

Traditional Tools and Implements Used by the Koch Community of South West Garo Hills District, Meghalaya, India

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ABSTRACT

Traditional tools and implements remain integral to the livelihood systems of indigenous communities, particularly in regions where mechanization is limited. The Koch community of Meghalaya relies extensively on handcrafted tools made from locally available materials such as bamboo, wood, and cane for household and post-harvest activities. The present study was conducted in six Koch-dominated villages of South West Garo Hills District, Meghalaya, namely Dighlapara, Chamaguri, Anderkona, Sulguri, Latri, and Kumli. A total of 120 households were selected through random sampling to document traditional tools used during post-harvest operations. Data were collected through household visits, direct observation, and measurement of each tool's dimensions, weight, construction materials, and functional characteristics. The study identified a range of traditional tools used for threshing, drying, sieving, winnowing, measuring, storage, de-husking, pounding, and cleaning. Most of these implements are fabricated locally and are operated primarily by women, who play a dominant role in post-harvest activities. Despite their cultural significance and practical utility, many of these tools lack ergonomic considerations and may contribute to physical strain and musculoskeletal discomfort. Systematic documentation of these indigenous technologies is important for preserving traditional knowledge and for informing the development of ergonomically improved tools that enhance safety, comfort, and productivity.

Keywords: Indigenous tools, Koch tribe, Meghalaya, Post-harvest operations, Traditional knowledge, Women in agriculture

INTRODUCTION

Indigenous communities in Northeast India possess rich repositories of traditional knowledge related to agriculture and household management. Among these communities, the Koch tribe inhabiting the western and south-western regions of Meghalaya has retained a wide range of traditional tools and implements used in day-to-day activities. These implements are designed using locally available materials such as bamboo, wood, cane, and iron and are adapted to the socio-cultural and environmental context of the community.

Traditional agricultural tools have long supported operations such as land preparation, sowing, weeding, harvesting, threshing, winnowing, storage, and food processing. These implements are generally low-cost, easy to maintain, and fabricated by local artisans or by household members themselves. According to Das and Nag (2006), traditional agricultural tools reflect generations of experiential learning and are closely aligned with the needs and working conditions of rural communities. Karthikeyan et al. (2009) reported that indigenous tools continue to be widely used due to their simplicity, affordability, and adaptability.

Although agricultural mechanization has increased in many parts of India, traditional tools remain essential in tribal regions where access to modern machinery is limited. In the Koch community, women are the principal users of several post-harvest tools, particularly those used for threshing, cleaning, de-husking, and storage of grains.

Documentation of traditional tools is important for preserving indigenous knowledge systems and for identifying opportunities to improve tool design using ergonomic principles. Such improvements can reduce drudgery, enhance work efficiency, and minimize the risk of work-related musculoskeletal disorders.

The present study was undertaken to document the traditional tools and implements used by the Koch community of South West Garo Hills District, Meghalaya, with particular emphasis on those employed in post-harvest operations.

Materials and Methods

Study Area

The study was conducted in South West Garo Hills District of Meghalaya, India. Six villages predominantly inhabited by the Koch community were selected: Dighlapara, Chamaguri, Anderkona, Sulguri, Latri, and Kumli, located in Rerapara and Betasing Community and Rural Development Blocks.

Sample Selection

A total of 120 households were selected using random sampling, with 20 households from each village. The selected households depend primarily on agriculture and related activities for their livelihood.

Data Collection

Primary data were collected through:

- Structured interviews;
- Direct field observations;
- Photographic documentation; and
- Physical measurements of tools.

For each identified tool, information was recorded on:

- Local name;
- Purpose and mode of use;
- Construction materials;
- Dimensions and weight;
- Capacity; and
- Expected service life.

Data Analysis

The tools were classified according to their functional use in post-harvest operations. Descriptive statistics were used to summarize their physical characteristics and applications.

RESULTS AND DISCUSSION

The traditional tools identified in the study were categorized into eight functional groups.

