

Development of Agriculture in Ancient India

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INTRODUCTION

The *Sanskrit* equivalent for agriculture is *Kṛṣi* and it is common to almost all the Indian languages. The *Sanskrit* literature is replete with the references on *Kṛṣi*. The term *Kṛṣi* occurs in the *R̥gveda* quite a number of times, indicating their familiarity with cultivation. Post *Vedic* literature provides more detailed information on agriculture and its various aspects. *Kṛṣi* i.e. agriculture is known as dragging, pulling, ploughing, tilling of the soil and all the things related to them.

In effect, from time immemorial, agriculture has been the chief source of livelihood to people of in India and corner stone of Indian economy. It has been the main productive activity in India. Going by the ancient *Sanskrit* literature, the agriculture was considered to be best among all occupations. Main reason behind it was that agriculture was the very basis of leading the life with happiness and prosperity.

ORIGIN OF AGRICULTURE

According to the *Mārkaṇḍeya Purāṇa*, *Brahmā* was regarded as the first inventor of Agriculture.¹ According to this *Purāṇa*, in the beginning of the creation of the earth, the soil yielded almost all type of corns, vegetables and fruits etc. However, as the time passed, the soil became unproductive. Thereafter, *Brahmā* churned the soil, and got various kinds of seeds. This seeds on their own accord started giving corns, fruits etc. Later on *Brahmā* realized that these seeds were also not growing properly. Then He brought the agriculture into practice. Seeing the ability of different classes of the people in the society he initiated one class of the people to do this profession of agriculture. Since then the agriculture depended on human toil.

However, according to the *Atharvaveda*², *Viṣṇu Purāṇa*³, and *Śrīmad Bhāgavad Mahāpurāṇa*⁴, a king named *Pr̥thu*, the son of a king *Vena* was regarded as the inventor of agriculture. *Pr̥thu* may be considered as a king who effectively brought the agriculture into practice. In the *Atharvaveda*, King *Pr̥thī Vainya* has been said to be inventor of agriculture. It is he who for the first time did farming and grew grains.

¹ *Mārkaṇḍeya Purāṇa*-46/65-75

² *Atharvaveda*-8/10/11

³ *Viṣṇu Purāṇa*

⁴ *Śrīmad Bhāgavad Mahāpurāṇa*-4/18/29-32

IMPORTANCE OF AGRICULTURE

It goes without saying that agriculture was given due importance in ancient India. *Vedic* seers knew that agriculture was the only option for food security. Food, as everybody knows, is basic necessity of human being. Agriculture is helpful in attaining all the four goals (पुरुषार्थ चतुष्टय) of life. Human life is dependent on *Anna* and production of *Anna* is dependent on agriculture. Hence, agriculture is basic necessity of human life. *Yajurveda* says that one should make effort for producing abundant grains through agriculture.⁵ Men depend for their lives on agriculture-ते कृषिं च सस्यं च मनुष्या उपजीवन्ति।⁶ Speaking about the importance of agriculture, *Vedic* seer says-O gambler, stop gambling, and engage yourself in agriculture, which is regarded as most valuable wealth, so that you will earn wealth, happiness, cattle and happy married life. You respect this wealth and be content with this wealth-

अक्षैर्मा दीव्यः कृषिमित् कृषस्व वित्ते रमस्व बहुमन्यमानः।

तत्र गावः कितव तत्र जाया तनमे वि चष्टे सवितायमर्यः।।⁷

The *Rgveda* further adds that the cultivator is bound to get plentiful crops and immense wealth.⁸

The *Atharvaveda* also highlights the importance of agriculture. Agricultural work used to be practiced by skilled persons. Poets and scholars took this occupation and did farming for happiness. Agriculture was a delighted occupation in which Gods like *Indra* and *Puṣā* were also engaged. Success in agriculture leads to success in life.⁹ The person possessing abundant food grains is respected as a great man in the society.¹⁰ Through agriculture one can acquire vigour, energy and power.¹¹ In the *Yajurveda* and *Taittirīya Saṃhitā* agriculture is regarded as the means of human welfare. It is the source of prosperity and sustenance. It gives grain, strength and lustre.¹² In *Taittirīya Saṃhitā* agriculture has been described as *Chandas* (metre).¹³ In other words, it is the music that fills human life with delight. *Chandas* also means covering. As agriculture keeps human beings with happiness, it is known as *Chandas*. *Bṛhatpārāśara* says that there is no other religion than agriculture and no profitable business other than agriculture-‘कृषेरन्यत्र नो धर्मो न लाभः कृषितोऽन्यतः’¹⁴ It further

