CHAPTER IV
ETHNIC FOOD GROWING TECHNOLOGY IN INDIA: A TYPOLOGICAL CLASSIFICATION OF AGRICULTURAL IMPLEMENTS
The tribes of India may broadly be divided on the basis of subsistence pattern into three categories: (1) Hunters and food-gatherers, (2) Shifting cultivators, and (3) Agriculturists. These three categories are not however exclusive and often they occur in combination. The hunting and food-gathering tribes like the Andamanese, the Kadors, the Chenchus, the Kharias, the Birhors, the Sauria Paharias and others know only the use of digging-sticks along with their hunting weapons, bows and arrows. But the shifting cultivators clear the land by cutting and burning the trees for sowing their seeds. Shifting cultivation, which is still a prevalent practice in different parts of India, is known by various names such as dahi and koman called by the Bhumiyas of Orissa, panda, dipta, parke by the Murias of Bastar, jhum in Assam, vichu by the Akas, podu by the Khonds of Jeypore, beora by the Korwas of Jashpur, and bavar by the Bagas of Madhya Pradesh and so on. The term 'shifting cultivation' is applied to widely different methods practised by different primitive peoples. The Birhors, for example cut and burn the jungles for casting the seeds for growing their cereals. Many tribal people of Madhya Pradesh, Assam and N.E.F.A. use different kinds of implements like the digging stick, scraper, hoe etc. for preparing the seed-bed, after cutting and burning the

1. This chapter is a revised version of an earlier article of the author (K. Guha, 1974).
trees. The Bhils, Santals, Oraons, Mundas and others have taken to settled cultivation by using the plough, following their Hindu neighbours.

According to Lowie, cultivation is a convenient catchword but it does not represent any real unit, because it is applied to diverse methods for sowing the seeds and the plantation of trees. Load Raglan divided the methods of cultivation of plants into three methods according to the implements used - the digging-stick, the hoe, and the plough. Edward Hahn considered two forms of farming - horticulture and agriculture. In the former the tillage is done by using such implements as are operated by hands and in the latter by plough drawn by domesticated animals. Again, Chappie and Coon have classified the agricultural operations into three main sources of energy: (1) Human muscular energy, (2) the energy of domestic animals, and (3) the energy of natural forces as applied through machines.

THE NEED FOR STANDARD NOMENCLATURE

The ethnographers generally have not taken much care in describing the agricultural implements accurately. The tribal monographs of Assam written by the earlier British ethnographers describe every long iron implement as a 'dao' every implement with teeth or prongs as a 'rake', the scraper as 'horse-shoe' or 'nectie hoe', the spade as 'double bladed dao', the pick

2. R.H. Lowie 1938, p. 291
3. L. Baglan 1939, p. 94.
as 'single-handed digger' or 'small triangular iron blade fitted like an adze' and so on. The spade and the hoe were often confused with each other in their identification. Harrison\(^6\) called 'spade' a kind of digging stick having a foot-rest for leverage. Raglan\(^7\) did not distinguish between hoe and spade; he called "English hoe" to an iron bladed implement in which the blade is at right angle to the haft and 'Dutch hoe' in which the blade is in prolongation of the haft. The term 'spade' is preferable to the term 'Dutch hoe', as the cutting edge of the tool is not at right angle to the plane of stroke. Structurally, the spade has a straight form and the hoe has an angular form.

Balfour\(^8\) found an 'embryological' significance in the bamboo scraper for the development of the hoes in Assam. But the hoe and the scraper have their different origins or structural developments. The origin of hoe can be traced from an angular form or pick attached with a stone or a metal blade whereas that of the scraper can be traced from a loop form. When these tools are described in ethnographical works, they should be carefully identified and assigned to their proper taxonomic categories or typology. Therefore, it is essential to understand the structure and function of these implements and to have a standard nomenclature.

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7. L. Raglan 1939, p. 95
8. H. Balfour 1917.
THE CLASSIFICATION OF IMPLEMENTS

The implements which are used by the primitive tribes of India may be classified accordingly as they are used for: (1) clearing the land, and (2) the preparation of soil.

