

## Agriculture in Ancient Sanskrit Texts: Relevance in Modern Nepal

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### Abstract

*There are large numbers of ancient Sanskrit texts that include agricultural science in them. Manuscripts like Vedas, Krishi-Parashara, Kautilya's Arthashastra consist of valuable information about agronomy. Selections of seeds, land preparation, water management and irrigation, pest control, storage, crop rotation and so on are the topics described in them. There is a treasure of knowledge on agriculture in ancient Sanskrit text. Nepal, as an agricultural country, is lagging behind to fulfill the basic needs of general people along with economic depletion. Agro-economics can be benefited from the principles described in above mentioned ancient Sanskrit texts. Therefore, this paper seeks to preview a brief arm-chaired survey of our ancient literatures. The effort especially focuses on Vedas, Krishi-Parashara and Kautilya's Arthashastra with special reference to agriculture focusing relevance in contemporary Nepal.*

### Background

There are large numbers of ancient Sanskrit texts described about agricultural science. Vedas, Krishi-Parashara, Kautilya's Arthashastra, Patanjali's Mahabhasya, Varahmihira's Brhat Samhita, Surapala's Vrikshayurveda, Krishishasana, Kashyapiyakrishisukti, Vishvavallabha, Sushritasamhita are known as some of the valuable manuscripts. These manuscripts have already mentioned about know-how of ancient technology with regard to agronomy- selection of seeds, land preparation, pest control, storage, plant nutrients, grafting, soil selection, plant propagation, diseases and plant protection, crop rotation, intercropping and so on. There is a treasure of knowledge on agriculture in ancient Sanskrit texts at one extreme. Nepal, as an agricultural country, is lagging behind to fulfill the basic needs of general people along with economic depletion day by day.

Since Vedic age to present days, agriculture has been regarded as an important means for peoples' livelihood. In the developing countries like Nepal, it has been a community's socio-economic base and a nation's economic prosperity. In Nepal, out of the total households less than three-fourth (73.9%) are the owner of land (NLSS, 2011). The

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contribution of agriculture to GDP is 34.7 percent only (MoF, 2011). Agricultural production still remains erratic due to high dependency on monsoon as a result of lack of irrigation facilities. This situation has not only created food security problem but also deteriorated the country's economic development.

The nation has achieved average economic growth rate of 4 percent over a decade (MoF, 2011) while our both neighbors (India and China) have been successful in achieving high economic growth. In such circumstances, it is necessary to think of alternative theories that Nepal should adopt for the better agricultural development. Thus, this paper attempts to preview a brief survey of our ancient literatures. It tries to highlight on Vedas, Krishi-Parashara and Kautilya's Arthashastra with special reference to agriculture. At this attempt, the article will first look into three different ancient Sanskrit texts in general and their contemporary relevance in Nepal.

### **Agriculture in Vedas**

The Vedas, world's oldest scriptures, form a rich body of traditional ecological and agricultural knowledge. Composition of hymns in Vedas reveals the reverence, respect and admiration of Vedic people towards the nature. The Vedas represent the grandest homage ever rendered to the environment. It is interesting to note that agriculture in Vedic period was regarded as the most honorable human activities. According to the Atharva Veda, farmer is an authoritative in the knowledge and acquirement of food, and is therefore highly respected. The common people choose their king from amongst the agriculturists. Everyone must farm their lands and cultivate nutritious crops. The profession is compared with the divine cow fulfilling all desires of the hard working farmers.

There are two famous collections of Vedic hymns: The Anna Sukta (Food Hymns) and the Bhoomi Sukta (Earth Hymns). In the Anna Sukta, food is equated to God. Great emphasis is laid on growing food in plenty and sharing it. In the Bhoomi Sukta, Prithvi (Earth), the divine mother is worshiped by her son i.e. the farmer. She is worshiped because she sustains as well as nurtures all plants and animals. While cultivating, she provides all necessities of life. Divinizing Mother Earth ensures that man lives in partnership with nature rather than exploit it. Thus, nature friendly farming systems and practices are suggested in both Suktas.