⁵ *Yajurveda*-4/10

⁶ *Atharvaveda*-8/10/12

⁷ *Rgveda*-10/34/13

⁸ *Ibid*, 7/39/2

⁹ *Atharvaveda*-8/10/24

¹⁰ *Aitreya Brāhmaṇa*-2/5

¹¹ *Taittirīya Saṃhitā*-9/3/7/3

¹² *Yajurveda*-9/22, *Taittirīya Saṃhitā*-4/3/7/2-3

¹³ *Taittirīya Saṃhitā*-4/3/7/1

¹⁴ *Bṛhatpārāśara*-5/185

adds that there is no other means than agriculture for obtaining happiness, food, clothing, respect etc.¹⁵

Kāśyapīyakṛṣisūkti mentions that production of grains and other vegetation are the sole purpose of highest fulfilment of the earth. The rich earth full of vegetation is the cause of growth of living beings-

सस्यादिरेव मेदिन्याः परोधर्मः परं यशः। सस्यपूर्णा वसुमती प्राणिनां प्राणवर्धिनी।¹⁶

It further adds that it is the giver of all auspicious things, leading to the satisfaction of Gods especially with its perpetual power to produce grain and fountains of sweet water-

सर्वमङ्गलदात्री च देवानां तुष्टिदायिनी। नित्यसस्या च मधुरजलस्रावा विशेषतः।¹⁷

Sages with divine insight eulogize agricultural business as the basis of sacrifice and as life giver of living beings-

यज्ञानामपि चाधारः प्राणिनां जीवदायकम्। कृषिकर्म प्रशंसन्ति मुनयो दिव्यचक्षुसः।¹⁸

Men should exert and devote themselves to farming whether they get farmlands from a king or purchase one for themselves-

नृपात् प्राप्तं स्वतःक्रीत सस्यक्षेत्रं तु मानवाः। संप्राप्य यत्नवन्तश्च कृषिकार्यकृतादराः।¹⁹

They are said to please gods and sages. Of all wealth, agriculture is the highest wealth-

देवानां च मुनीनां च मे मताः प्रीतिदायिनः। घनानामपि सर्वेषां कृषिरेव परं धनम्।²⁰

As this wealth cannot be taken away by others, it is commended by everyone. Yielding profuse returns, it provides pure grains and other things which please Gods-

परैरग्राह्यमादिष्टं सर्वश्लाघ्यं महाफलम्। देवानां प्रीतिजनक शुद्धद्रव्यप्रदायि तत्।²¹

Keeping away dependence on others, always yielding wealth, it provides for the guests, deities, and one's own family-

पारतन्त्र्यहरं चैव नित्यम लक्ष्मीविलासकृतम्। तथातिथीनां देवानां स्वकुटुम्बस्य जीवदम्।²²

Giving delight in several ways, the profession of farming is indeed praiseworthy. Any other livelihood involves dependence-

नानाविधानन्दकरं कृषिकर्म प्रशस्यते। अतस्तदन्या वृत्तिस्तु पारतन्त्र्येण गुम्भिता।²³

¹⁵ Ibid, 5/186-187

¹⁶ *Kāśyapīyakṛṣisūkti*-1/18

¹⁷ Ibid, 1/19

¹⁸ Ibid, 1/235

¹⁹ Ibid, 1/236

²⁰ Ibid, 1/237

²¹ Ibid, 1/238

²² Ibid, 1/239



The natural inclination of people towards agriculture pleases Gods and be nurtured with special effort as it sustains life of all living beings-

कृषिप्रवृत्तिं सर्वेषां देवानां प्रीतिदायिनीम्। यत्नतो रक्षयेयुस्तां जीवानां जीवनप्रदाम्।²⁴

Sages are of the opinion that farming activity should be planned and undertaken in every community, in every country, in every rural part, and in every tableland-

वने जनपदे देशे क्षेत्रे ग्राम्ये भृगोस्तटे। कृषिप्रवृत्तिं संकल्प्यां मन्यते हि मुनीश्वराः।²⁵

Sages of ancient times have pursued agricultural activities even on open yards of cottages with a view to benefit all beings-

