

Traditional tools in agricultural practices

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The study was undertaken to identify various traditional tools used for agricultural operations by the farmers of Tamil Nadu. Agricultural tools are as old as Stone Age. Traditional agricultural tools were economical in terms of labour, money and time saving. These tools were made up of locally available materials like stones, wood, etc. Traditional tools are operated easily without any special skills. The study was conducted in Coimbatore, Erode, Salem, Krishnagiri, Villupuram, Dindigal, Madurai, Kovilpatty, Aruppukottai and Virudhunagar districts of Tamil Nadu. Information was documented by using Participatory Rural Appraisal (PRA) techniques like observation and discussion. In the study, 21 traditional agricultural tools were identified and described.

Keywords: Traditional tools, Indigenous tools, Agricultural practices, Tamil Nadu

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The mechanization of Indian agriculture is in its early stages. Human power still predominates, although it is often augmented by animal and/or mechanical power. Indigenous tools and weapons were basic but well designed to suit farmers needs. Traditionally farmers have been using a variety of tools and weapons in their everyday life, often for agricultural operations and household purpose. Prior to the recorded evidence of Bakhar, the Hindu epic *Ramayana* has mentioned the use of plough. A fresh development in new designs of implements and tools was noticed around independence. During this period, the traditional tools experienced improvement in design and metallurgy. A large number of traditional tools have appeared in a survey report¹. Most of the wooden tools, implements and weapons use local materials – different timbers for particular tools and strings for various uses come from different plants. Most of the implements and tools which were developed and is being produced by local artisans were made from stone, wood, bone, shell, teeth, plant fibre or animal. Farmers can quickly adapt it on the spot to change its purpose. While both men and women use some tools, there are tools that are used exclusively by women. New tools and equipments were developed with the discovery of the metals starting with copper, brass, bronze and finally iron; some of which have been developed in combination of hard cutting tool with wooden and

bamboo handle for ease and lightness. Many of the iron traditional tools have been modified and are being mass produced using modern techniques of production to affordable price and higher life. This abundant store of knowledge in the area of traditional hand tools, their craftsmanship, technique of production and metallurgy are still in practice and of great value. It is our duty to develop, preserve and protect them². Village artisans are the main source of supply, repair and maintenance of farm equipments. About 80% of the hand tools and traditional implements are made by village artisans. Materials used are mainly mild steel, scrap (files, blades, auto lead spring etc.) forged and hardened by quenching though the quality is lacking, the cost effectiveness is encouraging. The indigenous knowledge possessed by them is really worth and can be utilized as a base for modern gadgets. The forsaken wisdom has to be collected and utilized for modern designing of equipments and implements. If need be, with a slight modification, the locally made devices can be fabricated³. In this regard, the study was taken in selected villages in certain dry tracts of Tamil Nadu to document the indigenous tools and implements used by farmers.

Methodology

The study was conducted in the selected villages of the dry tracts of Tamil Nadu viz. Coimbatore, Erode, Salem, Krishnagiri, Villupuram, Dindigal, Madurai,

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Kovilpatti, Aruppukottai and Virudhunagar districts. In these locale, the villages were selected by appraisal of several indicators namely rainfall, overall agricultural development, cropping intensity besides consultation with ADA (Assistant Director of Agriculture), AO (Agricultural Officer) and AAO (Assistant Agricultural Officer) of the respective village. Participatory Rural Appraisal (PRA) methodology was adopted to identify and gather description about the indigenous tools that are prevalent in the selected villages. Key informants including progressive farmers belonging to small, marginal and big farmer categories, aged farmers, farmwomen and farm labourers were involved during the process of data collection. By contacting the respondents through one to one interaction and group discussion methods the indigenous tools used by dry land farmers and labourers were documented. Triangulation exercise was also done in the study villages to gather reliable information about indigenous tools.

