Anthropology
ISSN: 2332-0915

Ho and Gamarra, Anthropol 2018, 6:2
DOI: 10.4172/2332-0915.1000202

Review Article Open Access

A Story of Globally Important Agricultural Wisdom in the 15th Century Chosŏn Korea

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Abstract

The Korean peninsula stretches from 34 to 42 degrees north latitude, with most mountainous land of the peninsula in a north-south orientation, the climate variance is extreme. The north experiences cold, dry winters, blasted by Siberian winds, while the south has mild, wet winters and hot, humid summers drenched by summer typhoons. The seasoned farmers of Korea adapted well to these bad conditions and achieved high levels of production. However, modernization from the twentieth century ignored traditional farming especially upland farming, only focused on the irrigated lowland, often overlooked seasoned farmers experience from Northern Part of Korea is the importance of hybrid dry field farming and wet field farming with their ability to escape droughts, avoid floods, and in mountainous localities. The Korean agricultural writing in the fifteenth century known as Nongsa chiksŏl, in English "Concise Farming Talks" tell us a seasoned farmers story which is upland farming is the great foundation of the mountainous states under Heaven for sustainable development

Keywords: Hybrid; Dry field farming; Wet field farming; Droughts; Floods; Agricultural Heritage; Chosŏn dynasty

Introduction

The indigenous agricultural systems of the world have been built on local knowledge and experiences that reflect the evolution of human kind, the diversity of its knowledge, and its profound relationships with nature. These systems have resulted not only in outstanding landscapes, maintenance and the adoption of agricultural variability, indigenous knowledge systems and resilient ecosystems, but also food and livelihood security for millions of poor and small farmers in a sustainable manner.

Globally Important Agricultural Heritage Systems are defined as "Remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development" (FAO 2002). The Korean peninsula is mountainous and stretches from 34 to 42 degrees north latitude, with most of the peninsula in a north-south orientation, the climate variance is extreme. The north experiences cold, dry winters, blasted by Siberian winds, while the south has mild, wet winters and hot, humid summers drenched by summer typhoons. These variable conditions north to south present great difficulties for developing the food cereal crop, especially rice. Furthermore, North Korea's high altitude and steep slopes like Switzerland make a large part of its territory virtually unusable for agricultural purposes, with only limited possibilities, compared to Southern part of Korea.

To meet with challenge of producing more rice from the mountainous resources, therefore traditional seasoned farmers experiences are required, how to achieve high level of production there is need to know water, temperature, photoperiod regulate in rice which is the key success to a high potential yields. The *Chosŏn* Dynasty, the government led the establishment of an agricultural knowledge system and published many books in cooperation with the seasoned farmer. Among many books, in particular, two books on agriculture were published in 15th century. One is known as *Nongsa chiksŏl*, (農事直說) in English "Concise Farming Talks" (hereafter CFT), is a compilation ordered by King Sejong (r 1418-1450) in 1429.

He declared 'Farming is the great foundation of all states under Heaven' and published the inventiveness and ingenuity of seasoned farmers in their use and management of ecosystem dynamics, and codified their knowledge, practices and technologies which is a useful source could be answered and put to use in combination with modern agriculture to make the most of the resources that can be found in Korea. CFT compiled their wisdom for the classification of all the various crops by form and shape, the suitable time for planting early or late varieties, and the proper order of what must be first or last -- it gained in-depth access to all these principles without anything being left out, making this truly a compass for farmers.

CFT also informed the global similarities with mountainous India, Vietnam, Laos and Andean regions where the Inca Empire flourished, when trying to make the most of the diversity of geography and topography, subsisting and living in harmony with their natural environments. Although the widespread use of machinery and industrial agriculture date only from the 1960s, CFT still has a potential knowledge power for Korean agriculture adapted well to these conditions and achieved high levels of production.