Tools for Threshing and Drying of Grains

Darai Bari

Darai Bari is a bamboo stick with a notched and tapering end used to turn and loosen straw during threshing to facilitate grain separation (Figure 1a). It is operated by both men and women. The average length is 74.6 inches and the approximate weight is 1.5 kg.

Nawra (Naura)

Nawra is a wooden grain gatherer fitted with a bamboo handle (Figure 1b). It is used for collecting grains after threshing and for spreading and gathering grains during drying. The implement weighs between 2.2 and 4.4 kg depending on size and wood type.

Tools for Sieving and Winnowing

Chalaing

Chalaing is a circular bamboo sieve with fine perforations used to separate de-husked rice from broken grains and residual husk (Figure 2a). It is mainly used by women and weighs 300–320 g.

Changla

Changla is a larger version of Chalaing used to clean grains after threshing (Figure 2b). It has a capacity of 3–4 kg and weighs approximately 750 g.

Kula

Kula is a U-shaped bamboo winnowing fan used for cleaning grains and pulses and for drying edible products (Figure 2c). It can hold approximately 3 kg of grain and has a service life of 5–7 years.

Tools for Measuring

Don

Don is a bowl-shaped bamboo basket used to measure husked and unhusked grains (Figure 3a). It has a capacity of approximately 5 kg.

Tala

Tala is a smaller cane basket used to measure rice (Figure 3b). It holds about 1 kg of grain and can last for 15–20 years.

A larger cane basket, also referred to as Don, has a capacity of approximately 3 kg and a service life of 12–15 years.

Utility Baskets

Khushi

Khushi is a closely woven bamboo basket available in different sizes and shapes (Figure 4).

- Small Khushi: Used for serving puffed rice.

- Large Khushi: Used for washing rice.
- Cylindrical Khushi: Used for carrying maize seeds and collecting vegetables; commonly tied around the waist, especially by women.

Storage Basket

Dukik

Dukik is a square-based bamboo basket used to hold cleaned rice during winnowing and for temporary grain storage (Figure 5). It can hold up to 15 kg of grain and lasts 10–15 years.

Tools for De-husking, Pounding, and Grinding

Uron

Uron is a wooden mortar carved from a single block of wood (Figure 6a). It is used for de-husking rice, de-hulling seeds, and preparing flour. The weight ranges from 11 to 15 kg.

Gaina

Gaina is a wooden pestle used with Uron (Figure 6b). It weighs 1.7–2.1 kg and is generally used by women.

Tools for Cleaning and Waste Collection

Jharu

Two types of Jharu (brooms) were documented:

- Made from branches of the plant locally known as Bamon Mora (Figure 7a);
- Made from bamboo sticks (Figure 7b).

These brooms are used for cleaning threshing floors and household courtyards.

Chata

Chata is a V-shaped bamboo dustpan used for collecting chaff, husk, leaves, and household waste (Figure 7c). It is predominantly used by women.

Table 1. Physical Characteristics and Specifications of Traditional Tools Used by the Koch Community

Tool	Primary Material	Approximate Weight	Main Use
Darai Bari	Bamboo	1.5 kg	Turning straw during threshing
Nawra	Wood and bamboo	2.2 - 4.4 kg	Gathering and spreading grains
Chalaing	Bamboo	300 - 320 g	Sieving de-husked rice
Changla	Bamboo	750 g	Separating grains from chaff
Kula	Bamboo	550 - 600 g	Winnowing and drying
Don (bamboo)	Bamboo	400 g	Measuring grains
Tala	Cane	400 g	Measuring rice
Khushi	Bamboo	20 - 200 g	Serving, washing, carrying
Dukik	Bamboo	0.55 - 1.0 kg	Temporary grain storage
Uron	Wood	11 - 15 kg	De-husking and grinding
Gaina	Wood	1.7 - 2.1 kg	Pounding grains
Jharu	Plant branches/bamboo	400 - 800 g	Cleaning courtyards
Chata	Bamboo	500 g	Collecting waste and husk