पुरातनैस्तु मुनिभिरुटजाङ्गणभूमिषु। कृषिकर्मकृतं लोके सर्वप्राणिहितार्थिभिः।²⁶

Undertaking in agriculture is to be pursued by all great men of sharp intelligence to get permanent joy-

अतः कृष्यादानमेतत् सर्वैः पुरुषपुङ्गवैः। सूक्ष्मधीभिरिहासेव्यं शाश्वतानन्दहेतवे।²⁷

Kṛṣiparāśara has discussed the importance of agriculture. It says that even a learned Brahmin who is proficient in all the four Vedas, who recites *Śāstras* and is intelligent, when is overpowered by *Alakṣmī*, is reduced to humiliation caused by begging for food with folded hands. And only through farming, one however ceases to be a suitor. By practicing agriculture alone one is bound to be *bhūpati* (master of the earth). People even having surplus of gold, silver, jewels and garments have to solicit farmers as earnestly as a devotee would pray God. People in spite of having gold ornaments in their necks, ears and hands have to suffer from hunger in absence of food. Food is life, food is also the strength, food is everything. The divines, the demons, and all human beings depend on food for surviving. Food, verily, comes from grains and grains cannot be available without agriculture. Therefore, leaving everything else one should strive for farming. Blessed is agriculture, holy is agriculture, and agriculture is life of all living creatures-

चतुर्वेदान्तगो विप्रः शास्त्रवादी विचक्षणः। अलक्ष्म्या गृह्यते सोऽपि प्रार्थनालाघवान्वितः।।

एकधा च पुनः कृष्या प्रार्थको नैव जायते। कृष्यान्वितो हि लोकेऽस्मिन् भूयादेकश्च भूपतिः।।

सुवर्णरौप्यमाणिक्यवसनैरपि पूरिताः। तथापि प्रार्थयन्त्येव कृषकान् भक्ततृष्णया।।

कण्ठे कर्णे च हस्ते च सुवर्णं विद्यते यदि। उपवासस्तथाऽपि स्यादन्नाभावेन देहिनाम्।।

²³ Ibid, 1/240

²⁴ Ibid, 1/244

²⁵ Ibid, 1/245

²⁶ Ibid, 1/246

²⁷ Ibid, 1/248



अन्नं प्राणा बलं चान्नमन्नं सर्वार्थसाधनम्। देवासुरमनुष्यश्च सर्वे चान्नोपजीविनः।।

अन्नं हि धान्यसञ्जातं धान्यं कृष्या विना न च। तस्मात्सर्वं परित्यज्य कृषिं यत्नेन कारयेत्।।

कृषिर्धन्या कृषिर्मेध्या जन्तूनां जीवनं कृषिः।²⁸

Various *sūktas* of *R̥gveda* such as *Kṣetrapati*²⁹, *Parjanya*³⁰, *Pr̥thvī*³¹, *Go*³², *Āpaḥ*³³, *Akṣa*³⁴, *Viśvedevā*³⁵ and *Aranyani*³⁶ have well described in the importance of agriculture. Similarly various *sūktas* of *Atharvaveda* including *Kṛṣi*³⁷, *Anna*³⁸, *Anna samṛddhi*³⁹ have talked about the significance of agriculture.

Here one *sūkta* namely *Kṛṣi sūkta* from *Atharvaveda* is quoted in totality-

सीरा युञ्जन्ति क्वयों युगा वि तन्वते पृथक्। धीरा देवेषु सुम्नयो।।⁴⁰

i.e. the men of wisdom and firm attitude bind plough fast and harness the yokes on the side to attain the wealth of grains among the men of learning.

युनक्तु सीरा वि युगा तनोत कृते योनौ वपतेह बीजम्।

विराजः श्रुष्टिः सभरा असन्नो नेदीय इत् सृण्यः पक्वमा यवन।।⁴¹

i.e. O' Ye peasants; lay on the plough, harness the yokes, sow seeds in the races formed, and when the earnings are fraught with plenty of grain and after sometimes when grains are ripe reap with sickle.

लाङ्गलं पवीरवत् सुशीमं सोमसत्सरु। उदिद् वपतु गामविं प्रस्थावद् रथवाहनं पीवरीं च प्रफुर्व्यम्।।⁴²

i.e. The sharp-shared plough, that brings out happiness and that is furnished with traces and with stilts, becomes the means of having cow, sheep, rapid chariot and strong blooming woman.