Although rainwater is ardently prayed for, but other sources of water were also identified and utilized in Vedas. Pastures for the cattle, food for living beings, water for drinking purpose and irrigation: everything depended on water. Rain fall and irrigation for food grains result in growth of medicinal plants protecting human beings and animals from diseases (Rigveda 3-56-4).

Irrigation from never-drying pits (shallow wells) and canals drawn from rivers is suggested in Rigveda. There is a reference to kulya, the ducts or vessels for carrying water. In Atharvaveda, a better and more objective understanding of the phenomenon of rain and other natural forces is noticed. Five sources of water are mentioned therein:

desert (occasional showers), ponds, wells, pots, and seasonal rains. The rainwater was typically suggested for harvesting. (Sadhale, 2006). Besides those, many more illustrations and suggestions are found in Vedas for the development of agriculture.

### Agriculture in Krishi-Parashara

The text of Krishi-Parashara consists of two hundred and forty-three verses. The text is mostly composed in the popular anustuph (Chhanda) by the Great Sage Parashara. The book is written for the welfare of the farmers. Thus, it is the theory of agriculture expounded in such a manner that the farmers would benefit by its application to their profession. (Battu, 2009). Parashara has given very much emphasis on agriculture depicted in the following verse:

*Subarna roudya manikya sanairapi puritaa  
Tathapi prarthayantyeba krishkaan bhakta trishnayaa. (1.4)*

It is clear from the above verse that even though the rich or poor may accumulate wealth in terms of gold, silver, jewels or costly clothes – these people are yet dependent on a farmer in order to feed their hungry stomachs. These people still keep a lookout for a farmer for regular supply of grains and farm products. In another verse, Parashara focused upon the rain for cultivation as:

*Bristi mula krishi: sarvaa bristi mula cha jibanam  
Tasma daadau prayatnena bristi gyanam sama charet. (1.10)*

It means all type of agriculture is dependent on rains or rain bearing clouds. Hence it is important to all farmers to analyze all omens, astrological combinations, mathematics to judge what amount of rainfall will be available for agriculture. Farmers are advised by the sage to observe the monthly rainfall beginning with Paush (December - January). Parashara stresses to know the quantum of monthly rainfall. The observer of the weather has to work every day and keep track of the direction of winds by fixing a rod with a flag attached to it. According to Parashara, wind from the north or the west brings rain while from the east or the south indicates absence of rain. Parashara further defines the rainfall pattern of various clouds as:

*Ekdeshena chabarta: sambarta: sarbato jalam  
Puskare duskaram wari drone bahujala mahi. (3.25)*

This verse states that Aavarta clouds shed rain in small areas at random, which means most part of the land receives no rain or very little rain while Samvarta clouds shed rain on entire land. Pushkara clouds shed rain falls in very little quantities while Drona clouds shed rain in excessive quantities. Sage Parashara has suggested techniques of guessing the recurrent rainfall on the several bases of yearly prediction for crop production yield. For this purpose, an astrologer must calculate the King amongst planets for the coming year.

This is usually done when the year changes by Shaka Samvat. In one verse Parashara further says:

*Chitta larke nripe bristirbristi rugra nisha patau  
Bristir manda sada bhaume chandraje bristir uttama. (2.13)*

If Sun is the King of the year, farmers should expect average rainfall. If Moon becomes King, then one should expect bountiful rainfall. If Mars becomes King, very little rain is expected. If Mercury becomes King, one should expect excellent rainfall. In this way Parashara provides the knowledge of astrology that the farmers can use for better cultivation.

Similarly, avoiding overwork for the cattle, ensuring proper hygienic conditions in the cowsheds, construction of cow sheds, useful nourishment for the cattle, disposal of the cow dung, the number of bulls to be yoked to a plow, branding of cows with hot iron, and long-distance movements of cattle are some of the topics discussed in the section called 'vahanavidhana' where the subject of cattle care is dealt with methodically.