Table 2. Estimated Service Life and Grain-handling Capacity of Traditional Tools

Tool	Capacity	Estimated Service Life
Chalaing	1.0-1.5 kg	5-6 years
Changla	3.0-4.0 kg	3-4 years
Kula	Up to 3.0 kg	5-7 years
Don (bamboo)	Up to 5.0 kg	Up to 10 years
Tala	Up to 1.0 kg	15-20 years
Large Don (cane)	Up to 3.0 kg	12-15 years
Small Khushi	0.25 kg	7-8 years
Large Khushi	3.0-3.5 kg	3-4 years
Cylindrical Khushi	Up to 2.0 kg	5-6 years
Dukik	Up to 15.0 kg	10-15 years
Chata	-	Approximately 1 year

Overview of Tool Use in Post-Harvest Operations

Field observations confirmed that women perform most post-harvest tasks, including threshing, cleaning, winnowing, measuring, and storage of grains (Figure 8). Traditional tools remain central to these activities due to their availability, affordability, and cultural relevance.

Table 3. Functional Classification and Gender-wise Use of Traditional Tools

Functional Category	Tool(s)	Predominant User
Threshing and drying	Darai Bari, Nawra	Men and women
Sieving	Chalaing, Changla	Women
Winnowing	Kula	Women
Measuring	Don, Tala	Women
Utility baskets	Khushi	Women
Storage	Dukik	Women
De-husking and grinding	Uron, Gaina	Women
Cleaning	Jharu, Chata	Women

DISCUSSION

The findings reveal that traditional tools continue to play a vital role in the agricultural and domestic activities of the Koch community. Similar observations have been reported among other tribal communities where indigenous tools remain widely used despite increasing mechanization.

The extensive use of bamboo, wood, and cane reflects the community's sustainable utilization of locally available resources. These materials are renewable, inexpensive, and easily shaped into functional tools.

Women were identified as the primary users of most post-harvest tools, highlighting their substantial contribution to household food processing and storage. However, repetitive manual tasks performed using tools with non-optimized dimensions and handles may increase the risk of musculoskeletal disorders.

The present documentation provides baseline information that can be used to redesign selected tools using ergonomic principles while preserving their cultural authenticity and practical utility.

Further, studies may be conducted incorporating ergonomic and biomechanical assessments using standardized occupational health evaluation tools to quantify the physical strain associated with prolonged use of traditional implements. Comparative evaluation between indigenous tools and modern mechanized alternatives may also help identify differences in efficiency, safety, drudgery, and productivity. In addition, qualitative investigations may be carried out focusing on women users could provide deeper understanding of lived experiences, cultural

CONCLUSION

The Koch community of South West Garo Hills District, Meghalaya, continues to depend mainly on traditional tools and implements for post-harvest and household activities. These implements, fabricated primarily from bamboo, wood, and cane, are economical, functional, and deeply embedded in the cultural practices of the community.

Women play a dominant role in the use of these tools during threshing, winnowing, de-husking, and storage operations. Although these tools are well adapted to local conditions, their design often lacks ergonomic considerations, which may contribute to physical strain and musculoskeletal discomfort.

Documenting indigenous tools is essential for preserving traditional knowledge and for guiding future interventions aimed at improving tool design. Ergonomic modification of these implements can help reduce drudgery, enhance productivity, and improve the health and well-being of rural women engaged in agriculture. Further research integrating ergonomic evaluation, occupational health assessment, and user-centered qualitative approaches would help develop culturally appropriate and ergonomically improved interventions for rural women engaged in agriculture.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Author Contributions

- **Ranima Saikia:** Conceptualization, data collection, documentation, data analysis, and manuscript preparation.
- **Cardeance M. Marak:** Data collection and field coordination.
- **Salnamchi J. Sangma:** Data collection and field coordination.

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Figure Captions

Figure 1. (a) Darai Bari; (b) Nawra.

Figure 2. (a) Chalaing; (b) Changla; (c) Kula.

Figure 3. (a) Don; (b) Tala; (c) Large Don.

Figure 4. (a) Small Khushi; (b) Large Khushi; (c) Cylindrical Khushi.

Figure 5. Dukik.

Figure 6. (a) Uron; (b) Gaina.

