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Documentation of the traditional hand tools in selected tribal and non-tribal households of Assam

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The study aimed to document the various traditional hand tools and implements used in performing different agricultural activities in selected tribal and non-tribal households of Assam. Traditional hand tools and implements are easy to operate, cheap and used manually. A survey was conducted to gather information from the selected 100 households by 'Probability Proportionate to Size (PPS) technique' from two districts i.e., Jorhat and Karbi Anglong based on non-tribal and tribal (hill tribe) households population. Data were gathered by observation and interview method conducted with purposively selected informants. The study revealed that farmers of Assam still use traditional tools and implements. The detailed information about each tool was collected and informative notes were taken. A total of 22 tools documented during this study are presented in this paper.

Keywords: Agricultural activities, Non-tribal, Traditional hand tools, Traditional tools and implements, Tribal

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A majority of workforce in the world is involved in agricultural activities. Indian agriculture could be a critical economic field. Food accounts for nearly half of an average Indian's total spending, while agriculture employs approximately half of the country's workforce to ensure its long-term sustainability. While most other states in India are gradually moving away from their traditional agriculture-based economy toward industry or service oriented economy, Assam is a state in Northeast India, still heavily dependent on the agricultural sector. The north-eastern region (NER) of India is distinct from the rest of the country due to the large number of tribal and other indigenous groups with distinct ethnic, linguistic, religious and historical identities[1]. Further, economy of this region is dominantly agrarian where more than 70% of the workers earn their livelihood from agricultural activities. Generally, Jhum (shifting) cultivation in the hilly areas and settled agriculture in the plains is practised by farmers in the north-eastern region (NER). About 75% of the state's population is directly or indirectly dependent on agriculture, while about 69% of the workforce in the state is actually engaged in agricultural activities[2]. Agriculture is considered as the mainstay of the economy of Assam and plays a vital role in the State's economy. Agriculture and allied activities in Assam have overriding importance as source of livelihood to its people. The agriculture sector in India specifically Assam utilizes manual power. In traditional agriculture, hand tools play an important role. Farm workers in Assam utilized hand and animal-drawn equipments to carry out their agricultural practises. Land clearing and planning, ploughing, sowing, weeding, irrigation, harvesting, post-harvesting operations and transportation are all examples of agricultural operations where tools and implements are used in conjunction with specific functions[3]. They are used in various agricultural operations right from the cutting of bushes to land preparation to post harvest management. The use of appropriate agricultural equipment and hand tools for agricultural field operation contributes to the viability of the farm by enhancing production efficiency. Hand tools are necessary for plant propagation, soil preparation, planting, pest and weed control, irrigation, harvesting, postharvest handling, grain storage and distribution.

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Farmers have traditionally used a wide variety of techniques in their day-to-day agricultural operations[4,5]. Hand implements have been used since the Stone Age; stones were utilized for hammering and cutting. During the Bronze Age implements were made by casting the copper and tin alloys. Implements were sharper and harder in bronze than those composed of stone. During the Iron Age, iron superseded bronze and implements became even more vigorous and more durable[6] and utilized for a long time, until recently or still being used now to increment agricultural engenderment[7]. Despite rapid farm mechanisation (e.g., 149 million farm machinery), the overwhelming majority of resource-poor farming families relies on traditional methods are clear indications[8] (e.g., 520 million hand tools and 37 million animal-drawn implements are in operations). Traditional tools and implements dominated over the modern equipments as they are locally developed[9] and cost of manufacturing is less. A total of 32 hand tools and equipments such as *khurpa, kodal, kural,chalni, kaste, daw, silnora, kula, jhuri, nanda* and *paniki* were documented in every household of selected districts of West Bengal[10]. Participatory rural assessment (PRA) described and recorded twenty-one conventional agricultural tools, such as observation and discussion[4]. Further, it was reported that traditional tools and implements are considered prosperous because these implements are economical, feasible and sustainable. It can spread expeditiously and easily from one region to another. Traditional hand tools are extremely valuable and can be used as a foundation for modern tools. The lost knowledge must be gathered and applied to the new design of equipment and implements. If required then design modification can be done by the application of ergonomics. So far, there is no report of an investigation conducted in Assam to document the traditional tools and implements used in agricultural practises. Therefore, the purpose of this study was to document the traditional tools and implements used by the tribal and non-tribal households of Assam.