I. IMPLEMENTS USED FOR CLEARING THE LAND

(A) For Burning Trees: Fire is used not only for cooking food, protection from animals in the night and other domestic purposes, but also for burning the jungle for shifting cultivation. Fire-making techniques are many but friction and percussion methods are most common among the Indian tribal people.

(1) FIRE-MAKING BY FRICTION Several forms of friction instruments are prevalent in India. They are as follows:

(a) Fire-drill: It consists of two pieces of wood. One is flat which is called 'hearth' and the other 'drill-stick'. The former, which is held horizontally on the ground, has a shallow pit or groove on the upper surface of it. The latter is twirled rapidly with its lower end by pressing it into the groove of the 'hearth'. The Bhils, Santals and many South Indian tribes burn the trees by producing fire by this method for their shifting cultivation.

(b) Fire-saw: It consists of two pieces of wood or bamboo, one is drawn back and forth across the other. The Kadars use it for their shifting cultivation.

(c) Sawing-thong: It consists of a flexible thong or
strip made of shaved bamboo or cane or bark fibre etc. and a solid piece of wood or bamboo. The thong is pulled backward and forward across the solid piece of wood or bamboo. The Sema and Rengma Nagas produce fire by this method for jhum cultivation.

(2) FIRE-MAKING BY PERCUSSION: By striking two stones together, or an iron on a flint, fire may be produced. This method is commonly called "strike-a-light". In Assam (NEFA) and Tehri Garhwal, this method is prevalent. The Santals who also practise this method call it chakmak.

(B) FOR CUTTING TREES:

(1) Axe: The primary function of an axe is to cut wood with a blow; so in primitive culture, it is commonly used for clearing the jungles in shifting cultivation. The implement has a haft and a blade; the cutting edge of the blade runs parallel to the haft. In India there are two varieties of axe. One is socketed and the other tanged. In the former, the haft is introduced into the socket of the blade but in the latter the blade has a tang to fix into the haft. The socketed axe is used everywhere in India except its eastern part (Assam and NEFA), where the tanged axe is commonly used by many tribals for jhum cultivation.

(2) Adze: For making this implement, a flat iron blade is attached to a haft in such a way that the cutting edge lies at a right angle to the haft. It is used for chiselling wood and not for cutting trees for shifting cultivation.
(3) Hedging Instruments: These implements are used for cutting and pruning the hedges and shrubs etc. They are of the following varieties.

(a) Hedging-sword ("Matchet"): Long and sharp iron blade is made to cut the hard stalks of grass, shrubs and thorny bushes. The blade of these swords is either flat, or curved at the top, or has a slight spiral twist at the middle. The haft is either small or absent. In Delhi, such swords are used for clearing the bushes by the gardeners and are called natt or talwar.

(b) Chopper ("Hatchet"): The implement is to cut twigs and shrubs with a sudden blow and for this reason, the centre of balance is nearer the blade than the haft. The blade is, therefore, heavier than the haft. The tribal folks of Assam and N.E.F.A. use the chopper to cut down trees as well as to dig the soil. The chopper is of two kinds: (1) Solid chopper having the haft and blade made of one piece of iron; and (ii) Composite chopper consisting of an iron blade and a wooden or bamboo haft. Jangken used by the Tangsas is an example of solid chopper and azhta or 'Naga dao' is an example of composite chopper.

(c) Hedging-knife ("Bill hook"): It forms a large class of knives, differing mainly in size and shape, used for cutting grass, hedges, shrubs etc. The important point to distinguish these knives from the choppers is that in these implements the centre of balance is nearer the grip or the haft than the blade.
The haft may be short or long, plain or with a 'stop' at the butt end to prevent the implement from slipping out of the hand. Wait buoh, used by the Khasis for cutting the branches of trees, has a long handle and a curved iron blade. Dath, which is used in Simla, is an example of scythe-like hedging-knife with a stop at the butt end.

(d) Hedge-bill: In this implement, the haft is attached with a head consisting of a knife at one side, an axe on the other, and a pointed blade at the top. The Khonds of Orissa use this kind of implement for clearing the jungle during their hunting expedition.

