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The Agricultural Economy of the Sanxingdui Culture (3700–3100 BP): Archaeological and Historical Evidence from the Chengdu Plain

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Abstract: Agriculture is a critical foundation for the development of large-scale complex and urban societies. Sanxingdui, located on the Chengdu Plain in western Sichuan and linked with the ancient Chinese Shu Kingdom, is one of the most distinctive archaeological sites in the world. However, despite its importance, the agricultural economy of the Sanxingdui culture and the Chengdu Plain remains poorly understood and heavily debated. This study synthesizes recent archaeological and historical evidence concerning the agricultural economy underpinning the increasing scale and social complexity at Sanxingdui and the greater Chengdu Plain prior to 2200 BP. Our analysis finds a mixed rice and dry-land millet farming economy, in conjunction with pig and chicken husbandry, during the Sanxingdui culture (3700–3100 BP). This integrated agricultural system likely began with the Baodun culture (4500–3700 BP), passing to the Sanxingdui culture (3700–3100 BP), Shierqiao culture (3100–2600 BP) and later, the Shu culture (2600–2300 BP). In addition, although gathering, hunting, and fishing accounted for relatively low proportions of the overall subsistence, the ancient peoples at Sanxingdui and across the Chengdu Plain continued these practices, supporting a diverse agricultural and food system. Understanding the subsistence at Sanxingdui offers key insights into the development of complex societies in southwest China, the contributions to Chinese culture, and the role of agriculture worldwide.

Keywords: Sanxingdui civilization; agricultural economic; historical documents; rice–millet farming; livestock raising

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1. Introduction

The emergence of agriculture signals a crucial transformation of human history, representing the active modification of plant and animal species and the creation of stable food surpluses [1–5]. China is a global center of plant domestication, as evidenced by two independent domestication events [6–8]. In North China, communities along the Yellow River developed rainfed dry-land farming of foxtail and broomcorn millet [7,9,10], while in South China, peoples along the middle and lower Yangtze River developed systems of irrigated rice cultivation [8,11–13]. Agricultural subsistence forms the material and economic foundation for all contemporary human societies, and its emergence transformed many ancient cultures, leading to larger-scale social organization and urbanism [3,14,15]. Furthermore, the surpluses generated by ancient agricultural systems were a necessary precondition

for the formation of ancient states [16,17]. Archaeobotanical evidence indicates that the agricultural systems of the Shang-Zhou culture (3600–2256 BP) in the North Central Plains focused on dry-land millet cultivation, and the Liangzhu culture (5300–4300 BP) along the lower reaches of the Yangtze River focused on irrigated rice cultivation [18–21]. However, despite its critical importance as one of the three major civilizations in China alongside the Shang-Zhou and Liangzhu cultures, the agricultural economy of the Sanxingdui culture (3700–3100 BP) remains relatively understudied and ambiguous.

The Sanxingdui culture, dating to approximately 3700–3100 BP, was widely distributed on the Chengdu plain, with a distinctive material culture far different from any other archaeological culture found in China [22,23]. The Sanxingdui site in Guanghan City, Sichuan Province, was first discovered in the late 1920s. The site was made famous by excavations of the No. 1 and No. 2 sacrificial pits in the 1980s, where bronze masks, bronze standing figures and bronze sacred trees were revealed [22,23]. Recent excavations of six newly discovered sacrificial pits in Sanxingdui in the 2020s resulted in the significant finding of large gold masks, a large bronze *zun*, a jade cong and jade spear, ivory, ivory carvings and other cultural relics [24]. Research on the Sanxingdui site and culture has primarily focused on the dating of the culture and site [25,26], bronze smelting technology [27–29], jade stone and bronze wares [28,30–32], organic residue analysis [33], the organization and weaving processes of silk fabrics [34,35], the restoration experiment of sacrificial scenes [36,37], and the preservation of ivory specimens [38–40]. However, the focus on the remarkable material culture of Sanxingdui has meant that few studies have looked at the agricultural economy that supported the Sanxingdui culture and broader Chengdu Plain subsistence.