इन्द्रः सीतां नि गृह्णातु तां पूषाभि रक्षतु। सा नः पर्यस्वती दुहामुत्तरामुत्तरां समां।।⁴³

²⁸ *Kṛṣiparāśara*-2/8

²⁹ *R̥gveda*-4/57

³⁰ *Ibid*, 5/83

³¹ *Ibid*, 5/84

³² *Ibid*, 6/28

³³ *Ibid*, 7/47

³⁴ *Ibid*, 10/34

³⁵ *Ibid*, 10/101

³⁶ *Ibid*, 10/146

³⁷ *Atharvaveda*-3/17

³⁸ *Ibid*, 6/17, 7/58

³⁹ *Ibid*, 6/142

⁴⁰ *Ibid*, 3/17/1

⁴¹ *Ibid*, 3/17/2

⁴² *Ibid*, 3/17/3

May *Indra*, the air with rain make furrow normal, may the Sun preserve its fertility. May the well irrigated yield us good crop through each succeeding year.

शुनं सुफाला वि तुदन्तु भूमिं शुनं कीनाशा अनु यन्तु वाहान्।

शुनासीरा हविषा तोशमाना सुपिप्ला ओषधीः कर्तमस्मै।⁴⁴

Let the plough-shares turn up the plough-land in happiness and let hard-working ploughers go with oxen in happiness. Air and Sun nourishing the earth with water, cause our plants, bear abundant food.

शुनं वाहाः शुनं नरः शुनं कृपतु लाङ्गलम्। शुनं वरत्रा बध्यन्तां शुनमष्टामुदिङ्गय।⁴⁵

Let the bulls and horses pull the ploughs happily, let the men work happily, let the plough turn out land nicely, let the traces be bound and let the driving goad be happily plied.

शुनासीरेह स्म मे जुषेथाम्। यद् दिवि चक्रथुः पयस्तेनेमामुप सिञ्चतम्।⁴⁶

Let the air and Sun be favourable to me. They bedew this Earth with water which they create in sky.

सीते वन्दामहे त्वावाचीं सुभगे भव। यथा नः सुमना असो यथा नः सुफला भुवः।⁴⁷

We praise the furrow and let it be directly favourable for us. May it be fruitful for us.

घृतेन सीता मधुना समक्ता विश्वेदेवैरनुमता मरुद्भिः।

सा नः सीते पयसाभ्याववृत्स्वोर्जस्वती घृतवत् पिन्वमाना।⁴⁸

Let the furrow be beswed with butter and honey and be made favourable for crops by all the physical forces and various kinds of airs. Full of grains and enriched with butter let this furrow make us happy with various cereals.

In effect, the agricultural work was considered to be pious job.⁴⁹ The *Rgveda* directs even the elite class of the society to perform the job of agriculture as it was considered to be equivalent of *Yajña*.⁵⁰ *Rgveda* mentions some experts in agriculture who knew how to increase the output of agriculture.⁵¹ According to the *Atharvaveda*, food is the basic necessity for human beings. But the availability of food depends of agriculture. People well versed in agricultural activities were considered to be highly respectable and successful in their

⁴³ Ibid, 3/17/4

⁴⁴ Ibid, 3/17/5

⁴⁵ Ibid, 3/17/6

⁴⁶ Ibid, 3/17/7

⁴⁷ Ibid, 3/17/8

⁴⁸ Ibid, 3/17/9

⁴⁹ *Rgveda*-10/117/7

⁵⁰ Ibid, 10/101/3-5

⁵¹ Ibid, 1/161/2

endeavour.⁵² *Vālmīki Rāmāyaṇa*⁵³ and *Mahābhārata*⁵⁴ are also of the opinion that people engaged in agriculture are bound to lead a happy and prosperous life. According to *Śukranīti*, agriculture of a land irrigated with river water is the best means of one's livelihood.⁵⁵

ESSENTIALS OF AGRICULTURE-

Agriculture depends on many factors. Some of them are soil, farmers, seeds, farming techniques, agricultural implements, irrigation, manures etc. Most of these factors would be discussed at length in relevant chapters, however, some of the factors will be discussed here itself.