II IMPLEMENTS USED FOR THE PREPARATION OF SOIL

(a) Implements Used by Hand Power

1. SCRAPERS OR LOOP FORMS: The implements are made of bamboo or iron having a sharp edge, used for scraping the ground. They are of two kinds: (i) Simple scraper: Made of a flexible bamboo split bent at the middle in such a way that a small loop is formed and the crossed ends are roped together with cane strips or one of them is fixed in a notch cut on the other and both combinedly form the grip. It is used by the tribal people of Assam and N.E.F.A., especially the Semas, Angami Nagas, Gallongs and others for preparing the seed-bed. (ii) Composite scraper: Has a curved iron blade, two ends of which are either tied with two crossed bamboo sticks or fitted parallel to each other into a wooden haft. Used by the Lhotas, Aos, Konyaks, Semas, Tangsas and other tribes of Assam and N.E.F.A.
2. STRAIGHT FORMS: The haft of these implements is in prolongation of the working end. To use them, they are either pushed forward or pressed downward. Subdivision of these implements are: (a) Digging stick, (b) Spade, (c) Garden spade and (d) Spading fork.

(a) Digging-stick ("Bibble"): The digging stick, a pointed implement, is the forerunner of the spade. Three kinds of digging stick may be distinguished. (i) Simple digging-stick: The simplest type has a long branch (of a tree) whose one end is pointed and sometimes hardened by fire. The Andamanese, Birhors, Garos, Chenohus, Kadars, Saurias and Mal Paharias use this type. (ii) Modified digging-stick: To make the digging-stick more effective, an extra device for leverage is used with the haft like a heavy stone ring fitted at the top to increase the weight of the thrust or to have a foot rest to give an additional force to the thrust by pressing the foot rest by the operator's foot. In Rajasthan, an implement called oob is used by the Saharivas for digging holes in the ground. It is made of a forked branch of a tree and it has two hafts, each of which is held vertically with one hand and it is pressed downward with the foot at the base where the two hafts meet to make the foot-rest. (iii) Composite digging-stick: It is an improved kind of digging-stick, having a wooden haft equipped with a stone or shell or iron point which does not break easily and can dig the soil more efficiently. The Kharias of Chota Nagpur fix an iron point with the digging-stick to make an
effective implement for digging hard soil. The Kadars of Cochin also use this kind of implement called para kole. In the hilly regions of Rajasthan and Punjab the composite digging-sticks are commonly used by the local peasants. There are various hafting methods for composite digging-sticks like (a) tang, (b) socket, and (c) overlapping joint.

(b) Spade: The Spade is a paddle or shovel-shaped implement having a long haft and flat blade. It may be regarded as an advance form of digging-stick as the latter is not adequate to cut and turn over the soil sufficiently for cultivation. The spade differs from the digging-stick in that the blade of the spade is much broader than the breadth of the haft, but is just opposite in the case of the digging-stick. The spade may be too long or too short in size. The spades are of three kinds: (i) Simple spade: The haft and the blade are made of one material which may be one piece of wood or of iron. Kunj used by the Murias of Bastar, Madhya Pradesh, is an example. (ii) Composite spade: The blade is made of different material than that of the haft. The livan used in Kashmir is partly made of wood and partly of iron. Another example is khonta of Bengal. (iii) Modified spade: An additional leverage or foot rest is used with the haft to give an additional pressure to the implement. It is used in Afghanistan but not in India.

(c) Garden spade: Small instruments nearly one foot in length, generally used for gardening purposes and is of two types:
(i) **Long-necked.** It has a long shaft or "neck" in addition to a short handle to prevent the fingers of the operator from being shafted by roughness of the ground. *Nirani*, which is used in Bengal, is an example.  
(ii) **Trowel-shaped.** It has a handle which is on a higher plane than that of the blade either by bending the tang Z-like or by carving the handle in a semi-circular fashion so that the fingers of the operator may not be chafed by roughness of the ground. *Khurni*, which is used in Bengal (with Z-like tang) and *Khurna*, which is used in Northern India (with semi-circular handle) belong to this type.