Results and discussion

Indigenous tools used by the dry land farmers of Tamil Nadu were identified and described below:

Tool for ploughing

Country plough (*Kalappai*): Tillage is the basic operation in farming. It is done to create favourable conditions for seed placement and plant growth. This is done mainly with a bullock drawn plough made of *Acacia* wood. Usually, small farmers and farm owners of scattered lands are unable to use tractors and in that case country ploughs are highly preferred (Fig. 1). The basic components of the plough are a shoe, a share, a body, a handle and a beam. The handle is 0.6-1 m long, 5-7.5 cm thick and 7.5-12.5 cm wide and is fitted to the body of the plough. The shoe, used in the plough, can be of different shapes and sizes. The share is prepared from a mild steel bar, 0.6-7.5 m in length and 1.5-2.5 cm in width. The share is fixed to the shoe or body by means of a U-clamp or ring shaped clamp. The share point projects beyond the shoe by 5-7.5 cm. Beams generally vary in length from 2.4-3 m. It needs some skill in driving bullocks hence operated only by male labourers. Average life of the implement is 1 yr and costs Rs1000/unit. As country plough is a bullock drawn implement drudgery will be a burden on the animals.

Tools for intercultural operation

Weeder (*Aruguyetti*): The tool is used for removing deep-rooted weeds along with their rhizome

(Fig. 2). Weeds like *Arugampul* (*Hariyali* grass) and other grasses were easily removed with the help of this weeder and *mammuty*. The tool made up of iron has a handle (length 50 cm and 8 cm diameter) and working area i.e. comb like structure has a length of 25 cm and 30 cm diameter). The farm labourers first pierced the soil with the help of this weeder and lift the soil upwards. Another attendant should remove the uprooted weeds from the soil using other farm implements called *mammuty* (spade). About 2 acre/day could be covered by the tool. Other advantages like loosening of the soil, earthing up are achieved during weeding operation. Male labourers mostly operate it. Average life is 10 yrs and costs Rs120/unit.

Dry land weeder (*cycle gundu*): It is innovatively constructed with a front cycle wheel attached with *gorru* weeder blade at the back (Fig. 3). With the help of hand bar farmer's drive the weeder from the back and one attendant pull the hand bar joined with a thread from the front. It is used for removing weeds. The weeder blade has a length of 30 cm and width of 3 cm. It is operated by two men labours Average life is 5-6 yrs and costs Rs 400/unit.

Spade (*Mammuty*): It is used for formation of bunds, ridges and furrows and irrigation channels (Fig. 4). Handle is made up of *Acacia* sp wood and the working area is made up of iron. Handle is of 65 cm length and working area has a length of 22 cm and breadth of 18 cm. Mostly operated by male labourers, its average life is 5 yrs and costs Rs150/unit.

Harvesting tools

Sickle (*Karukkarival*): Used in harvesting most of the crops like cereals, pulses and millets. Sickle was designed 'C' shaped/curved with the view to ease the harvesting operation (Fig. 5). Hence it is preferred more than other tools and implements. With the help of sickle the ear heads, branches or even whole plant could be harvested. Working area is made up of iron and handle is made up of wood of *Acacia* sp. Working area has 20 cm length and 3 cm width. Handle is of 15 cm height and 5 cm width. Operated by both male and female worker, its average life is 5 yrs and costs Rs 25/unit.

Knife (*Kambar kathi*): It is very small and handy, made up of iron was used in harvesting the pulses crop like black gram (*Vigna mungo*), green gram (*Vigna radiata*), horse gram (*Macrotyloma uniflorum*), bengal gram (*Cicer arietinum*) and ear

heads of millets like sorghum (*Sorghum bicolor*), cumbu (*Pennisetum glaucum*), ragi (*Eleusine coracana*), etc (Fig. 6). Working area has a curved surface of 8 cm and handle has a length of 5 cm. Operated both by male and female labourers, its average life is 5 yrs and costs Rs 10/ unit.