Why in the fifteenth century then did the royal court of *Chosŏn* Dynasty embark on this national project? Why did King *Sejong* take initiative by himself to publish and disseminate "CFT" nationwide? To answer these questions, let's turn our eyes to the research on the climate history of the Eurasian world and the situation in a neighboring country, Japan. For about fifty years from the mid-14th to the early 15th century, East Asia saw the Korean Koryŏ Dynasty (918-1392) replaced by the Chosŏn (1392-1910) and, in mainland China, saw the transition

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Received: October 03, 2017; **Accepted** May 23, 2018; **Published** May 29, 2018

Citation: Ho JS, Gamarra ER (2018) A Story of Globally Important Agricultural Wisdom in the 15th Century Chosŏn Korea. Anthropol 6: 202. doi:10.4172/2332-0915.1000202

from the Yuan (1271-1368) nomadic empire to the Ming (1368-1644) agricultural empire. The great wave of change also washed over agricultural history. During this initial period of King Sejong's reign, the country suffered extreme starvation due to droughts for seven years in a row. In 1419 the terrible droughts caused as many as 140,000 people to starve in Ch'ungchŏng province and 12,223 in Hamgyŏng Province.

Literature Review

Scientists for global climate change actively work to understand Earth's past and future climate by using observations like growth rings of old trees, the rocks made by volcanic activities and earth surface temperatures to study climate history. Their research gave us a glimpse into the climate changes that spanned 11th through 21st centuries. According to the research on climate changes over a thousand years, the 15th century when *"CFT"* were published recorded the lowest summer temperatures. This globally coincides with the darkest times in the late Middle Ages of Europe from the14th through the 15th century, characterized by the Black Death (1346-1671) and the war such as Hundred Years' War (1337-1453), and Wars of the Roses (1455-1485).

Turing to a neighboring country, Japan named the historical period from 1336 to 1573 the *Muromachi* era. The 15th century of Japan, right in the middle of *Muromachi* era, was known for its highest frequency of famine in the 1,000 year period from the 10th to the 20th centuries. The 15th century of Japan show us the comparison between temperature and historical events demonstrates that abrupt cooling after 10-20 years of long warmth often caused famines characterized by unprecedented numbers of deaths, suffered from the Kansho famine (1459-1460), which led to the Onin war (1467-1477), the destruction of the capital city Kyoto, which lastly led to Japan becoming an aggregate of warring states. Overall, multi-decadal temperature variability from the 12-15th centuries appears to have resulted in many serious societal disturbances [1] According to the same research, pests affected the countries in central Asia and Europe starting from the mid-to-late 14th century, peaked in the 15th century and started to decline by the 17th century. The disease was behind a sharp population [2] decline in the regions.

The period from the enthronement of King Sejong to the publication of *CFT* marked the lowest recorded summer temperatures. Just before publishing *CFT*, the abnormal summer temperatures in a series from 1417 to 1426 resulted in poor harvests across the nation, causing famines. Figure 1 shows the number of recorded natural disasters such as droughts, floods, winds, the damage caused by harmful insects and famines that occurred during the Chosŏn Dynasty. It reported a total of 1,794 cases during King Sejong's reign and 1,542 cases during King *Sŏngchong* reign from 1462 to 1495. *CFT* bear significant implications of what happens when the most severe natural disasters affected countries around the world.

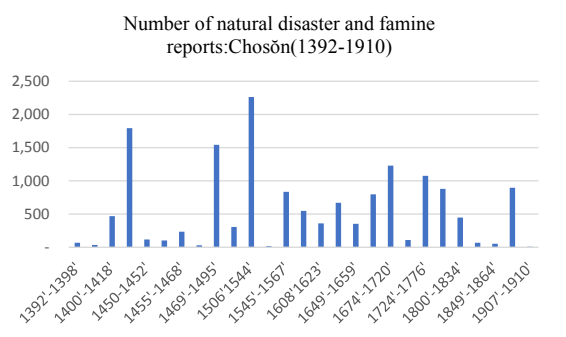

Figure 1: Number of natural disaster and famine reports: *Chosŏn* (1392-1910).