(d) **Spading fork.** This has a wooden haft and four or five parallel iron prongs at the working end. It is used for digging as well as for drawing the earth. *Kanta*, used in Delhi, is an example. Flails which are homologous to the spading forks are used for threshing corns only. *Jeli*, which is used in Delhi for threshing corns, is an example of flail.

3. **Angular forms:** An angle is formed by joining the haft with the blade. To use them, unlike the straight forms, they are pulled towards the operator. Subdivisions of these implements are: 
(a) **Pick,** (b) **Pick and Mattock,** (c) **Hoe,** and (d) **Grubber.**

(a) **Pick:** The pick is the forerunner of the hoe. The pick is of two kinds. (i) **Simple pick** (or Hack): The pick is either made of a natural forked branch of a tree or of two separate branches set in an angular form and roped together, one being haft and the other working end. The picks are used for digging
and turning up the soil. Kawibbattingtek used in Mizo Hills of Assam, dewash used by Red Kaffirs of Afghanistan and the Swedish hack are best examples of simple pick. (ii) Composite pick: To make the pick more efficient, the working end is equipped with stone, bone, shell or iron blades. Iron is the most common material used for making the blades or points of composite picks in India but the methods of hafting are not same everywhere. Like other composite implements, the hafting methods may be tanged, socketed, flanged, and overlapping joint. In the hilly regions of India, the natives commonly use the composite picks. Khudi, which is used by the Garwalis in Dharmasala, is an example of composite pick. In manuals the composite picks are generally described as hoes.

(b) Pick and mattock: It has two blades on both sides of the haft, one is pointed and the other little flat and sharp. The pointed end is used for digging and the flattened end for cutting earth. In Delhi it is locally called Geety.

(c) Hoe: The hoe is a composite implement in which the haft and the blade are made of different materials; the cutting edge of the blade lies at the right angle to the haft and thus it is structurally similar to an adze. The hoe may be regarded as an advance form of a pick, as the hoe is adequate to turn over a large amount of soil than the pick. But ethnographers generally do not distinguish between the pick and the hoe. The pick has a narrow pointed blade and its breadth never exceeds that of the haft in the case of the hoe. The cutting edge of the
hoe may be straight, pointed or semi-circular, the Kodal of Bengal and Phawra of Northern India are suitable example of the hoe. The hoe may be hafted differently by a tang, socket, flange and cord. The broad bladed hoe is commonly mistaken as spade.

(d) Grubbing-hoe or Grubber: The grubbers are provided with two or more strong tines instead of a flat blade like a hoe and a handle which is at right angle to the working ends. They are generally used for digging, weeding and drawing the earth. They are of two kinds: (i) Simple grubber: "Akawa or achake", as Hutton describes, "is made of a stick split up at one end, with the split parts bent at right angles, dried and hardened so as to make four or five fingers of more or less equal length sticking out from the end of the stick, and tied with cane to keep them at right angles to the handle".9 But Hutton calls the implement a 'rake'. It is used by the Sema Nagas and other neighbouring tribes of Assam. (ii) Composite grubber: It has a bamboo or wooden handle and an iron blade having two or more metal tines. Kakri Pashni used in Bengal is an example.

4. LEVELLERS: These implements are used to level an uneven surface. Subdivisions of these implements are:

(a) Clod-breaker: (or Mallet): The implement consists of a haft and a head and it is used for striking and crushing the clods. A clod-breaker is either hammer shaped or club shaped. The hammer shaped clod-breaker is most common in India.

(b) T-shaped leveller: A long pole of haft is attached

at one end with a transverse piece of wood or board. The Murias of Bastar (Madhya Pradesh) drive such leveller to spread the ashes over the field and they call this as Karlat or balle. Sometimes the leveller gets the shape of a wooden hoe and has a semi-circular wooden board with which the handle is attached. In Lower Assam, this kind of implement is used for levelling the earth and it is called hatami.