Tamarind harvester (*Pulikokki*): It is used in harvesting fruits like tamarind (*Tamarindus indica*), lemon (*Citrus* sp), amla (*Phyllanthus emblica*), etc. It consists of a wooden handle made of bamboo and a hook curved made of iron (Fig. 7).. Using this harvester, farmer can avoid climbing tree to harvest fruits. With the long wooden handle, without any drudgery, farmers can harvest the fruits easily. Length of bamboo stick is 200 cm and the working area is an iron knife having a curved surface of 10 cm. Mostly it is operated by both male female labourers. Average life is 8 yrs and costs Rs 30 / unit.

Lemon harvesting tool (*Ezhumichai Karandi*): Used for harvesting lemon (*Citrus* sp) fruits and to collect the fallen fruits under the tree without thorn injury. The tool is made up of iron rod (Fig. 8). Lemon harvesting tool consists of 3 parts is top one is hook, middle handle and lower cup like structure. Handle is a long iron rod of 10 cm to which hook and cup like structure are attached at the top and bottom end, respectively. Hook is a curved 'C' shaped structure of 10 cm length attached to the hand at top most end facilitates harvesting of lemons from the trees. Cup like structure is of round in shape and has a diameter of 10 cm attached to the handle of the bottom end. Using hook, harvesting of fruits at greater height in the trees could be possible and cup like structure help in collecting fallen lemon fruit underneath the trees safe without any thorn injuries. Both men and women operate it; its average life is 10 yrs and costs Rs125 / unit.

Post harvest tools

Grain separator (*Kodun kol*): The tool is used before winnowing horse gram (*Macrotyloma uniflorum*). After drying, the plants are threshed with the help of tractors. After threshing, farmers with the help of *kodun kol* shake the plant materials forcibly so that the threshed materials and the grains are separated (Fig. 9). Then the grains were collected from the ground and cleaned manually. The tool consists of long handle made up of wood attached with a single or double iron rod. Handle has a length of 200 cm and iron rod of length 10 cm. It helps in separating the threshed materials and grains making

the winnowing operation easier. Also, farmers can handle this tool by standing straight without bending, thus reduces drudgery. It is operated by both male and female labourers. Its average life is 20 yrs and costs Rs 30/unit.

Wooden thresher (*Thattuppalagai*): It is used for threshing operation in crops like black gram (*Vigna mungo*), green gram (*Vigna radiata*), horse gram (*Macrotyloma uniflorum*), etc. The tool, made up of wood has a handle of length 28 cm and flat rectangular working board of 20 cm length and 12 cm breadth (Fig. 10). Wooden thresher eases the manual threshing operation. Both male and female labourers operate it. Average life is one yr and costs Rs15/unit.

Stone roller (*Uruttu Kal*): Stone roller is used in threshing of pulse crops like green gram (*Vigna radiata*), horse gram (*Macrotyloma uniflorum*) and black gram (*Vigna mungo*) and cereals and millets, etc. It is a circular roller of length 95 cm and diameter of 30 cm (Fig. 11). Threshing with stone roller is quicker and effective compared to manual threshing. Usually operated by male labour the average life is 20 yrs and costs Rs100/unit.

Bamboo winnower (*Muram*): It is used in cleaning and winnowing pulse grains (Fig. 12). Highly preferred for its shape and varied utilities in crops such as pulses, cereals, millets and oilseeds. It is made up of bamboo stick is coated with cow dung paste to fill up the holes/gaps. It is 'U' shaped and has a length, breadth and depth of 35 cm × 25 cm × 3 cm. Operated generally by household women, its average life is 2 yrs and costs Rs 20/unit.