According to Parashara, the seed has to be dried well, cleaned from weed seeds, and kept securely in small pouches. Emphasis on uniformity of seed clearly points to the existing knowledge that varietal characteristics are inherited and the desired traits in grain can be obtained through visibly similar seeds. Storing seeds in secure places ensure that these remain viable till the next season is clearly indicated. 'The origin of plentiful yield is the seed' makes very good sense and reveals an excellent understanding about the importance of good seed. (Nene, 2009).

In the Krishi-Parashara, basic rules for general management of agriculture are eloquently expressed. Detailed instructions to farmers regarding procuring and preserving seeds, plowing, sowing, water management, weeding, plant protection, harvesting, threshing, measuring food grains and storing them are given in a scheduled form along with precautions to be taken from time to time. Knowledge of climatic conditions largely dependent on astronomical theories, vigilance, hard work, and love for the agricultural profession are stated to be the essential qualities of a successful farmer. (Sadhale, 1999). In this way the detailed description of agricultural implements, especially the plough, along with measurements of the various parts is a noteworthy feature of the text.

### **Agriculture in Kautilya's Arthashastra**

Kautilya's Arthashastra is a famous ancient Sanskrit text composed in around 300 B.C. The author, Kautilya (also known as Chanakya and Vishnugupta) was a great Brahmin scholar and a teacher of statecraft, which, in those days embraced economics, politics, war science, espionage and various aspects of religious and social life (Shah, 2002). The entire text of Arthashastra is divided into fifteen books, each containing several chapters. Chapter 24 in book 2 is entitled Sitadhyaksha or The Superintendent of Agriculture (for crown lands). This chapter contains information relating to farmers in general as it is

meant to inform as well as to advise the superintendent with regard to increasing the production on the lands owned by the crown.

Kautilya opined that cultivable land is better than mines because mines fill only the treasury while agricultural production fills both treasury and store houses. The Arthashastra stated about the functions of a Superintendent of Agriculture. Besides, the king should understand the intricacies of agriculture (IMC, 2004). In the first verse of the chapter Sitadhyaksha, Kautilya says:

*Sitadhyacha: krishitantra shulba vrichh ayurved agastajyasakho wa sarva dhanya  
pushpa phala  
shaka kandamula wallikya chauma kparasa bijani yatha kalam grihniyat. (2.24.1)*

According to this verse, those who possess knowledge of agronomy, water management or they assist, who are trained, in such sciences. They are superintendents of agriculture. They will in time harvest crops of all kinds namely flowers, fruits, vegetables, bulbous roots, roots, fruits of creepers, fiber-producing plants such as hibiscus and cotton. At the same time, Kautilya suggests strongly the Superintendent of Agriculture about his duties while harvesting crops accordingly.

Astrology and meteorological aspects of agriculture have been focused by Kautilya because agriculture in those days mostly depends upon rainwater. Thus, in the next verse he says:

*Shodasha dronam jangalanam barsha praman madhya ardha manupanam  
deshwa panam ardha trayodash ashmaka namam  
trayobimsha tirabanti nam amit amaranta nam  
haima nyancha kulyawa panancha kalata. (2.24.5)*

It means, the quantity of rain that falls in the country of jangala (desert countries) is 16 dronas (Drona is a measuring unit for rain fall in ancient time. Where, 1 drona = 511 cubic inches) (Olivelle, 2013); half as much more in moist countries, the countries which are fit for agriculture; 13½ dronas in the country of asmakas (Maharashtra); 23 dronas in Avanti (Madhya Pradesh); and an immense quantity in aparantanam (western countries), the borders of the himalayas, and the countries where water channels are made to use in agriculture. As the rainfall is not the same (high or low), the superintendent will sow the seeds, which is suitable for that level of rainfall. For this purpose, Kautilya has given more information along with the nature of rainfall as:

*Traya: saptahika megha ashiti: kana shikara:  
khasti ratapa meghana mesha bristi: samahita. (2.24.9)*

*Bata mata payogancha bibhajan yatra barshati  
trin karsha kanshcha jana yanstatra sasyagamo dhurba: (2.24.10)*

It is better if rain occurs three times throughout seven days continuously. Similarly, it is also considered better if rain occurs eighty times with minute drops in a whole rainy season. Above all, if rain occurs sixty times with the sunshine timely wise, it is far better for the cultivation. Where there is the rain falls free from wind and unmingled with sunshine so as to render three turns of ploughing possible. As a result, there is certainly the reaping of a good harvest.