Figure 7. (a) Plant-branch Jharu; (b) Bamboo-stick Jharu; (c) Chata.

Figure 8. Traditional tools used in post-harvest operations by Koch women.

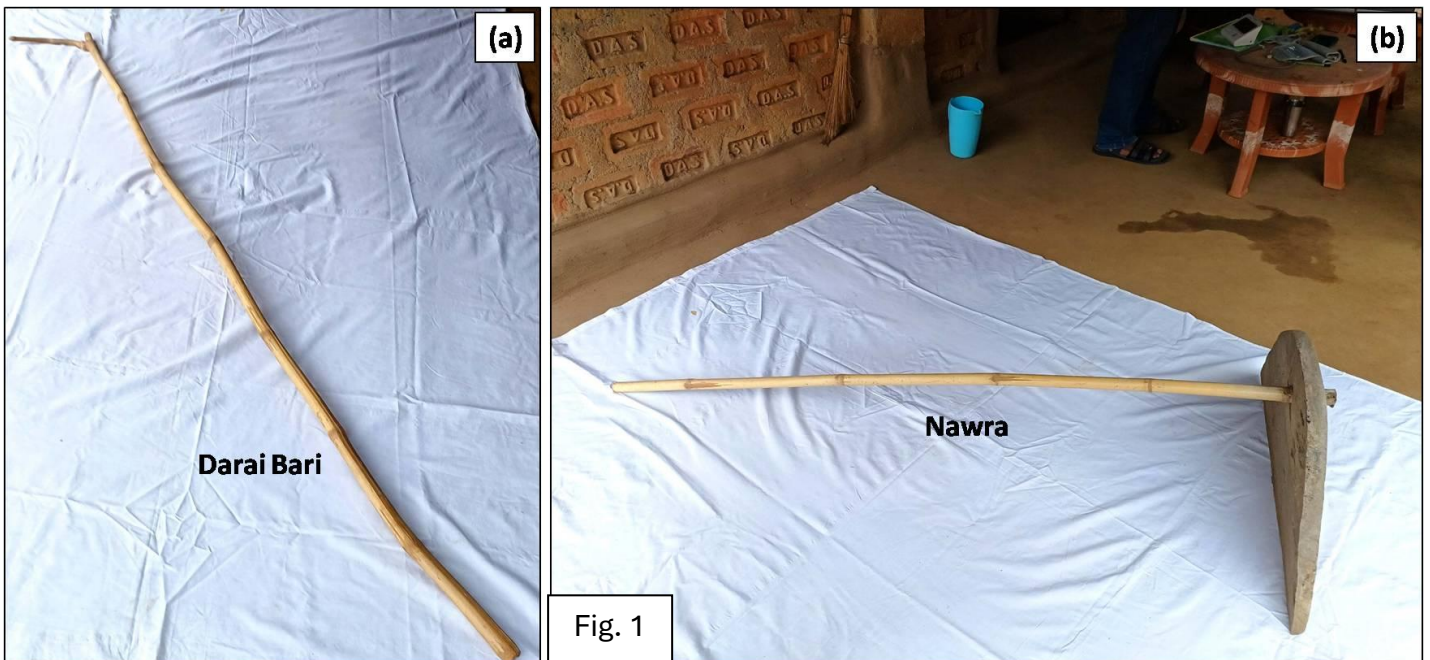