With the climatic shock, the court of the Chosŏn Dynasty started to import farming books from China. King T'ae Chong (r 1400-1418) conducted a project to spread the farming books imported from China. Moving beyond importing and mimicking the Chinese farming techniques [3], King Sejong (r 1418-1450) explored local farming techniques adequate to local soils under drought climate conditions and farming cycles different from their Chinese counterparts. He ordered a compilation of farming information into a book and printed these books to provide for all provinces across the country. The printing of books to disseminate useful information was rare in other parts of the world in the 15th century. Central Asia and Europe saw the rapid decline in population due to epidemics [4], war and famine during the 15th century. Japan, like Europe, underwent a period of constant warfare and death. In the 15th century Korea, records of natural disasters such as droughts, floods, wind damage, damage by blight and effects from harmful insects reached their historic peaks. It is worth noting again that Chosŏn did not just muddle through this age of epidemic, famine, and war, but rose to the challenge through the compilation and dissemination of agricultural science books, that is CFT.

The significance of the publication CFT can be regarded as part of the renaissance of the 15th century in global society. CFT was not only used continuously as the basic instruction manual for state agricultural policy during the over five hundred year-long Chosŏn dynasty, but also became the basis in the compilation of agricultural texts for civil scholars throughout the late Chosŏn dynasty after the Imjin War (1592-1598). As an instruction manual based on wet-field and dry-field farming techniques [5], CFT is intimately linked with the state agricultural policy of the Chosŏn dynasty. This link can be found in the fact that the arable land of the 336 counties and districts of the eight provinces of the 15th century Chosŏn were classified into wet fields and dry fields, the scales and proportions of which were surveyed and recorded in the Geographical Appendix of the Veritable Records of King Sejong (Sejong sillok chiriji,世宗實錄地理志 in 1454) (hereafter GAVK).

Along with ordering the compilation of CFT, King Sejong classified the arable land of the country into proportions suitable for wet field and dry field farming by counties and districts and created statistical data of this information. The data of numbers of households per county and district and the area of arable land from GAVK has been worked into the irrigated lowland (southern Korea seaside-land), non-stressed upland (Southern Korea inland), moderately stressed upland (middle part of Korea), severely water-stressed upland (Northern part Korea). In the case of Hamgyŏng Province, North Korea which had the lowest proportion of wet fields, the average proportions of wet fields and dry fields over its twenty-two counties and districts was 4.35% and 95.65%, respectively. In the case of Chŏlla Province, South Korea which had the highest proportion of wet fields, the average proportions of wet fields and dry fields over its fifty-six counties and districts was 45.96% and 55.04%, respectively. The proportion of dry fields is still quite high. In light of these geographical conditions, the core techniques in CFT are hybrid between wet field farming and dry field farming techniques. As seen from the statistical data based off of GAVK, the distribution of dry fields composes the majority of Chosŏn's land area, and thus the intensive farming techniques based primarily on dry fields and multi-cropping system in CFT demonstrate that it is the premier farming text of the fifteenth century. CFT introduce upland-adapted approach to increasing productivity and reducing risk in southern Korea rainfed rice systems. CFT shift national gravity for tax from transplanting irrigated systems Southern part of Korea to direct seeding in non-puddled, non-flooded fields of North Korea can reduce water requirements for rice production.

The organization of CFT and the dry rice farming method

The publication of CFT is an important milestone in strengthening the new state based on farming households during the fifteenth century Korea. CFT emphasizes long-term environmental and social sustainability, which means the management of soil, water, and biological resources so that rural peoples can also use those resources. To be socially sustainable, farming must improve nutrition and income in ways that are prosperous and encourage local self-reliance and a rational distribution of resources. This means farming that uses local resources available to all households; these resources include indigenous farming techniques, and other indigenous crops.

Rice ecosystems are usually classified into four types: irrigated, rainfed lowland, deep water and rainfed upland. Irrigated rice is the most widespread ecosystem. It is also the most productive system. This can partly be explained by the reality that irrigated rice production generally takes place on well drained, fertile soils that are not subject to drought or flooding, but CFT tell us a different story. Classified into six types added two types with general classified: those two things are irrigated upland and hybrid dry farming and wet farming for rice. Here we will introduce only focused on the dry farming system.