Kautilya also informed in his Arthashastra that the varieties of seeds may be sown according to the changes of the season as:

*Shali brihi kodra ba tila priyangu daraka varaka: purbawapa:*

*mudga masha shaimbya madhyawapa:*

*kushumbha masur kulattha yawa godhuma kalay atasi sarshapa: pashchadwapa:*  
(2.24.12)

Sali (rice), vrihi (wheat-barley), kodrava (*Paspalum Scrobiculatum*), tila (sesamum), priyangu (panic seeds), daraka, and varaka (*Phaseolus Trilobus*) are to be sown at the commencement of the rainy season. Mudga (*Phaseolus Mungo*), masha (*Phaseolus Radiatus*), and saimbya are to be sown in the middle of the season. Kusumbha (safflower), masura (*Ervum Hirsutum*), kuluttha (*Dolichos Uniflorus*), yawa (barley), godhuma (wheat), kalaya (leguminus seeds), atasi (linseed), and sarshapa (mustard) are to be sown last.

According to Kautilya, the fertile land left barren may be brought under cultivation by employing on the basis of half share of crop yield. In other words, those who cultivate for land owner would in return get half share of the production. In short, live by own physical exertion. (2.24.14). Such a scientific idea will increase the agricultural yields by cultivating barren lands too.

In Arthashastra, a category of the vegetation has been also found to help farmers grow the suitable crops to choose on. It is mentioned that rice-crops and other similar crops are the best to grow where there are vegetables of intermediate nature, and sugarcane is very difficult to grow up. They are subject to various evils and require much care and expenditure to reap. (2.24.18). Similarly, the better use of the land available on river bank also suggested by Kautilya. The lands beaten by foam (banks of rivers, etc.) are suitable for growing pumpkin, gourd and other similar products as well. The lands are frequently overflowed by water useful for long pepper, grapes, and sugarcane. The vicinity of wells is useful for vegetables and roots and low grounds for green crops. Marginal furrows between any two rows of crops are suitable for the plantation of fragrant plants, medicinal herbs, cascus roots, hira, beraka, and pindaluka (lac) and the like. (2.24.19)

Another important fact that Kautilya tells in his Arthashastra is of seed management. The seeds of grains are to be exposed to mist and heat for seven nights. The seeds of kosi are treated for three nights, the seeds of sugarcane and the like are plastered at the cut

end with the mixture of honey, extracted butter, the fat of pigs, and cow dung; the seeds of bulbous roots with honey and extracted butter; cotton seeds with cow-dung; and water pits at the root of trees are to be burnt and manured with the bones and dung of cows on proper occasions. (2.24.19). This noticeable idea helps farmers how to treat with seeds for its abundant yield.

Kautilya has given many more scientific ideas in his text Arthashastra. These ideas are not only related with land management, irrigation, and seed management. Further, He has suggested about pre-cultivation and post-harvesting. Grains and other crops will be collected as often as they are harvested. Crops, when reaped, shall be heaped up in high piles or in the form of turrets. The piles of crops shall not be kept close, nor shall their tops be small or low. The threshing floors of different fields shall be situated close to each other. Workmen in the fields shall always have water but no fire. (Shamasastri, 1967). It is thus, a great science of agriculture from oriental scholar which has a bunch of treasure within it.

### **Relevance in Contemporary Nepal**

From the study above, it can be clearly stated that there are numbers of valuable information about agro-economics depicted in the ancient Sanskrit texts. They were very much suitable for ancient period and also keep values in present day's agriculture. Some of the topics that have contemporary relevance in Nepal are excreted here for example under the following headings.

#### ***Sustainable Development***

Man should live in partnership with nature rather than exploit it (Atharva Veda). The same theme is found on the concept of sustainable development today. Due to the rapid population growth, environmental degradation is becoming a serious problem in Nepal. Marginal lands are being cultivated to fulfill the demand of food for growing population. It should not be destroyed the natural resources in the name of development activities and cultivation too. This is why, nature friendly farming systems and practices are suggested in Anna Sukta and Bhoomi Sukta of Atharva Veda which is the prime slogan of every developmental institution today.