Methodology

For this present study, multi stage-cum simple random sampling was adopted for selecting the representative sample in order to fulfill the objective of the investigation. Jorhat and Karbi Anglong districts were purposively selected based on tribal (hill tribe) and non-tribal households population for this study. Jorhat sub division and Diphu sub- division were selected using simple random sampling from Jorhat district and Karbi Anglong district of Assam. From Jorhat sub-division, Bachchung Development block and from Diphu subdivision, Lumbajong development block were selected randomly. Two villages from eack block were selected randomly and the households were selected by following Probability Proportionate to Size (PPS) technique, 50 from each district. The data were collected through personal interviews and observation with an interview schedule.

Results and Discussion

Traditional farm implements and implements for self-subsistence have been developed and modified through experience over generations to meet emerging socio-economic and farming challenges. Traditional agricultural tools and implements are composed of locally available materials viz., stone, wood and iron, constructed at local level or standardized factory-made implements. These equipments and implements were economical in terms of labour, money and time preserving[7]. Almost all farming communities have common traditional agricultural implements in various tribal and non-tribal dominated villages[7,11]. In the present study, effort was made to document the available farm tools and implements. A brief discussion of the most commonly used indigenous agricultural tools by the tribal and non-tribal farmers are documented, which includes English name or local name, description and usages. (Table 1)

Axe (*Rowa/Kuthar*)

It has many specialized uses. It is used for clearing fields, cutting shrubs and chopping wood. It is also commonly used to cut bamboo and tree branches for firewood.

Hoe (*Khudrang/Kur*)

It is mostly used for digging and moving soil. This tool is commonly used in shaping soil, removing weeds, harvesting root crops etc. Weeding with a hoe entails agitating the soil surface or cutting leaves from roots, as well as removing old roots and crop residues from the soil.

Machete (*Sishong/Dao*)

It is a multipurpose cutting tool used for cutting bamboo and making strip, wood, clearing brush in the area, and so on. Machetes are often used for routinely cutting foliage and removing small formed plants and

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam.

Name of the tool	Tribal		Non-tribal	
Axe	Local name: *Rowa* Dimensions: Handle: Length: 60-80 cm Material: Bamboo (Bambusoideae) Working edge: Size: 3 inch Material: Shaft iron		Local name: *Kuthar* Dimensions: Handle: Length: 60-80 cm Material: Bamboo (Bambusoideae) Working edge: Size: 3 inch Material: Shaft iron	
Hoe	Local name: *Khudrang* Dimensions: Handle: Length: 65-100 cm Material: Bamboo (Bambusoideae) Working edge: Length 22 cm and breadth 18 cm Material: Iron		Local name: *Kur* Dimensions: Handle: Length: 80- 100 cm Material: Bamboo (Bambusoideae) Working edge: Length 22 cm and breadth 18 cm Material: Iron	
Machete	Local name: *Sishong* Dimensions: Handle: Length:15-30 cm Material: Bamboo (Bambusoideae) Working edge: Blade length: 18-30 cm Material: Steel/ iron		Local name: *Dao* Dimensions: Handle: Length: 15-30 cm Material: Bamboo (Bambusoideae) Working edge: Blade length: 18-30 cm Material: Steel/ iron	
Spade	Local name: *Belsa* Dimension: Handle Length: 20-24 inch Material: Steel/ iron Working area: Length of 9 inch and breadth of 5-7 inch Material: Steel/iron		Local name: *Belsa* Dimension: Handle Length: 24-28 inch Material: Steel/ iron Working area: Length of 9 inch and breadth of 5-7 inch Material: Steel/iron	

(*Contd.*)

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam. (*Contd.*)