Farmer-

Farmers are an integral part of an agricultural system. No one can even think of agricultural practices sans farmers. Hence, farmers have been highly placed in *Sanskrit* literature. Farmers have been termed as *Kṣetrapati* in *Sanskrit* literatures apart from *Kṛṣaka*, *Kṛṣika*, *Kṛṣīvala*, *Karṣaka* etc. The word '*Kināsa*' has also been used for farmer in *Vedas*. Describing the significance of farmer, a seer of *Ṛgveda* says-We will be victorious and happy with the association of our friend and owner of the field-*Kṣetrapati*. Let the owner of the field bestow upon us cattle, horses and nourishment.⁵⁶ A seer of *Yajurveda* salutes owner of the land-क्षेत्राणां पतये नमः।⁵⁷ *Atharvaveda* says that those actually working in the fields are the real owner of the lands.⁵⁸ *Brhatpārāśara* says that a farmer favours all living beings by supplying food grains to them through his noble service in the field. All sacrifices depend upon farmers. Farmer helps to fill the treasury of a king by paying himself the taxes and making others able to pay tax. The farmer feeds ancestors (manes), various deities and people-

सर्वसत्वोपकाराय सर्वयज्ञोपसिद्धये। नृपस्य कोशवृद्धर्थं जायते कृषिकृन्नरः।।

पितृदेवमनुष्याणां पुष्टये स्यात् कृषीवलः।⁵⁹

According to *Pāṇini* there are three kinds of farmers-

Ahali-Farmers who do not have their own ploughs.

Suhali-Farmers who are in possession of good land or ploughs.

Durhali-Farmers who have old ploughs.

The *Atharvaveda* gives importance to the education of farmers for the country to attain strong economy. The farmers educated in *Vārtā Vidyā* can produce more in the field. According to *Atharvaveda*, in the country where the *Vārtā* is not advertised and popularized,

⁵² *Atharvaveda*-8/10/42-43

⁵³ *Vālmīki Rāmāyaṇa*-2/100/47

⁵⁴ *Mahābhārata-Sabhāparva*/5/80

⁵⁵ *Śukranīti*-3/276

⁵⁶ *Ṛgveda*-4/57

⁵⁷ *Yajurveda*-16/18

⁵⁸ *Atharvaveda*-3/17/5

⁵⁹ *Brhatpārāśara*-5/159

the farmers not educated, there will be no good yield in the fields. Farmers will not be able to get crops in plenty. Thus the economic condition of the individual and also of the nation becomes weak.⁶⁰ *Bṛhatpārāśara* says that a educated and well behaved farmer will never be poor and unhappy.⁶¹ *Manusmṛti* says that the farmers should have sufficient knowledge about seeds, proper season for cultivation, the good and bad qualities of the soil, he should be well conversant with the measurement of the field, rainfall and the effects of other natural forces-

बीजानामुत्तिविच्च स्यात्क्षेत्रदोषगुणस्य च। मानयोगं च जानीयात् तुलायोगांश्च सर्वशः।।⁶²

The *Mahābhārata* prescribes that king should give loans in the form of cash, seeds, implements etc. to the farmers and thus encourage them to get more yield from the field.⁶³

Each and every member of the society should help those involved in agricultural activities. According to *Kāśyapīyakṛṣisūkti*, Kings, *Kṣatriyas*, wealthy people, *Vaiśyas*, and the *Sudras* should all assist farmers in their agricultural ventures for the benefit of the people-

भूपालैः क्षत्रियैरेवं धनिकैर्वैश्यकैरपि। कृषिकार्येषु तैः साह्यकार्यं लोकहिताय च।।⁶⁴

Help to agriculture has been said to be religious as well as conducive to success and health. Therefore, kings, warrior class, *Brāhmaṇas*, *Vaiśyas*, and *Sudras* should render help to agriculture in the measure of their capacity, which would be yielding great fruit. This can be done through donations of different types of seeds and cattle-

धर्म्यं यशस्यमायुष्यं कृषिसाह्यमितीरितम्। भूपालैः क्षत्रियैस्तस्मात् ब्राह्मणैः वैश्यकैरपि।।

शुद्रैरपि यथाशक्ति कृषिसाह्यं महाफलम्। नानाविधानां बीजानां गवामपि दानतः।।⁶⁵

Great sages have said that abundant merit is acquired through donation of land, digging of wells, protection of agricultural fields, construction of water reservoirs and especially of wells, and establishment of charitable institutions for food. Great merit accrues by assisting agriculture-