A Concise Theory of Farming ("CTF") comprises ten chapters and one appendix as follows:

1. Preparing Grain Seeds, 2. Plowing, 3. Planting and Cultivating Hemp, 4. Planting and Cultivating Rice, 5. Planting and Cultivating Glutinous and Foxtail Millet, 6. Planting and Cultivating Glutinous Millet, 7. Planting and Cultivating Soy Beans, Red Beans, and Mung Beans, 8. Planting and Cultivating Barley or Wheat, 9. Planting and Cultivating Sesame, 10. Planting and Cultivating Buckwheat. The Appendix is titled: *A Concise Farming Theory of Glossary.*

The chapter 4 of CFT give us informed text for the origin of cultivated mountainous rice. The arable land of North Korea is the unflooded fields, where soil conditions in the root zone remain aerobic through most of the planting and growing season. North Korean seasoned farmers traditionally developed the techniques of upland rice cultivation which are sown without irrigation in unsaturated soils, they are considered to be drought tolerant. Their methods combine some of the yield potential-enhancing traits of lowland during the heavy rains in the rainy season the seventh lunar month with adaptation to aerobic soils [6]

The chapter 4 of CFT introduce three method for rice cultivation and planting, one is wet farming known by seasoned farmers as *mulsari*, the meaning of *mul* is water, sari is make soil evenly. Second is dry farming known by seasoned farmers as *gŏnsari*, the meaning of *gŏn* is dry and last is transplanting known locally as *myojong.* If a drought occurs in spring, wet farming and seedling transplanting is impossible, which have to take the chapter 4 of CFT known by seasoned farmers as *gŏnsari* which is sown with dry-farming techniques with adaptation to aerobic soils and raised with wet-farming techniques.

These so-called 'dry rice' (kŏndo, 乾稻) which were grown in the provinces now-a-days around Pyŏngyang North Korea Capital where dry lands were much more abundant than wet lands, which were sown with dry-farming techniques and raised with wet-farming techniques, and could be used with whatever technique was appropriate to the climate. As rain usually did not fall during the spring season especially first ten to twenty days of the fifth lunar month throughout the Korean peninsula when planting rice, it is believed that this type of 'dry rice' was developed in P'yŏngan Province by making aerobic soils and by direct sowing them in dry fields, which were then transferred to paddies during the heavy rains in the rainy season the seventh lunar month.

Upland rice cultivation in CFT is most evident in the case of the high praise for the 'dry rice farming method' (乾稻栽培法) of P'yŏngan Province North Korea and the 'three crops in two years method' in Hwanghae Province as cutting edge farming techniques. A seasoned farmer in North Korea discovered that the techniques lay in CFT, which were core techniques also mentioned alongside with double-cropping. The important information what they provided for dry farming *gŏnsari* is making fertilizer on seed mixed urine with ash. For fertilizer on seed first make a small pool outside the cattle shed to store (cow) urine. And grain-stalks, chaff, and the like are burned to make ashes, which are used for mixing evenly into the pool of deposited urine. With one's feet, stamp depressions into the ground and plant the seeds, driving away the birds until the seedlings are done growing.

The '*gŏnsari*' was especially difficult to pull off as there was a drought period of approximately sixty to seventy days from the fifth to seventh lunar months despite sowing barley which naturally demanded water in order to grow. In addition, another point worthy of attention is the fact that the farming implements used for this technique *gŏnsari* were made of wood and small in size which soil conditions in the root zone help keeping aerobic soil condition through most of the plowing and sowing season. Sowing without irrigation in aerobic unsaturated soils, they are considered to be drought tolerant with fertilizer on seed mixed urine with ash. Intensification of management of these systems make a competition with weed and prone to lodging when grown under conditions of favorable drought with high-soil fertility.

Dry farming *gŏnsari* also introduce very unique planting method which is Chockchong (足種) making a depression in the soil with farmer's left heel, throw the seed with fertilizer on seed mixed urine with ash into the hole, and then swipe dirt back into the hole using their right foot. The distinguishing feature of aerobic sowing systems are direct-seeded in free-draining, dried soils where no standing water layer is maintained in the field, and roots grow in a mainly aerobic environment.

Discussion

North Korean seasoned farmer well recognized hydrological environments combined irrigated yield system with adaptation to aerobic soils. In most North Korea upland rice-growing areas, soils are acidic and infertile. CFT developed sowing techniques direct seed covered by urine with ash. A person excretes about 300gram feaces and 1 liter urine in a day. In P'yŏngan Province toilets with hygiene knowledge ecological sanitation are found to be suitable in the community where there is scope for urine and feaces with ash. These are only possible for Korea in East Asia, because of very efficient heating and cooking system. Ondol system in Korea are firebox accessible from kitchen and bedroom can daily produce ash. Daily producing ash, urine and feaces is key element for dry farming *gŏnsari*.