In the last 20 years, the application of archaeobotanical flotation to archaeological excavation has greatly improved our understanding of pre-Qin (before 2200 BP) agriculture in the Chengdu Plain, although scholarly interpretations vary [41–49]. Some researchers divide the early Chengdu Plain agricultural systems into three stages: the early and late Baodun culture (4600–3700 BP), primarily cultivating rice; the Shierqiao culture (3100–2600 BP), cultivating a mix of rice and millet; and the late Shu culture (2600–2200 BP), once more focusing on rice cultivation [50–52]. Other scholars maintain that due to the limited use of flotation, existing data only support the view that the Baodun and Shierqiao agricultural systems relied on rice cultivation, supplemented by a small proportion of dry-land agriculture [53,54]. D'Alpoim Guedes argued that prior to 2200 BP, the Chengdu Plain primarily practiced rice-based agriculture supplemented by dry-land foxtail cultivation [42]. Excavations from the Baodun site found that the proportions of foxtail cultivation increased significantly during the late Baodun culture (approx. 4000–3700 BP), then decreased slightly during the Sanxingdui period (3700–3100 BP), before increasing once more during the Shierqiao culture (3100–2600 BP) [44,55]. Jiang argues that the Chengdu Plain agriculture was predominately dry-land millet cultivation during the early Guiyuanqiao culture (4900–4500 BP), but after 4500 BP, it shifted to a focus on rice with some millets. This rice-based agriculture dominated from the late Baodun (4000–3700 BP) to the Shierqiao (3100–2600 BP). However, after 3200 BP, Jiang argues that millet cultivation once more increased, returning to a mixed system of rice heavily supplemented by millets [56]. The source of these different views lies in the ambiguity of the archaeobotanical record from the Sanxingdui period.

The Sanxingdui culture (3700–3100 BP) was a continuation of the late Neolithic Baodun culture (4500–3700 BP) in the southwest Chengdu Plain, and was succeeded by the Shierqiao culture (3100–2600 BP) in the southeast Chengdu Plain [57]. While the agricultural systems of the Sanxingdui culture have long remained poorly understood, the publication of new archaeobotanical studies from Sanxingdui and Jinsha [58–64] provides an opportunity to investigate the long-term agricultural economy of the Chengdu Plain. To supplement this new data, this paper also draws on the historical texts "Records of Huayang Kingdom" and "Classic of Mountains and Seas", which record the agricultural economy of the Chengdu Plain "Du Yu" era (corresponding to the Sanxingdui culture). This paper synthesizes the newly published zooarchaeological and archaeobotanical data with

other archaeological findings and historical documents to better understand the agricultural economic foundation supporting the formation of the ancient Sanxingdui Shu civilization.

2. Study Area

The Chengdu Plain (103°2′–104°53′ E, 29°50′–31°26′ N) is in the western part of the Sichuan Basin. It extends from the Qionglai Mountain in the west to the Longquan Mountain in the east, Jiuding Mountain in the north and Xiongpo Mountain in the south. This area is also known as the Penxi Plain or the Western Sichuan Plain (Figure 1). The plain is formed by overlapping alluvial fans formed by the Min and Tuo rivers originating from the mountainous areas of the northwest Sichuan Plateau. The plain is 166 km long from north–south and about 192 km wide from east–west, covering a total area of approximately 12.4×10^3 km^2, accounting for 2.6% of the total area of Sichuan Province. The region is characterized by a subtropical humid climate, with a long frost-free period, and distinct seasons, with an average annual precipitation of 1000–1300 mm and mean annual temperature of 16.1 °C [65,66]. Between 3700 BP and 3100 BP, pollen evidence indicates vegetation dominated by subtropical evergreen broad-leaved forest of *Ulmus* and *Fagus*, and by grassland and meadows of Gramineae, Asteraceae, and Polypodiaceae [67–69]. The Chengdu Plain has numerous rivers and fertile soil, making it an important agricultural and grain-producing area in ancient and contemporary China. Modern food and grain crops include rice, wheat, and corn, with two to three crops per year, as well as fruits such as peaches, plums, grapes, kiwifruit, as well as some medicinal herbs and teas. The key economic crops include rapeseed and cotton.