जलाशयस्थापनाद्वा वाप्यादीनां विशेषतः। अन्नशालास्थापनाद्वाकृषिसाह्यं महाफलम्।।⁶⁶

Helping in agriculture according to one's capacity is stated to yield great rewards-

गवां च संरक्षणतो ब्राह्मणानां विशेषतः। यथाशक्तिक्रियासाह्यं महाफलमुदीरितम्।।⁶⁷

⁶⁰ *Socio-economic ideas in Ancient Indian Literature*, p 20

⁶¹ *Bṛhatpārāśara*-5/187-188

⁶² *Manu Smṛti*-9/330

⁶³ *Mahābhārata-Sabhāparva*-5/68

⁶⁴ *Kāśyapīyakṛṣisūkti*-1/198

⁶⁵ *Ibid*, 1/199-200

⁶⁶ *Kāśyapīyakṛṣisūkti*-1/201-202

⁶⁷ *Ibid*, 1/203

Discussing characteristics of good farmers, *Kāśyapīyakṛṣisūkti* says that those who are engaged in agricultural pursuits should be free from hypocrisy, jealousy etc. seeking mutual interests-

कृषिकार्यरता ये तु पुरुषाः ग्रामवासिनः। दं भासूयादि मुक्ताश्च परस्परहितैषिणः।।⁶⁸

They are devotees of cow, earth, and gods; they are absolutely truthful in speech, intent on being agreeable to others, and always contented in mind-

गोभूमीदेवभक्ताश्च नितरां सत्यवादिनः। पराकूल्यनिरताः सन्ततं तुष्टचेतसः।।⁶⁹

They are without any vices like drowsiness, idleness etc., devoid of excessive desire, anger etc. mutually friendly and are always ready to help-

तन्द्रालस्यादिहीनाश्च कामक्रोधादिवर्जिताः। परस्परं स्नेहभाजः साह्यकर्मरताश्च ये।।⁷⁰

Farmers are said to be excellent, of holy appearance, and are real protectors of water reservoirs, canals etc.-

ते तूत्तमाः समादिष्टाः पुरुषाः पुण्यदर्शनाः। जलाशयतटादीनां कुल्यादीनां च रक्षकाः।।⁷¹

Agricultural implements-

This aspect has been very well discussed in the book entitled 'History of Technology in India' published by Indian National Science Academy. The development of agriculture is reflected in the numbers of tools and implements fashioned by any community and their effectiveness. Of the different stages in cultivation the impact of implements is seen in the first and basic one, that is tillage. The *Vedic* literature mentions *abhri* as a digging tool. It was hollow and was a span or sometimes a cubit long. It was used both for leveling the land and for digging holes. Though generally translated as spade, some scholars suggest it to be a mattock and not real spade. *Vedic* hymns dedicated to *abhri* testify to the appreciation of its utility.

The *Vedic* terms for plough are *lāngala* and *sīra*. It was made of hard wood like *Khadira* and *Udumbara*. *Sīra* (plough) was *iṣā* (pole) with a *yuga* (yoke) attached at its upper side. The *R̥gvedic* plough is taken to be a simple and light implement made of wood. But the reference to its well smoothed handle and its sharp pointed share⁷² suggests that there was an effort to improve it to make it something of which the owner could feel proud. The *R̥gveda*⁷³ refers to six to twelve oxen being yoked to the plough. In the *Kāthakasaṃhitā*⁷⁴ the number goes up to twelve or even twenty four. The *Atharvaveda* also refers to ploughs drawn by six