Name of the tool	Tribal		Non-tribal	
Rake	Local name: *Rake* Dimension: Handle: Length: 80-100 cm Material: Bamboo (Bambusoideae) Working edge: Tooth size: 3-6 inches Material: Mild steel/ iron		Local name: *Joboka* Dimension: Handle: Length: 100-150 cm Material: Bamboo (Bambusoideae) Working edge: Tooth size: 3-6 inches Material: Mild steel/ iron	
Grass cutter machete	Local name: *Sishong* Dimension: Handle Length: 15-18 cm Material: Bamboo (Bambusoideae) Blade Length: 40-45 cm Material: Steel		Local name: *Pomuwa da* Dimension: Handle Length: 10-15 cm Material: iron Blade Length: 40-45 cm Material: Steel	
Trowel	Local name: *Khurpi* Dimension: Handle : Length: 3-5 inch Material: Teak (*Tectona grandis*)/ Bamboo (Bambusoideae) Working area: Length of 5-7 inch and breadth of 3 inch.		Local name: *Khurpi* Dimension: Handle: Length: 3-5inch Material: Teak (*Tectona grandis*)/ Bamboo (Bambusoideae) Working area: Length of 5-7 inch and breadth of 2-4 inch.	
Shovel	Local name: *Belsa* Dimension: Handle: Length: 50-60 cm Material: Steel/iron Working area Material: Steel/ shaft iron		Local name: *Belsa* Dimension : Handle: Length: 50-60 cm Material: Steel/iron Working area Material: Steel/ shaft iron.	

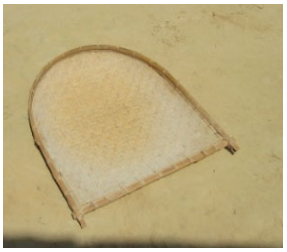
(*Contd.*)

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam. (*Contd*.)

Name of the tool	Tribal		Non-tribal	
Crow bar	Local name: *Khorjing* Dimension: Length: 60-80 cm Material: Iron		Local name: *Ciprang* Dimension: Handle: Material: Bamboo (Bambusoideae) Length: 50-60 cm Working area: Material: Steel/iron	
Small hand hoe	Local name: *Kur* Dimension: Handle: Length: 30-40 cm Material: Bamboo (Bambusoideae) Working area: Length: 10-15 cm Material: Shaft iron.		Local name: *Kur* Dimension : Handle: Length:30-40 cm Material: Bamboo (Bambusoideae) Working area: Length: 10-15 cm Material: shaft iron.	
Knife	Local name: *Chaku* Dimension : Handle: Length: 10-12 cm Material: Bamboo (Bambusoideae) Working area: Blade length: 15-18 cm Material: steel/ shaft iron		Local name: *Kotari* Dimension : Handle: Length: 8-10 cm Material: plastic Working area: Blade length: 15-18 cm Material: steel/ shaft iron	
Digging stick	Local name: *Goda* Dimension: Length: 100 cm Material: Bamboo (Bambusoideae)			

(*Contd*.)

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam. (*Contd.*)

Name of the tool	Tribal	Non-tribal
Sickle	Local name: *Sungi* Dimension: Handle Length: 10-15 cm Material: Bamboo (Bambusoideae) Working area: Blade material: Mild steel/ shaft iron. 	Local name: *Kasi* Dimension: Handle Length: 10-15 cm Material: Bamboo (Bambusoideae) Working area: Blade material: Mild steel/ shaft iron 
Bamboo sieve	Local name: *Sangkhon* Dimension : Diameter:60-80 cm Material: Bamboo (Bambusoideae) 	Local name: *Dola* Dimension : Diameter:60-80 cm Material: Bamboo (Bambusoideae) 
Winnower	Local name: *Maijai* Dimension: Length: 40-50 cm Breadth: 30-40 cm Material: Bamboo (Bambusoideae) 	Local name: *Kula* Dimension: Length: 40-50 cm Breadth: 30-40 cm Material: Bamboo (Bambusoideae) 
Bamboo basket:	Local name: *Khamphlu* Dimension: Diameter: 30-40 cm Material: Bamboo (Bambusoideae) 	Local name: *Paasi* Dimension: Diameter: 30-40 cm Material: Bamboo (Bambusoideae) 

(*Contd.*)

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam. (*Contd*.)