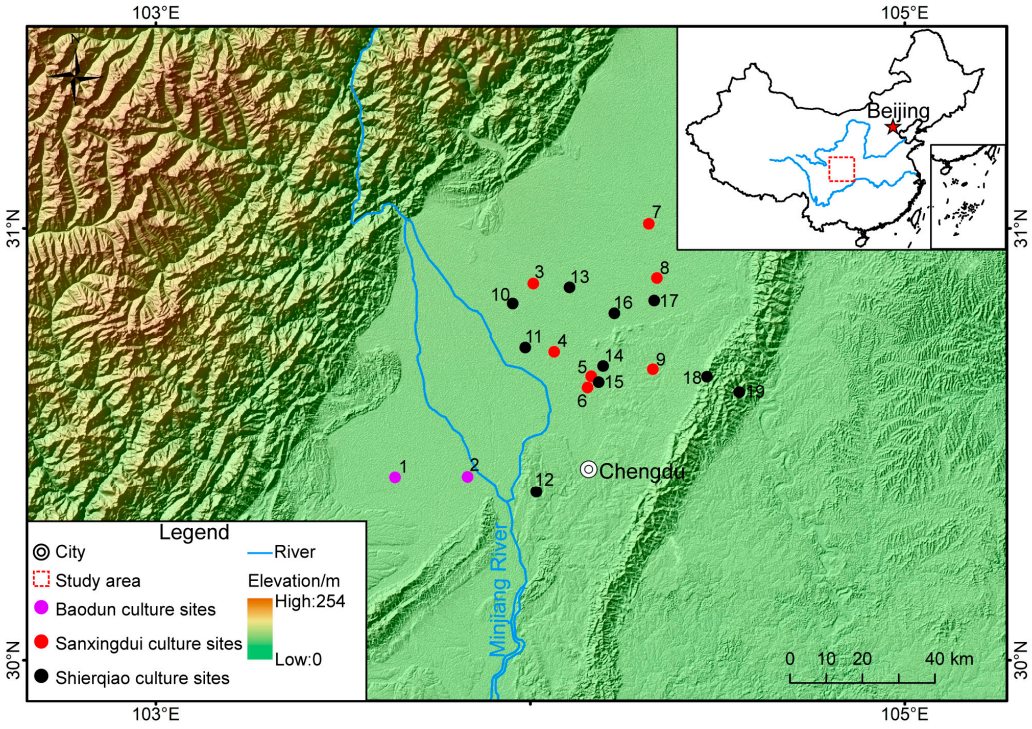


Figure 1. Study area and Chengdu Plain archaeological sites. Baodun culture sites (4500–3700 BP): 1. Gaoshangucheng; 2. Baodun; Sanxingdui culture sites (3700–3100 BP): 3. Songjiaheba; 4. Zhonghaiguoji Community; 5. Shangyejie; 6. Fangchijie; 7. Sanxingdui; 8. Sanxingcun; 9. Jinsha; Shierqiao culture sites (3100–2600 BP): 10. Bolocun; 11. Yongfucun; 12. Sanguantang; 13. Taipingcun; 14. Xingchengjian; 15. Zhihuijie; 16. Yantangcun; 17. Chujiacun; 18. Shierqiao; 19. Sanhehuayuan.

The ancient culture of the Chengdu Plain prior to 2200 BP was characterized by long-term cultural continuity and complexity [42]. Historians and archaeologists often link the Sanxingdui site and Chengdu Plain cultural sequences with historical records and evidence of the ancient Shu Kingdom [70,71]. The accepted chronology of the Chengdu Plain is out-

lined here, with contemporaneous cultures listed: (1) Guiyuanqiao culture (5100–4600 BP), represented by the Guiyuanqiao site in Shifang, corresponding to the Miaodigou Phase II culture in the North China [72]; (2) Baodun culture (4500–3700 BP), represented by the Baodun site in Xinjin District and Gaoshangucheng site in Dayi county, contemporaneous to the Longshan culture in the central Plains [57]; (3) Sanxingdui culture (3700–3100 BP), represented by the Sanxingdui site in Guanghan and Sanxingcun site in Qingbaijiang District, contemporary with the Erlitou culture phase IV to Yinxu culture phase II in the North China [73]; (4) Shierqiao culture (3100–2600 BP), represented by the Shierqiao site in Jinniu District and Jinsha sites in Qingyang District, contemporary to the early Western Zhou Dynasty to the early Spring and Autumn Period in the Central Plains [74,75]; and (5) late Shu culture (2500–2200 BP), represented by the Shangwangjiaguaijie and Xinyicun sites in Chengdu, contemporary to the Late Spring and Autumn Period to the Warring States Period in the Central Plains [57,76].