⁶⁸ Ibid, 1/182

⁶⁹ Ibid, 1/183

⁷⁰ Ibid, 1/186

⁷¹ Ibid, 1/187

⁷² *Atharvaveda*-3/17/3

⁷³ *R̥gveda*- 6/91/1

⁷⁴ *Kāthakasaṃhitā*- 15/2

to eight oxen. This would suggest heavy ploughs required for breaking the hard soil. The *R̥gvedic mantra*⁷⁵ refers to the use of horses for ploughing. The application of horse power would also imply a heavy plough. There is ample literary evidence to indicate that ploughing had become the most important operation in tilling. *Pāṇini*⁷⁶ refers to the verb *halayati* meaning ‘uses the plough’. This is further indicated by the term ‘*lāṅgalagrāha*’ (one holding the plough) used by *Patañjali*⁷⁷ as referring to the cultivator.⁷⁸ The literary sources mention a number of tools used in digging. Besides *Khanitra*⁷⁹ and *Ākhana*⁸⁰ we have a special type of hoe called *stambaghna*⁸¹ which was used for weeding out the stumps. After ploughing the clods were broken and the fields were leveled with the help of spade or hoe. The *Amarkośa*⁸² implies that *loṣṭhabhedana* was a separate tool for breaking clods. *Patañjali*⁸³ informs that leveling of the field was done by a wooden log yoked by two oxen. The *Amarakośa*⁸⁴ gives a consolidated list terms for important parts of plough. They are *Yotra* (rope), *Nirīśa* or *Kuṭaka* (the part where ploughshare is attached to pole), *Phāla* or *Kṛṣika* (ploughshare), *Laṅgala* or *Hala* (plough) and *Īṣā* (pole).

The *Kṛṣiparāśara* gives a very detailed account of the different parts of plough. According to it the eight parts of a plow are i) *Īṣā*, the beam of the plow connected to yoke; ii) *Yuga*, the yoke to which the oxen are tied; iii) *Sthāṇu*, the wooden support of the plowshare; iv) *Niryola*, the rod joined to the beam and used to control the direction of the plow; v) *Niryolapāśikā*, the handle for the farmers’ grip on the plow; vi) *Aḍḍacalla*, wooden pegs fitted through holes on the yoke; vii) *Śaula*, the plowshare consisting of an iron blade which digs up mud; viii) *Paccanī*, the stick to drive the oxen. *Īṣā* is five hands in length (the length from elbow to the tip of the middle finger is one hand). *Sthāṇu* should be five *vitastis* (the length from the tip of the thumb to the tip of the little finger of an extended palm is one *vitasti*). *Niryola* should be one and a half hand while *Yuga* should be extended up to the ears of the oxen. *Niryolapāśikā* and *Aḍḍacalla* should each measure twelve *aṅgulas* (the breadth of a finger is one *aṅgula* and twelve *aṅgulas* make one *vitasti*). *Śaula* should be of an *aratni* measure (the distance between the elbow and the tip of the little finger is one *aratni*). *Paccanī* should be strong, made of bamboo, with iron-end and should measure twelve and half or nine ‘fists’. The circular *Ābaddha* (a disc-plow used on hard, virgin soil) should measure fifty four *aṅgulas* (in diameter); *Yotra* (the belt used round the neck of the ox) four hands and the rope (*Rajjū*) five. The *Phālaka* (plowshare) is stated to measure a ‘hand’ and four ‘fingers’ while

⁷⁵ *R̥gveda*-8/9/2,3, 5, 7

⁷⁶ *Aṣṭādhyāyī*-3/1/21

⁷⁷ *Aṣṭādhyāyī*-3/2/9

⁷⁸ *Bṛhat Saṃhitā*-4/9

⁷⁹ *Aṣṭādhyāyī* -3/2/184

⁸⁰ *Ibid*, 3/3/125

⁸¹ *Ibid*, 3/3/83

⁸² *Amarkośa*- 2/9/12

⁸³ *Aṣṭādhyāyī*- 1/4/49

⁸⁴ *Amarakośa*-2/9/13, 14



phalikā resembling a leaf of an *Arka* shrub should measure nine *aṅgulas*. A *Viddhaka* (It is a harrow that plows multiple rows. This is used for sowing seed in dry soil.) should have twenty-one spikes. A *Madikā* (It is a wooden plank fitted to the plow to level soil inundated with shallow water) measuring nine hands is recommended for several uses. This according to *Parāśara*, is the equipment of a plow. Farmers advised to make it sufficiently strong to be used fruitfully in the various activities of farming. Any implement which is not manufactured as per the above said measurements will, at time of farming operations, obstruct the work at every step. There should be no doubt about it-

ईषायुगहलस्थाणुर्नियोलस्तस्य पाशिका। अड्चल्लश्च शौलश्च पच्चनी च हलाष्टकम्।।

पच्चहस्ता भवेदीषा स्थाणुः पच्चवितस्तिकः। सार्धहस्तस्तु निर्योलो युगं कर्णसमानकम्।।

निर्योलः पाशिका अड्चल्लस्तथैव च। द्वादशाङ्गुलमानौ तु शौलोऽरत्निप्रमाणकः।।

सार्धद्वादशमुष्टिर्वा कार्या वा नवमुष्टिका। दृढा पच्चनिका ज्ञेया लौहाग्रा वंशसंभवा।।