However the dominant view held in Korean academia completely contradicts the nature of the 'dry rice farming method' arguing that CFT was published in order to disseminate the wet-field farming developed in Chŏlla, Kyŏngsang, and Ch'ungchŏng Provinces of the Southern part of Korea to the less developed farmland of P'yŏngan and Hamkyŏng Provinces of the Northern part. However the foreword in CFT clearly states that the knowledge of advanced farming techniques in all the provinces were acquired through multiple trials, with no evidence of advanced or less developed regions. This article believes the wet-field

farming biased view is flawed, as the main content of CFT addresses techniques that were based on the mountainous areas and dry fields found throughout most of the Korean peninsula. Thus, this study claims that King Sejong sought to standardize the wisdom and experience of the dry-field farming developed by P'yŏngan and Hamkyŏng farmers and the wet-field farming developed by Chŏlla and Kyŏngsang farmers in a national language and also combine the two methods. The evidence in support of the compilation of CFT as the opportunity for inventing the national system of communication, hangŭl, can be found in the experiences of the sowing methods of early-ripening rice varieties in the northern and southern border regions. As rational farming methods native to Korea worthy of international recognition, the 'dry rice farming method' of Northern part particularly P'yŏngan Province should rather be judged as among the most advanced farming methods.

Here we can see King Sejong's innovative idea to exchange the rice varieties planted in the southern Chŏlla, Kyŏngsang, and Ch'ungchŏng Provinces with those of the northern P'yŏngan and Hamkyŏng Provinces to discover the best sowing periods in each region in order to develop early-ripening rice varieties. Between the compilation of CFT in 1429 and invention of hangŭl in 1446, King Sejong dispatched Pak Kŭn of Pyŏngan in 1438 and also commanded him to survey the migrations of southerners in Chŏlla, Kyŏngsang, and Ch'ungchŏng Provinces. Pak G ŭ n then went to each village in the southern provinces and demanded that fifty sŏk of early-ripening rice seed be assigned to each village and also exchanged with their own seed. In particular, he took back ten sŏk of seed to Yŏyŏn and Kanggye, and five sŏk of seed to Chasŏng, all villages in the north, and petitioned King Sejong to have the magistrates of each village sow the seeds at the appropriate time in order to test them.

The dry farming in the fifteenth century developed the continuous system planted rice, barley or beans this year and followed with the same next year, but there was a resurgence of interest in crop rotation, intercropping, double cropping and mixed cropping during King Sejong's time. The rotation system alternated rice with barley over two years. The combination system added rotation to continuous cultivation and achieved three harvests every two years, far surpassing all other systems. For paddy fields, this meant the following sequence: summer rice to winter barley or vegetables Petroselinum or parsley was a famous detoxification vegetable, to summer rice (or beans) to winter barley (or vegetables), and so on, resulting in three grain crops over two spring-autumn planting-harvesting seasons. For dry fields the combination system produced summer millet (or beans) to winter wheat to summer beans (or green peas) to winter wheat, and so on, resulting in three crops (two possible grains and a legume) over two spring-autumn planting-harvesting seasons [7].

Some of the most important information contained in CFT is the finding of the optimum time for planting, because most crops such as rice, barley, bean and wheat that are seeded too late or too early have lower or higher yield potential no matter how they are cultivated after planting. For example, early ripening varieties are planted as soon as possible for high yield. Therefore, the entire information contained in CFT refers to deciding on determining a planting date for all crops.

The method of developing new knowledge in the foreword of CFT was the collating and standardizing by the state of the experiences of farmers from all over the country. This continued after CFT in its subsequent revised and updated editions. The evidence that CFT emphasized sowing methods can be seen in the outline of its structure, which (excluding the foreword and appendix) consists of eleven chapters of various kinds of rice, legumes, grains, and other crops, the titles of which all ending in the character for seed. Thus, sowing and growing are the core of the techniques presented in CFT, and being consistently concise in its other methods of prepping the seeds, plowing land, and sowing, is titled CFT.