Kautilya also attaches extreme importance to the preservation of forests and other natural resources. He prescribes that appropriate plants should be grown to protect dry lands and pasturelands should be properly protected. Kautilya prescribes that everyone should be careful about preserving common property and bio-diversity, otherwise he would be fined. (Basu, 2011). All these ideas can be taken for the implementation of the concept of sustainable development in Nepal.

#### ***Land Management***

Land is an important source and a factor of production. It is limited in nature. So, it should be used properly. But land fragmentation for the commercial purpose is increasing

in the alarming rate. People are being short sighted and looking forward to earning money by transforming fertile land to place for the purpose of housing and industrializing. Nepal cannot be left untouched by same problem. The state can take some better ideas to solve this problem from Kautilya's Arthashastra. Kautilya has focused on its importance as cultivable land is better than mines because mines fill only the treasury while agricultural production fills both treasury and store houses. Therefore, land should be managed properly.

Similarly, the problem of income inequality is also a serious problem in Nepal. One of the reasons is unscientific distribution of available land among the people. Limited rich people have too much land whereas a mass of poor people have a limited land resulting in vast economic disparity between haves and have not. The facts show that 'small' farmers operate only 18 percent of total agricultural land while 22 percent of the land is operated by 'large' farmers. Gini concentration index is estimated at 0.51. (NLSS, 2011). This indicates an unequal distribution of land in the country. The index is zero when all farmers have the same area. Moreover, 'large' farmers do not cultivate all the land they have. If the state applies the ideas from Kautilya that left uncultivated land must be brought under cultivation, such problem may be reduced to some extent. According to Kautilya, if any person leaves land given to him uncultivated, the state should promptly seize it and hand it over to some diligent cultivator. Also these persons are to pay compensations for keeping land idle. This is a strong measure to discourage misuse of land resources of the country.

### *Water Management and Irrigation*

Nepal is known well as the second richest country across the world for water sources though there is lack of irrigation facilities for cultivable land. There are six thousands river and rivulets in Nepal, but has not been yet managed well for irrigation. The overall share of irrigated land area in total agricultural land area is 54 percent in the country. (NLSS, 2011).

In the Rigveda, irrigation from never-drying pits and canals drawn from rivers is suggested. There is a reference to kulya, the ducts or vessels for carrying water in Rigveda depicts the vedic people were more serious to the management of irrigation for better crops. Five sources of water are also mentioned in Atharva Veda. The suggestion is therein of rainwater for harvesting. Thus, from ancient Sanskrit text, Nepal can take many more ideas for water management.

Kautilya also prescribes measures for irrigation facilities which are essential for development of agriculture. As like today, in those days; too, rainfall was not regular and equally distributed over all regions of the country. Agricultural pursuits in the dry and drought-prone areas were dependent solely on irrigation water. In other areas too, irrigation was required during dry seasons, and years of scanty rainfall because of climatic irregularities. For these reasons Kautilya suggests construction of water reservoirs, wells, tanks, fountains etc. Trees should be planted for soil and water



conservation, especially in dry areas. In this regard, the state should also seek people's participation. People undertaking these activities should be encouraged by the state in various ways.

### *Astrology and Metrological Knowledge*

Nepalese agriculture is heavily dependent upon rain water in the absence of irrigation facilities. Sage Parashara has suggested guessing methodology of rainfall throughout a year for better crop production. Parashar, in his text *Krishi-Parashara*, has strongly recommended the knowledge of astrology that farmers can adopt for better cultivation. Nepalese farmers should be given the knowledge of such astrology recommended as in *Krishi-Parashar*.

There is great importance of astrological and metrological knowledge among the farmers where there are poor facilities of irrigation. Kautilya, thus, informed various things about astrological and metrological aspects. Kautilya's *Arthashastra* is rich in astrological and metrological knowledge and it provides the general rules of rain which is very useful for the farmers to predict the rainfall throughout the year. Such knowledge is more important in the country like Nepal as the metrological department only predicts the short range prediction of about two or three days.