Name of the tool	Tribal		Non-tribal	
Small Sieve:	Local name: *Maijai* Dimension: Diameter: 40-50 cm Material: Bamboo (Bambusoideae)		Local name: *Saloni* Dimension: Diameter: 50-75 cm Material: Bamboo (Bambusoideae)	
Pounding tool	Local name: *Samtho rimin* Dimension Pestle: Length: 4-5 ft Material: Teak (*Tectona grandis*) Mortar: Height: 2-3 ft Depth: 1-1.5 ft Diameter: 30-40 cm Material: Teak (*Tectona grandis*)		Local name: *Dheki* Dimension : Foot paddle: Length: 8-10ft Material: Teak (*Tectona grandis*) Mortar: Depth: 5-6 inch Material: Teak (*Tectona grandis*)	
Grain separator	Local name: *Khongkhai* Dimension: Length: 80-120 cm Material: Bamboo (Bambusoideae)		Local name: *Ukhon* Dimension : Length: 80-120 cm Material: Bamboo (Bambusoideae)	
Paddy spreader	Local name: *Roina* Dimension: Handle Length: 80-100 cm Material: Bamboo (Bambusoideae) Working area Material: Teak (*Tectona grandis*)		Local name: *Kurhuna* Dimension: Handle Length: 80-100 cm Material: Bamboo (Bambusoideae) Working area Material: Teak (*Tectona grandis*)	

(*Contd*.)

Table 1 — Documentation of the available hand tools in selected tribal and non tribal households of Assam. (*Contd*.)

Name of the tool	Tribal	Non-tribal
Bamboo stick	Local name: *Biriya* Dimension: Length: 100 cm Material: Bamboo (Bambusoideae)	Local name: *Biriya* Dimension: Length: 100-120 cm Material: Bamboo (Bambusoideae)
		

branches from fields. Farmers use it for a variety of purposes in the paddy field, and people rely on it for many of their daily tasks.

Spade (*Belsa*)

It is used to break up lumps in the soil or dig or loosen the earth. It has a long handle and a blade that is usually thinner and less curved than a shovel.

Rake *(Joboka)*

It is used to gather leaves, hay, grass and other materials, as well as loosening the soil, moderate weeding and levelling, cutting dead grass and other agricultural tasks. This tool is often used to remove trash from seedbeds and to break capillary action in soil after rain to preserve moisture, allowing a farmer to perform tillage and sowing operations over a longer period of time.

Grass cutter machete *(Sishong/Pomuwa da)*

It is used for cutting of grass and clearing field. It has a small handle with long blade. This tool is available in most of the tribal households.

Trowel *(Khurpi)*

It is a small hand tool that is used to dig, add, smooth, or move small quantities of viscous or particulate material. It's also used to break up soil, dig small holes, particularly for planting and weeding, and mix in fertiliser or other additives.

Shovel *(Belsa)*

It is a tool for digging, lifting, and moving bulk materials, such as soil, gravel, stones, sand, etc. It is very useful in agriculture. Also it is used to remove weeds, shrubs and planting trees.

Crow bar *(Khorjing/Ciprang)*

This is a solid rod with flatten end used for making holes using which plants can be transplanted. It is the simplest tool used in agriculture for digging activity.

Small hand hoe *(Kur)*

It performs weeding operation. This is generally used for removing weeds.

Knife *(Chaku/Kotari)*

A knife is a lightweight, handy cutting tool. It is used in harvesting operations and both male and female operators run it.

Digging stick *(Goda)*

The digging stick is one of the most basic tools for agricultural purposes. The digging stick is pointed at the end to aid in the creation of holes in the soil into which seeds can be dropped. It comes in handy when it comes to planting or spreading seeds in the field. Both males and females use it.

Sickle *(Sungi/Kasi)*

The sickle is a "C" shaped/curved hand-held agricultural tool designed with a view to ease the harvesting operation and typically is used to harvest crops. It is most commonly used hand tool for weeding to remove weeds which are left within the crop rows. The tool is used in squatting position. The shape and design of the sickle are region or location specific depending upon the soil and cultural practices.

Bamboo sieve *(Sangkhon/Dola)*

It is used to separate dust, stones and other foreign matters from cereals. It is often used to separate various types of grains from threshed products, and it is mainly used by women.

Winnower *(Maijai/Kula)*

Winnowing means either fanning the winnower over the mixture so that the wind blows away the lighter husk while the heavier grains fall back down for recovery or throwing the mixture into the air with the aid of a winnower so that the lighter husk is blown away while the heavier grains fall back down for recovery. It's made of bamboo sticks that have been knotted together.