आबद्धो मण्डलाकारश्चतुःपञ्चाशदङ्गुलः। योत्रं हस्तचतुष्कं स्यात् रज्जुः पच्चकरात्मिका।।

पञ्चाङ्गुल्यधिको हस्तो हस्तो वा फालकः स्मृतः। अर्कस्य पत्रसदृशी फालिका तु नवाङ्गुला।।

एकविंशतिशल्यस्तु विद्धकः परिकीर्तितः। नवहस्ता तु मदिका प्रशस्ता सर्वकर्मसु।।

इयं हि हलसामग्री पराशरमुनेर्मता। सुदृढा कृषकैः कार्या शुभदा सर्वकर्मसु।।

अदृढायुक्तमाना या सामग्री वाहनस्य च। विघ्नं पदे पदे कुर्यात्कर्षकाले न संशयः।।⁸⁵

The description of the plough and its parts in *Mānasāra*⁸⁶ is more graphic. The *Mahābhārata* (12/262/46) and *Manusmṛti*⁸⁷ describe a plough as consisting of an iron blade driven into a piece of wood. The plough was a mark of prosperity and a householder's position was determined in terms of the number of ploughs he owned. It was considered the most sacred and essential implement in agricultural operations. Kings like *Janaka* (of *Rāmāyaṇa*) ploughed the fields themselves. *Balarāma* (*Kṛṣṇa*'s brother) used to carry the plow on his shoulder and was known as *Haladhara*. It was believed to be highly meritorious to gift a plow. Stealing or misappropriating plows was heavily punishable and more so, if it was done in the season of plowing. The king was to determine the punishment after considering the time and compulsion of offence.

MANAGEMENT OF AGRICULTURE-

⁸⁵ *Kṛṣiparāśara*-112-120

⁸⁶ *Mānasāra*-5/56-57

⁸⁷ *Manusmṛti*-10/84



Farms yield gold if properly managed but lead to poverty if neglected-फलत्यवेक्षिता स्वर्ण
दैन्यं सैवानवेक्षिता।⁸⁸

Farms should never be left to the care of anyone other than oneself.⁸⁹ Only the capable, motivated by the welfare of people should undertake farming. An incapable farmer lands himself in poverty-

समर्थेन कृषिः कार्या लोकानां हितकामया। असमर्थो हि कृषको भिक्षां प्राप्नोति मानवः।।⁹⁰

An agriculturist who looks after the welfare of his cattle, visits his farms daily, has knowledge of the seasons, is careful about the seeds, and is industrious is rewarded with harvests of all kinds and never perishes-

गोहितः क्षेत्रकामी च कालज्ञो बीजतत्परः। वितन्द्रः सर्वशस्याढ्यः कृषको नावसीदति।।⁹¹

Possessed of the knowledge of the science of agriculture dealing with plantation of bush and trees, or assisted by those who are trained in such sciences, the Superintendent of Agriculture shall in time collect the seeds of all kinds of grains, fruits, vegetables, bulbous roots, roots, *pāllikya*, fibre-producing plants and cotton-

सीताध्यक्षः कृषितन्त्रशुल्बवृक्षायुर्वेदज्ञस्तज्ज्ञसखो वा सर्वधान्यपुष्पफलशाककन्दमूलवालिक्यक्षौमकार्पासबीजानि
यथाकालं गृह्णीयात्।⁹² The work of agriculture shall not suffer on account of any want of plough
and other necessary instruments. Nor shall be there any delay in procuring them the
assistance of blacksmiths, carpenters, borers, ropemakers, as well as those who catch snakes,
and similar persons-कषणयन्त्रोपकरणबलीवर्दैश्वेषामसङ्गं कारयेत्। कारुभिश्च
कर्मारकुट्टाकमेदकरज्जुवर्तकसर्पग्राहादिभिश्च।⁹³

In this way one can say that Sanskrit Literature is full of facts related to agriculture and its various aspects.

⁸⁸ *Kṛṣi Parāśara*-1/79

⁸⁹ *Ibid*, 1/80

⁹⁰ *Ibid*, 1/82

⁹¹ *Ibid*, 1/83

⁹² *Kauṭilya Arthaśāstra*-2/24/1

⁹³ *Ibid*, 2/24/3