### *Seed Management*

Nepali farmers are always in the quest of proper seed for better production but their demand for seed is fulfilled by so called imported improved variety. The seed is prepared not by organic but by inorganic procedure. It is sometimes found that there is no grain inside the cultivated crops, too. In such circumstances, Kautilya's *Arthashastra* helps farmers to choose right crops to grow up. Superintendent of Agriculture strongly has been suggested about his duties for collection of seeds according to seasons in *Arthashastra*. Whether the rainfall is more or less, the superintendent sows seeds. The seeds require either more or less water. The varieties of seeds may be sown according to the changes of the season.

Likewise, *Arthashastra* states about the method of treatment of seeds before sowing them. In his *Arthashastra*, Kautilya classified the seeds, shows the way of preparation of seed and treatment after germination too. All these ideas are very beneficial to the farmers in Nepal in recent days.

### *Post Harvesting or Storage*

In Nepal, more and more farmers have suffered by damage of their crops after harvesting due to the calamities like fire-setting. Preservation of grain from insect and mouse is also becoming a serious problem among the Nepalese farmers. Kautilya's *Arthashastra* has also given post-harvesting ideas, too. It is suggested that the threshing floors of different fields shall be situated close to each other and workmen in the fields always have water but no fire. It is all for safety of storage stuff. Kautilya has given

various ideas upon the activities that the farmers should be considered after cultivation, which are applicable in present days farming in Nepal.

### Conclusion

Nepal, as a developing country, is facing various problems in agriculture development. Farm sizes are small here. Land is fragmented and there is lack of land management. Reliable irrigation facility is also not available. Farmers incur higher cost of production as a result, products are not competitive in national and international markets. Similarly, basic modern technology inputs like seeds, fertilizer, breeds and feeds are in short supply. Production systems are still subsistence based and not yet market oriented. There is lack of proper management of environmental resources and so on. To overcome with all these problems, the ancient Sanskrit texts would be most helpful. Many recommendations were made in texts such as Vedas, Krishi-Parashara, Kautilya's Arthashastra, etc. to increase agricultural yield, land management, water management, and seed management, and so on. Thus, here is an urgent need to rediscover agricultural knowledge based on ancient Sanskrit texts. Agro-economics can be benefited from the principles described in the ancient Sanskrit texts which is underlying on sustainable agriculture. Thus, it is up to present-day farm scientists to study recommendations of the past and practice them, if found valid.

### References

- Basu, R. L. (2011). *Kautilya's arthashastra*. Retrived from [www.smashwords.com](http://www.smashwords.com)
- Battu, V. (Trans.) (2009). *Krushi-Parashraha-1 by Sage Parasara*. Retrived from [www.saptarishiastrlogy.com](http://www.saptarishiastrlogy.com)
- CBS (Central Bureau of Statistics) (2011). *Nepal living standard survey (NLSS) 2010-11*. Kathmandu: CBS.
- IMC (Indian Merchants' Chamber) (2004). *Summary on Kautilya's arthashastra: Its contemporary relevance*. Mumbai: IMC.
- MOF (Ministry of Finance) (2011). *Economic survey*. Kathmandu: MOF.
- Nene, Y. L. (2009). *Indigenous knowledge and practices: Some classics on agriculture*. New Delhi: Fourth World Congress on Conservation Agriculture.
- Olivelle, P. (2013). *King, governance, and law in ancient India: Kautilya's Arthashastra*. New York: Oxford University Press.
- Sadhale, N. (Trans.) (1999). *Krishi-parashara (Agriculture by Parashara)*. of Asian Agri-History, 2.
- Sadhale, N. (2006). Water harvesting and conservation in ancient agriculture texts. *Asian Agri-History*, 10(2), 105-120.
- Shah, M. (2002). Agricultural science in Kautilya's arthashastra (Commentary), *Asian Agri-History*, 6(3), 231-242.
- Shamasastri, R. (Trans.) 1967). *Kautilya's Arthashastra* (Eighth edition). India: Mysore Printing and Publishing House, Mysore.