Pulse siever (*Salladai*): The tool is used for separating the unsplit full grains from the splitted pulse grains (Fig. 13). Also removes stones and other wastes. It is made of iron. Working base area has 40 cm diameter and height 8 cm. The base has numerous rectangular grids of 0.3 mm diameter. Usually household women operate the tool leisurely. Its average life period is 10 yrs and costs about Rs 50/unit

Stone grinder (*Chekku*): The tool being both cheaper and effective in grinding makes it preferable in rural areas (Fig. 14). It is used for milling all kinds of cereals. Also used in crushing leaves during the preparation of leaf formulations and grinding rice (*Oryza sativa*), cotton seeds (*Gossypium* sp), etc., is made up of stone. It has a height of 140 cm and the diameter of working area is 15 cm. Usually operated



Fig.1 Country plough



Fig. 2 Aruguvetti



Fig. 3 Cycle gundu



Fig. 4 Mummutty

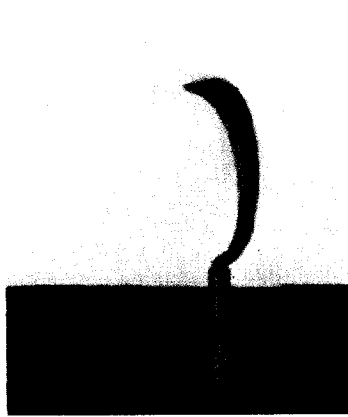


Fig. 5 Karukkarival



Fig. 6 Kambarkathi



Fig.7 Pulikokki

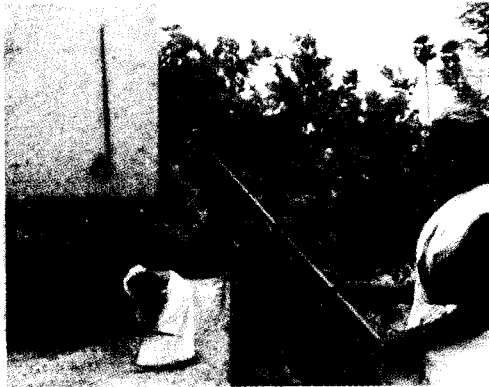


Fig.8 Ezhumichai Karandi

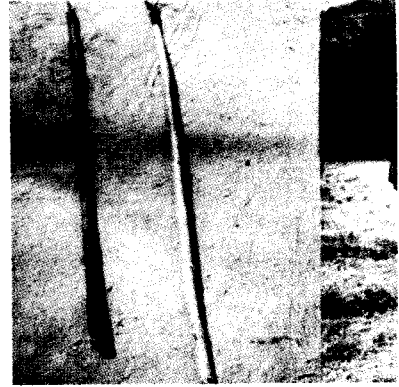


Fig.9 Kodunkol



Fig.10 Thattuppaligai

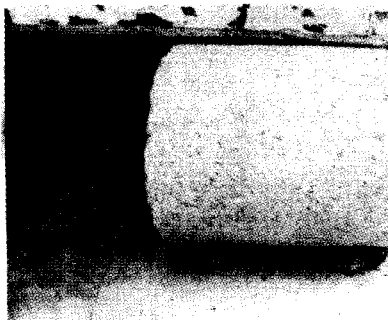


Fig.11 Uruttukal

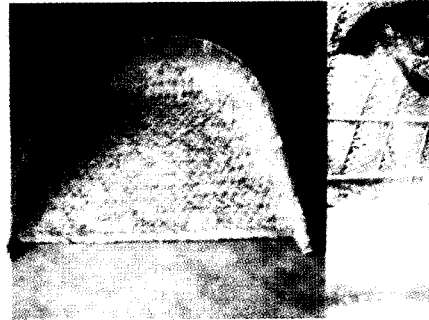


Fig. 12 Muram

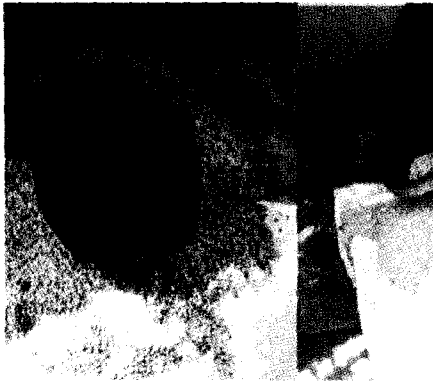


Fig.13 Salladai



Fig.14 Chekku



Fig.15 Ulakkai



Fig.16 Pukka



Fig.17 Marakaal

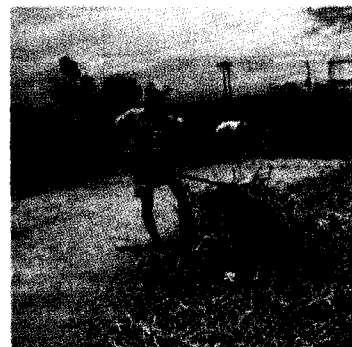


Fig.18 Sakkaipiratti

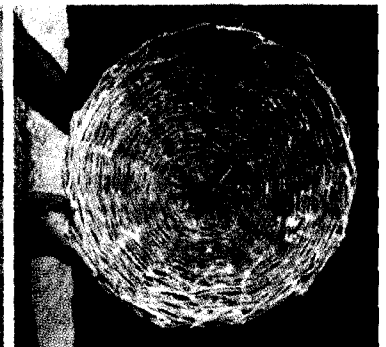


Fig.19 Moonghil thattu

by household women its average life is 10 yrs and costs Rs.100/unit.

Milling tool (*Ulakkai*): It is used for the process of milling, leaf extract preparation, etc. Handle is made up of wood and working area is made up of iron (Fig. 15). It has a length of 150 cm and diameter of 15 cm. Mostly women labourers operate it; its average life is 10 yrs and costs Rs 200/unit.

Measuring tools

