



## Problems Faced by the Farm Workers While Using Different Agricultural Hand Tools and Implements

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The agriculture sector in India specifically Assam utilizes manual power. In traditional agriculture, hand tools play an important. Man rarely works without the help of tools, machines or devices. And also machine cannot continue working for very long without some human intervention. Here, Both the 'man' and 'machine' are used in broader sense: 'man' includes woman, and the 'machine' is any physical equipment, hand tools, device, facility or thing people use in carrying out any activity. In agricultural activities, hand tools play an important role. It assists the farmers to work in the field with ease. Farmers use their hand and fingers to use hand tools. It is a manual work. It is difficult and laborious work. This requires diverse and sometimes extreme levels of exertion, depending on the action, movement or manipulation involved. Tools vary in sizes and dimension depending up on geographical location, which sometimes instead of helping the worker with ease it gives negative impact in their health.

In Assam farmers still use simple tools and implements that are easily available for various farm operations. These tools are either obtained from the market or made with help of local artisans such as carpenters and blacksmiths. Injuries and symptoms such as pain, numbness, and tingling, as well as reduced worker productivity, lost time from work, temporary or sometimes lead to permanent disability are seen quite common among the users of these indigenous hand tools (Aghazadeh and Mital 1987, Chao *et al.* 2000). A hand tool is a tool which is used manually. Hand tools have been used since the Stone Age; stones were used for hammering and cutting. During the Bronze Age, hand tools were made by casting the copper and tin alloys. Tools were

sharper and harder in bronze than those made of stone. Iron replaced bronze during the Iron Age, and tools became even stronger and more durable. Ever since humans started to build hand tools, there was interaction between the humans and the machines. The interaction between man and machines evolved over time. Transition of tools from being craftsman made to factory made started to produce after the industrial revolution. This industrialization brought widespread use of tools and machines to the workplace & these have steadily grown in number and complexity since that time.

Hand tools have been in use for a very long time and have developed in an almost evolutionary manner. There was no drastic change in the development of agricultural tools till the turn of twentieth century. These hand tools are required to increase productivity and to facilitate workers. Traditional agricultural tools and implements are made up of locally available materials like stone, wood and iron, constructed at local level or standardized factory-made implements. These tools and implements are economical in terms of labour, money and time saving. Traditional hand tools are easy to operate and it is cheap. Almost all farming communities have common traditional agricultural implements like Sickle, Plough, Spade, Winnowing, *Khurpa*, Bamboo sieve, Weeder, Axe, etc., developed by blacksmiths. Each of these tools and implements are usually used in connection with specific operation in the sequence of agricultural operations; land preparation, sowing, weeding, irrigation, harvesting, post-harvest operations and transportation (Karthikeyan *et al.* 2009). Indigenous Tools and implements are considered successful as they are

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economical, feasible and sustainable. It can spread quickly and easily from one region to another (Das and Nag 2006, Elzubeir 2014).

Though the tools and implements are made to assist in work performance but in reality sometimes it creates problems among the users; may be due to improper design features. Considering ergonomics principles in designing hand tools makes possible to produce tools/implements that blend smoothly with a persons' body or action. Ergonomic establishes user friendliness, compatibility between man and his surroundings and articles for his use. There is growing demand among hand tools users to have ergonomically designed product (Schmudtke 1984, Snow 1984), but there is very little history of application of ergonomic approaches in agricultural equipment design (Vyavahare et al. 2012). These tools sometimes may lower the efficiency of the users and increase tiredness which may lead to work related problems.

Personal interview cum observation method was used to collect the data. For the study an interview schedule was used. Survey was conducted to gather information from the selected 120 households by following Probability Proportionate to Size (PPS) technique from two districts i.e. Jorhat and Karbi Anglong. The data were collected from the respondents by the investigator personally.

Work related health hazards attributed to work includes a group of conditions that involve the different body parts. Often it is intensified by the work environment. Problems

faced by the farmers while performing different field activities by using different hand tools was studied.

#### *Machete*

Machetes need force in using. The shoulder pain, wrist pain, neck pain develops after using for longer period. Due to the hard handle surface, blisters develop. Machete slippage cuts on fingers, hand or knee by hitting hard surface are common problems among the respondents. Also using lower and upper back pain occurs when the tool is used in an awkward posture.

#### *Hoe*

This is the most common farm tool after machete. It is constantly used to move soil, to cultivate etc. Many hoes available in rural areas are not ergonomically designed. It requires wrist bending, body bending, awkward posture, etc. These factors may cause unexpected injuries like carpal tunnel syndrome, musculoskeletal disorder and lower back injuries.

#### *Plough*

This is a seasonal activity. It is mostly used in times of land preparation. In using animal-drawn equipment, the worker acts as a controller of animals and guides the implement with a handle. It involves considerable human energy expenditure. Body pain in different parts is the common problem.