The emergence of grain seeds in international trade and diplomacy in the 15th century also served as contributing factor to the birth of the seed science. The Ming Dynasty dispatched diplomatic envoys to Chosŏn in the 15th century, mainly asking about the seeds of rice especially early-ripening rice. This illustrates that the seeds were subject to special management by the government and that their management was considered a diplomatic affair. Domestically, seeds were subject to special management in that the state should prepare seeds beforehand in case of natural disasters. In 1424, King Sejong instructed the Ministry of Taxation to give special supplies to all households in eight provinces, Kyŏnggi, Ch'ungchŏng, Chŏlla, Kyŏngsang, Hwanghae, P'yŏngan, Kangwŏn, and Ham-gil, all of which were requesting seeds and staples, and to report the quantities provided. He was worried that the seeds to be used for farming would be eaten since the provinces had suffered from famine the previous year and reserves were too low. If this happened, the quantity of planting seeds would be insufficient at planting time that year, making farming impossible. If there were insufficient seeds for planting then there would be a series of hunger years, and the famine would recur. Therefore, in order to prevent such a vicious circle, seeds were provided in accordance with the proper seasons. In other words, providing seeds in accordance with the timing of the planting season was a special measure taken at the state level to prevent the greatest crisis.

As we can see, the nation's top leader made the "securing of seeds" a top priority of national policy in the 15th century, when natural disasters occurred one after another. The importance of seeds was also keenly recognized at the national level when the Ming Dynasty demanded seeds. We can safely assume that the reason seed preparation is discussed in Chapter 1 of *"CTF"* stems from the fact that the Ming had on several occasions demanded seeds during the early part of King Sejong's reign. We know demands arrived in 1423, 1430, and 1431. In 1423 specifically, the Ming Dynasty demanded, in their trade items, ten *sŏk* of early ripening varieties and five *sŏk* of late ones. In this year, Sejong delivered a royal edict to order the governor of P'yŏngan to carry the rice varieties requested by the Ming envoy to Ŭiju in advance and wait with them. That the Ming required twice as many early-ripening rice seeds as late-ripening seeds indicates that Chosŏn was superior to China in the breeding and cultivation of early-ripening varieties. (*Annals of King Sejong* 05/09/02). In 1430, *Yun Pong*, a Chinese envoy was from Korea, but became Chinese high rank offial position, demanded 30 *mal* of early ripening rice. He was from *Hwanghae* province and was the most important figure in diplomatic relations between Chosŏn and China at that time. This year he asked for 30 *mal* of early-ripening varieties [8], all of which King Sejong granted.

King *Sejong* delivered a royal edict to the governor of *P'yŏngan*, saying "As envoy *H ă iShòu* asks for rice seeds, select ten *sŏk* of early ripening varieties and five *sŏk* of late ones, carry them in advance to *Ŭiju*, and give it to him when he returns." In 1430, the Chinese envoy asked for 30 *mal* (approx. 30 kgs) of seeds of early-ripening rice again, which King Sejong allowed to give to him. (*Annals of King Sejong*, 13/09/08). In one of the most famous cases where the Chinese imperial court demanded and obtained early ripening varieties from other countries, it demanded them from Chăm Pa that existed across today's Vietnam and Laos. The origin of these varieties is known to be the Vietnamese mountainous area where the rice terraces had been developed. They

were imported from this region with special care by the Song Dynasty in the 11th century and successfully produced in China. Ping-Ti Ho describes the technology as "the core of the 'agricultural revolution' in early-modern East Asia" [9] and as a core technology in the history of China's scientific and technological development that is more important than water control and irrigation projects for agricultural land [10].

CFT became known internationally in the late nineteenth century and Japanese colonial period through a French bibliographic scholar and a Japanese agricultural scholar respectively. In the late nineteenth century, the French bibliographic scholar Maurice Courant (1865-1935) compiled Bibliographie coréenne as a three volume set in 1894 as a result of having intensively purchased and researched Korean texts that were printed in the Koryŏ and Chosŏn periods while he was in Korea as secretary to the French legation from 1890 to 1892. CFT appears as entry 2554 in Courant's bibliography, and is introduced as a text compiled by royal command through surveying farmers throughout the eight provinces.

