al. [21] conducted a study in 2016 to find out awareness about the drudgery reducing farm technologies by women farm workers in Gujarat. The study had focused on assessing the awareness of farm workers about 30 technologies. The study concluded that 93 percent of the women used traditional tools and

implements for their agricultural activities. The most tedious and drudgery inducing activities were also done manually by local traditional tools like hand hoe, sickles etc.

Singh et al. [7] aimed to investigate the farm women of Dantiwada *taluka* being equipped technologically for reducing their drudgery in enhancing their agricultural productivity. It was found that farm women were involved in various agricultural and livestock activities. Majority of the women reported the activities as difficult to perform [7]. On comparing energy expenditure of farm women during performing agricultural activities in traditional practice and by using drudgery reducing tools, their energy expenditure decreased by using hand ridger (13.381 KJ/min) while it is same by using sickle (10.996 KJ/min) and maize sheller (6.703 KJ/min). It was found that energy expenditure increased by using groundnut decorticator (9.724 KJ/min) [7]. The product increased almost ten folds by using each tool. The statistical analysis revealed that energy expenditure of farm women did not increase significantly by using drudgery reducing tools as compared to working in traditional manner, whereasoutput increased significantly [7].

A study was carried out by Patel et al. [22] with the objectives to evaluate the performance of improved sickle for reducing the drudgery level. They also assessed harvesting efficiency by farm women using newly introduced and traditional tools. The study revealed that improved sickle resulted in higher harvesting efficiency than the ordinary sickle. The rate of perceived opinion for improved sickle, fall in the category of highly acceptable tool as compared to simple sickle. The results of the study showed that improved sickle was helpful in reducing the drudgery level in which physical tiredness was medium to low, time saving and cost saving compared to ordinary sickle.

4. CONCLUSION

This study based on review of various previous researches on adoption of labour saving tools by women working in the agricultural farms in India and Gujarat. A systematic methodological approach has been adopted while reviewing various related literature. The conclusion of the study is based on the systematic review analysis of key findings. The study concluded that the practices of labour saving tools are not satisfactory due to the lack of awareness. However, the adoption level by the farm women found to increase after trainings. The gain in knowledge and skill about drudgery reduction tools increase work efficiency and save their time. Hence, more efforts need to be made by the stakeholders in proving training to the farm women.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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