(c) Rake: The implement has a long haft which is attached at one end with a transverse piece of wood or iron which is furnished with spikes or teeth. It is used for levelling the uneven ground as well as for drawing the earth together. It is also used for gathering the ashes after burning the trees. As both the rake and grubber are furnished with spikes or tines, sometimes it becomes difficult to distinguish them. The rake differs from a grubber in that the rake is much longer in size and the operator uses it in his standing position. Moreover, unlike the grubber, the rake is not used for digging the soil. A rake is either Solid or Composite. In the former the haft and the head are made of one piece of iron. In the latter, an iron head is fitted with a wooden haft. Panji, (five pronged rake) used by the gardeners of Delhi, is an example of solid rake. Datali, also used in Delhi, is a suitable example of composite rake.

(B) IMPLEMENTS DRAWN BY ANIMAL POWER:

1. PLOUGH: The parts of a plough are: (a) the body, (b) the beam, and (c) the yoke. The body has the following
constituent parts: (i) the handle is either a separate piece of wood vertically fixed on the shoe of the plough or carved from the same piece of wood, of which the shoe is made. (ii) The grip may be made of a separate piece of wood or the upper most part of the handle is bent or projected backward to form the grip. (iii) the shoe is that part of the body which rests on the ground during operation. (iv) The share, which is to cut the soil, may be socketed, flanged, tanged or chisel type. The beam, a long, straight or curved piece of wood, forms a link between the body and the yoke. The yoke, which is a separate frame of wood, is of two types (a) single neck; and (b) double neck. The plough may be classified into five types. They are: (1) Beam and (2) Body ard; (3) Sole ard; (4) Triangular ard; and (5) Quadrangular ard. The body ard and the sole ard ploughs are commonly used in India.

2. HEAVY LEVELLERS: They are used for levelling the ground and they are drawn by animals. Sub-divisions of these implements are:

(a) Wooden plank (or Board): Wooden bar or plank or board is fitted with a wooden beam and is drawn by animals. It is attached to two bullocks or buffaloes by means of a beam and a yoke. The operator stands on it and drives the animals. The Kharias of Chota-Nagpur use the wooden planks called pata for levelling after ploughing the field or after sowing the seeds.

(b) Ladder: Two parallel bamboo or wooden poles are joined by means of transverse bars. It is connected to a yoke.

10. See H.J. Hopfen 1969, p. 49.
by means of a beam or ropes. Bullocks or buffaloes are harnessed with the yoke and the operator standing on the ladder drives the animals to draw it. It is commonly used in wet cultivation in Bengal and Bihar.

(c) Harrow: Harrows are used for seedbed preparation to cover seeds, destroy weeds, break clods, and for levelling the ground.

(i) Spike-tooth Harrow: A transverse bar (wood or iron) furnished with tines or spikes, is used for tearing and breaking the clod and for levelling the ground. It is fitted with a beam or tied by means of ropes to a yoke. To operate it, the operator stands on the transverse bar of the harrow with teeth facing the ground and then he drives the animals which are harnessed with the yoke. The Santals of Bihar and the Puruns of Manipur use this kind of levellers.

(ii) Blade Harrow: The blade harrow is used for weeding, tilling and levelling the soil simultaneously. It has a heavy wooden body with two wooden projections at the base and a handle at the top. An iron blade is transversely fixed with the wooden projections. The cross-section of the body is octagonal. A bamboo shaft is splitted into two halves and fitted into the body for making the beam. The Korkus of Melghat (Berar) use the blade harrow for cultivation of their plants. It is called wakhar. K.P. Chattopadhyay describes it thus, "There is a gap behind the blade, between it and the body. The earth which is
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turned up by the blade falls in the gap; lumps and clods are broken by the heavy body. 11 This type of blade harrow is also used in Ceylon.

To sum up, there is no standard nomenclature for primitive agricultural implements and the ethnographers do not generally describe the native implements in a scientific manner. The Manuals dealing with agricultural implements do not include the tribal agricultural implements in them. A systematic classification of agricultural implements used by the tribal peoples and common in certain geographical regions of India is attempted in this chapter. The study is specially oriented towards the shifting cultivation and primitive tillage implements used by the tribal peoples of India.

11. K.P. Chattopadhyay 1954, p. 112. Following him, Indian ethnographers describe this kind of implement as a plough. But B.J. Hopfen (1939, p. 72) has described it correctly— as a blade harrow.