Bamboo basket *(Khamplu/Paasi)*

It's made out of bamboo sticks that have been knotted together. It is used to carry and store cereal grains, pulses and other foods. It is operated by both male and female employees.

Small Sieve *(Maijai/Saloni)*

It's a bamboo-woven plate or panel with a bamboo-woven border area that is connected to the working area with raiding (wild leaf used for tying). It is mostly used by females to separate various types of grains from threshed materials.

Pounding tool *(Samtho rimin/Dheki)*

It is used for removal of husk from paddy, milling, etc. And it is generally operated by women workers. The pounding tool consists of pestle and mortar.

Grain separator *(Khongkhai/Ukhon)*

It is made of bamboo and used during the post-harvesting process. Wheat and other grains are threshed with oxen after drying and the farmer separate the grain and straw with this grain separator. It is operated by both male and female workers.

Paddy spreader *(Roina/Kurhuna)*

It is made of wood and bamboo. It is used while sun drying of paddy. Before milling of paddy sun drying is done, while doing this activity paddy spreader is used. This activity is mostly done by women.

Bamboo stick *(Biriya)*

It is used for carrying harvested crops to the threshing area.

Conclusions

Agriculture in North East India is not technically developed, still utilizes manual power with indigenous hand tools. Very few farmers of this region are aware of the mechanized agricultural equipment. Mechanized agricultural tools and implements increases the work efficiency and production thereby reducing health related problems. In the surveyed areas, both tribal and non-tribal farmers were found to use indigenous tools and implements in the field as they consider these tools as local made, cheaper, affordable and are easily available in the market. From the study, it can be concluded that all selected households have its own collection of agricultural implements and do not depend upon others. According to several studies, almost all farming communities in India have common traditional agricultural implements such as the Sickle (*Kaste*), Plough (*Bakhar*), Spade (*Kodal*), Trowel (*Khurpa*), Bamboo sieve (*Chhalna*), Axe (*Kural*), etc. Though these traditional tools have their own worth, very handy and useful but sometimes users may find difficulty while using for longer period of time. Due to which users are opting for modern tools than traditional tools. So to make it comfortable for the users and also to preserve these traditional tools, some modification using ergonomic principles is much needed.

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Conflict of Interest

The authors declare that there is no conflict of interest for this study.

Authors' Contributions

SL: Collection of data, documentation, compilation and writing of manuscript. NB & MK: Compilation of manuscript. PK: Contributed in data collection.

References

1 Sengupta S, People of North East India, Gyan Publishing House, New Delhi, India, (1996).

2 Ninan K N, Economics of shifting cultivation in India, *Econ Polit Wkly,* 27(13) (1992) A2-A6.

3 Brahma N & Daimary L, Traditional agricultural tools and technology used by the Bodos, IOSR *J Humanit Soc Sci*, (IOSR-JHSS), 22(5) (2017) 65-72.

4 Karthikeyan C, Veeraragavathatham D, Karpagam D & Firdouse S A, Traditional tools in agricultural practices, *Indian J Tradit Know,* 8 (2) (2009) 212-217.

5 Sundaramari M, Ganesh S, Kannan G S, Seethalakshmi M & Gopalsamy K, Indigenous grain storage structures of South Tamil Nadu, *Indian J Tradit Know,* 10 (2) (2011) 380-383.

6 Cacha A & Charles, Ergonomics and afety in and ool Design, CRC. ISBN 1566703085, (1999).

7 Elzubeir A S, Traditional agricultural tools and implements used in Sudan, *Int J Agric Sci,* 4 (2) (2014) 140-146.

8 Nag P K & Nag A, Drudgery, accidents and injuries in Indian agriculture, *Indian Health,* 42 (2) (2004) 149-62.

9 Singh L K, Devi S R & Singh M H, Traditional agricultural tools and implements used in Wokha, Nagaland, *Indian J Hill Agric,* 28 (1) (2015) 50-55.

10 Sarkar B, Sundaram P K, Dey A, Kumar U, Sarma K, *et al*., Traditional Agricultural Tools used by Tribal Farmers in Eastern India, *Res J Agric Sci*, 6 (1) (2015) 215-219,www.rjas.info DI: 2106-1209-2014-054.

11 Das P K & Nag D, Traditional agricultural tools: A review *Indian J Tradit Know*, 5 (1) (2006) 41-46.