Fig. 1

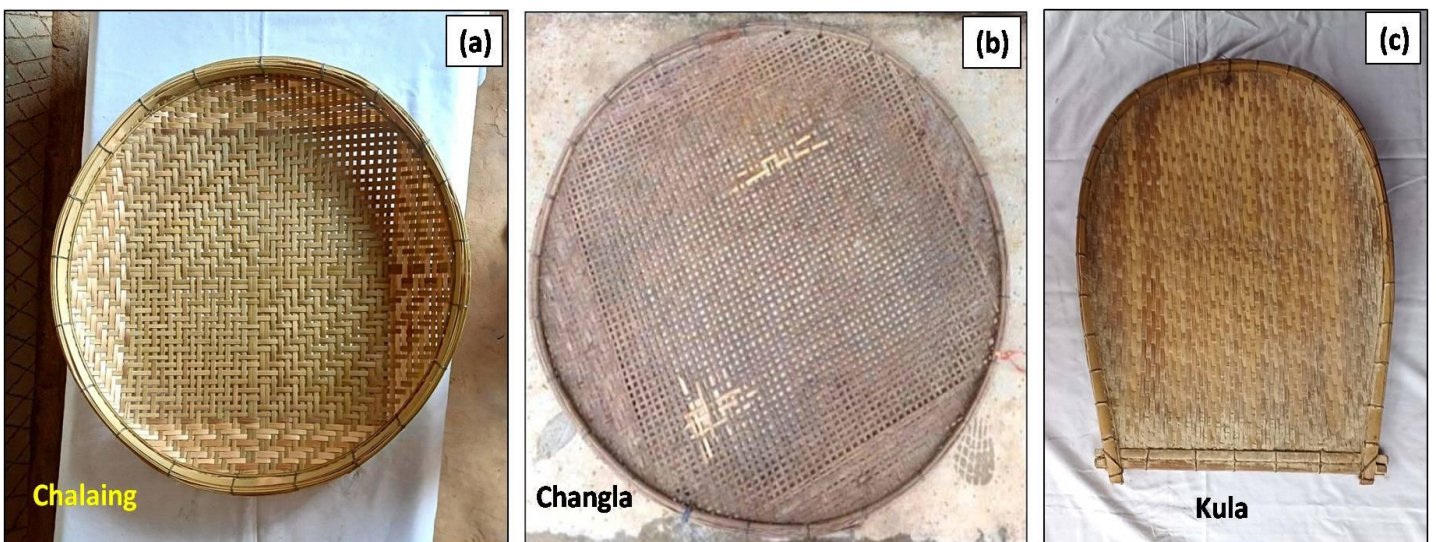


Fig. 2



Fig. 3



Fig. 4



Fig. 5 Fig. 6

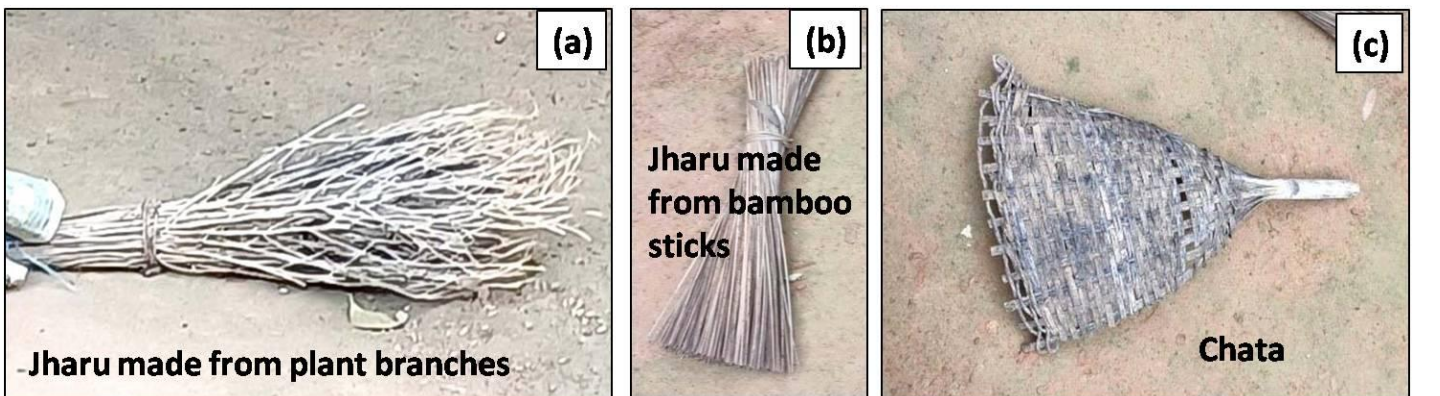


Fig. 7



Fig. 8