During the Japanese colonial period, Japanese agricultural scholar Takahashi Noboru (1892-1946) conducted on-site surveys and studied old farming texts in his research. In June 1919, he was appointed to the Japanese Governor-General's Industrial Model Farm (Experimental Farm) in Suwŏn Korea and he surveyed farming techniques throughout Korea while he stayed in the country for twenty-seven years until the end of World War II. So impressed was he by the intensive farming methods practiced by Koreans that he praised them as advanced technologies that were unimaginable in Europe and the United States, and his mention of CFT in a literary source makes him as the most conscientious Japanese agricultural scholar during the Japanese colonial period. Takahashi summarizes CFT as multi-cropping systems. He had no doubt that Korea's complex and intensive systems filled an important role in the development of rural society in Chosŏn dynasty.

Takeda Shōchishiro further emphasizing that the dry farming method in Northern part of Korea could not exist without the sequence of growing barley, legumes, and millet. The barley winter crop was the main focus of this method, and as intercropping and companion cropping were also possible with this method, large and wide embankments were built in which barely was planted in between the embankments and furrows to shield them from the cold winter winds and to irrigate them with water. In contrast, legume crops were sown on top of the embankments as they were resistant to drought in their early stages of growth. Thus, the intercropping of barley and legumes, wherein the former needed shade and the latter needed sunlight, was the perfect match. If legumes were planted on the embankments, then water did not stagnate even during the rainy season and the leaves flourished, shading the barley in the furrows. The inclusion of millet into this method was because it was a crop that could be sown anytime and grew quickly despite barrenness of the land and receiving little fertilizer.

He argued in the late 1930s that Japan should appreciate Korean complexities created in the traditional Korean rural area and the achievements of Korean agricultural experience. He proposed abandoning the imposition of Japanese-derived models and, in essence, argued for abandoning the colonial policy forced into monoculture. When his extensive field study of Korean agriculture was re-printed in 1998 [11], one of the editors, Kuiinuma Jirō, wrote in his introduction that 45 years of study had taught Kuiinuma that the modernization of agriculture can only succeed if it is based on locally developed tradition. These scholars concluded that the Japanese Empire's focus on expanding wet-rice cultivation was inappropriate to the circumstances and that Korean traditional agriculture had achieved high productivity through a judicious mix of dry and wet fields with beans and barley playing a more versatile and stable role than rice. He admired King Sejong's national project concerning the multiple cropping systems in the 15th century as described in CFT.

Conclusion

The existence of CFT in the fifteenth century Korea testifies to the inventiveness of Korean farmers in their use and management of limited resources, biodiversity, ecosystem dynamics, and ingenious use of physiognomies of the Korean topography, categorized for traditional knowledge, practices and technologies. Whether recognized or not by the scientific community, these ancestral agricultural systems constitute the foundation for contemporary and future agricultural innovations and technologies.

Now-a-days, the risk of water shortage and increasing surface ozone in our planet represents a potential threat to the environment and affects everyone all around the world. Therefore, we are faced with the need for a more effective strategy to improve agricultural production without the environmental damage associated with conventional methods of increasing crop yields. CFT suggests an optimistic scenario for the future and against the growing threat the climate change poses to global food security. The knowledge of CFT could contribute to reduce surface O_3 concentrations thus providing an excellent opportunity to increase global grain yields [12] without the environmental degradation associated with organic land cultivation.

Next, by highlighting the fact that the planting techniques and grain labels developed by CFT were used to plant grains in infertile lands, it suggests that these techniques could be applied by both petty and wealthy farmers for extensive or intensive farming, which differs from the analysis that intensive farming was practiced only by farmers with small land holdings [13].

In conclusion, we have learnt through CFT its contents the richness and abundance of agricultural knowledge in Korea, dating from centuries ago when the main concern of the dynasty was to guarantee a constant supply of crops that could be cultivated using techniques that were familiar and that could solve problems unique to the geographic conditions of these lands. In this sense, the compilation of valuable knowledge speaks of a will to preserve the agricultural culture of its people looking forward to pass it on to future generations that could build on it.

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