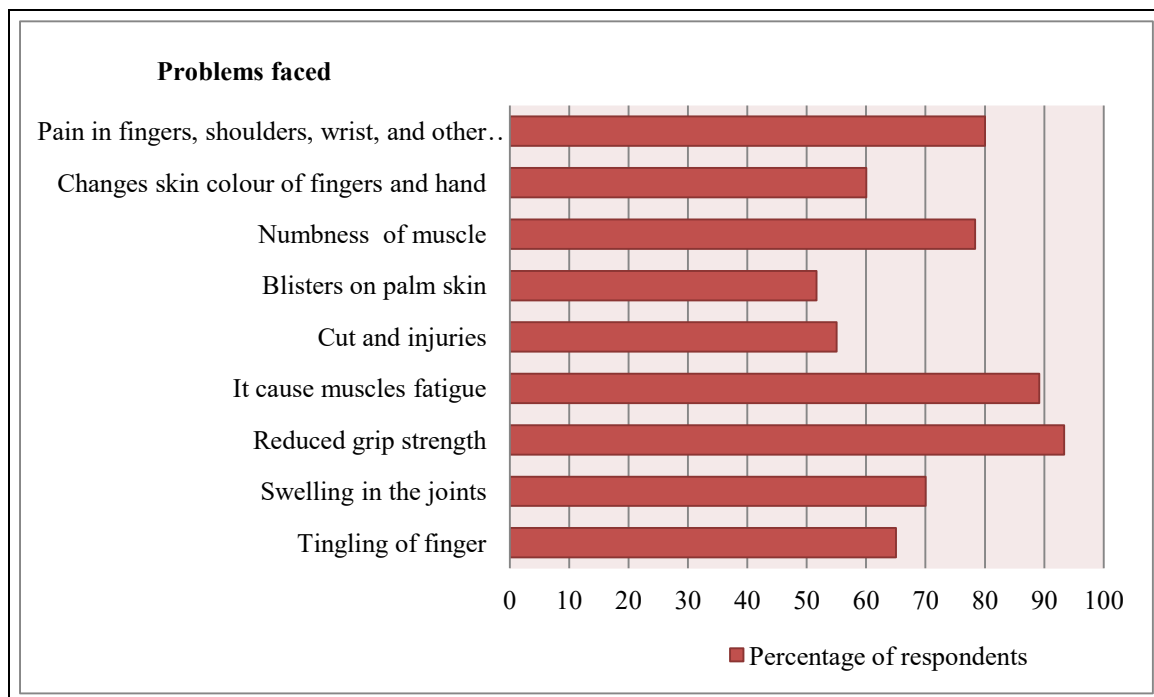


Fig 1 Problems faced by farmers while using different hand tools

#### *Sickle*

In using sickle, farmers have to in a bending position. However, the bend position during longer periods lead to a tensing of certain muscles and thus result in quicker

tiredness and soreness in the lower back and necks of the farmers.

#### *Knife*

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Knife is a multipurpose tool. It is used in kitchen as well as in agricultural field. From the survey it was revealed that respondents faced problems in using this tool. Injuries usually happen when the knife slips during cutting or trimming. In most cases blade comes into contact with the worker's other hand, causing a laceration to the other hand or / finger. Fatigue in finger develops.

### Trowel

Trowel is used frequently in both tribal and non tribal areas. While using trowel, farmers need to be in sitting position and arm stretching to dig shrubs, weed and grasses. Due to which pain in knee, arm, and lower back and in other body parts developed.

### Bamboo sieve

Bamboo sieve is available in every household and it can be said to be used regularly. In using bamboo sieve, worker needs to be in sitting position with arm stretching forward and body bending. Pain in lower back, hand, knee, and in arms developed after using this sieve for longer period of time.

### Rake

Many problems worker faced while using this tool. Blister and hand injury is most common among the respondents. The risk of strain in a back, shoulders and neck increases when handle is too short or tool is too heavy. Twisting at the waist while performing leads to shoulder and other body part pain.

Further analysis of data revealed that respondents raised complaints when they were asked to tell about their health

issues and the responses were found quite similar to the findings of Kuijt-Evers *et al.* (2004). From the data it was found that highest percent (93.33) of respondents complained of reduced in grip strength which was followed by Pain in fingers, shoulders, wrist, and other body parts (80 percent) and numbness of hand muscles (78.33 percent).

## SUMMARY

The present study was carried out to know the problems faced by the farmers while using hand tools and implements in performing different agricultural activities. For the study exploratory research design was used. Survey was conducted to gather information from the selected households by following Probability Proportionate to Size (PPS) technique from two districts i.e., Jorhat and Karbi Anglong. In agricultural activities, farmers get injured using traditional tools. The most injury was in hand. Using agricultural tools farmers feel fatigue/discomfort in different levels of their body part. From the data it was found that highest percent (93-33) of respondents complained of reduced in grip strength which was followed by Pain in fingers, shoulders, wrist, and other body parts (80 percent) and numbness of hand muscles (78.33 percent). Findings revealed that farmers of Assam use traditional tools and implements since long time and most of the farmers felt immense drudgery in their use. It was also found that most of the farmers were unaware of improved drudgery reduction hand tools and implements. A design modification by applying design principles of hand tools is deemed necessary to improve working conditions and decrease the level of exposure to work related problems.

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