***Pukka*:** It is made up of iron and used for measuring the grains of cereals, pulses and oilseed (Fig. 16). It can measure a weight up to 1½ kg. It has a length of 18 cm and diameter of 16 cm. Both men and women operate it.

***Marakaal*:** It is made up of iron and used for measuring the grains of cereals, pulses and oilseeds (Fig. 17). It can measure a weight of 4 kg. It has a length of 30 cm and diameter of 28 cm. Both male and women operate it. Average life is 20 yrs and costs Rs100/unit.

***Naali*:** It is made up of iron and used for measuring the grains of cereals, pulses and oilseed. It can measure a weight of 1 kg. It has a length of 15 cm and diameter of 10 cm. Both male and women operate it.

Average life is 20 yrs and costs Rs 35/unit. Easy to measure grains without taking the help of weight units and can be handled easily.

Other tools

Floor cleaner (*Sakkaipiratti*): Easy in the separation of grains from plant materials and cleaning works in threshing floor (Fig. 18). The tool is made up of iron and used for cleaning the threshing floor. After the threshing operation in crops like horse gram, the plant parts are removed with the help of the floor cleaner leaving the grains alone in the floor. This tool has a long handle and comb like base to ease the separation of plant materials after threshing. Length of handle is 200 cm and the base comb like structure has 30 cm height and 20 cm width. Operated mostly by male labourers, its average life is 10 yrs and costs Rs 140/unit.

Bamboo pan (*Moonghil Thattu*): It is made up of bamboo stick and used for the collection of plant products and broadcasting of seeds (Fig. 19). It has a depth of 12 cm and diameter of 25 cm. Both men and women operate it. Handling and transportation of FYM and grains are made easier and quicker with

help of the tool. Average life is 1-2 yrs and costs Rs.25/unit.

Conclusion

Indigenous Tools and implements are considered successful because these are economical, feasible and sustainable. It can spread quickly and easily from one region to another. Even these tools are common in use generally un-preferred since they lower the efficiency and increase tiredness of the operator. By using the modern wisdom, these traditional implements needed to be standardized keeping in mind the economy of rural poor. Proper designing in accordance with the

farmers requirements surely popularize these tool and implements in near future.

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