3. Materials and Methods

This analysis synthesized published materials on the plant and animal evidence unearthed at Sanxingdui and archaeological sites across the Chengdu Plain. Archaeological sites dating between 3700 and 3100 BP with published zooarchaeological and archaeobotanical information include the Sanxingdui site (including the sacrificial area location and Qingguanshan location), Sanxingcun site, Jinsha site (including the sacrificial area location and location 5C, Jinniu District), Zhonghaiguoji community and Songjiaheba site (Figure 1). Since the Jinsha-Shierqiao culture (3100–2600 BP) was a continuation of the Sanxingdui culture (3700–3100 BP), insights into the Sanxingdui agricultural systems can be inferred from zooarchaeological and archaeobotanical data from Shierqiao sites. A large number of archaeological sites from the Shierqiao cultural period contain this evidence, including Shierqiao, the Xinyicun location of Shierqiao, the Jinsha site group, Huayuan, Yongfucun, Boluocun, Sanguantang, Yantangcun, Chujiacun, Taipingcun, Zhihuijie and Fangchijie.

Textual evidence provides a more comprehensive understanding of the agricultural systems developed on the Chengdu Plain prior to 2200 BP, and these data are key to this analysis. We draw from textual evidence from the *Ba Zhi* and *Shu Zhi* in the regional gazetteer Records of Huayang Kingdom. These works were compiled by the historian Chang Qu and record historical events, products, and historical figures in the *Ba* and *Shu* regions from ancient times to the third year of Yonghe in the Eastern Jin Dynasty (AD 347). In addition, we include evidence from the "Classic of Mountains and Seas", dating to approximately 2400 BP, a record of ancient *Shu* mountains and rivers, local folk customs, natural resources and legends. Integrating these texts with archaeological evidence, ranging from plant and animal remains to agricultural tools, ceramic, and bronze artifacts, allows for a better understanding of the agricultural production and practices of ancient peoples. This approach provides novel insights into the agricultural economy at Sanxingdui and across the Chengdu Plain.

4. Results and Discussion

Agriculture utilizes the growing and cultivation of animals and plants to provide food and other products [77]. We follow the definitions of agriculture that include planting, forestry, fisheries, and animal husbandry [78]. From archaeological and historical evidence, the agriculture of Sanxingdui and the Chengdu Plain can be divided into three categories: crop farming, livestock raising, and a combination of gathering, hunting and fishing.

(1) Crop farming

Crop farming refers to the cultivation of plants to obtain grain, subsidiary foodstuff, feed, and raw materials. This includes the cultivation of staple grains like rice and wheat, as well as trees, fruit trees, medicinal plants, and ornamental plants [77]. The crop farming during the Sanxingdui culture (3700–3100) specifically refers to the cultivation of crops.

The staple crops cultivated at Sanxingdui and other sites include rice, foxtail millet, broomcorn millet and soybeans. Macrofossil evidence from the sacrificial area of the Sanx-

ingdui site [79], Qingguanshan location of the Sanxingdui site [79], Sanxingcun site [51], sacrificial area and Jinniu District No. 5C location of the Jinsha site [58,80], Songjiaheba site [81], Zhonghaiguoji community site [60] and Sanguantang site [82] have unearthed the remains of charred rice, foxtail millet, broomcorn millet, and soybean (Figure 2). The evidence of phytolith microfossils from the Sanxingcun site also shows that rice, foxtail and broomcorn millet crops were cultivated during the early Sanxingdui culture (3700–3400 BP) [48]. In addition, several historical texts record that the crops cultivated by peoples during the Sanxingdui culture included rice, foxtail millet, broomcorn millet and soybean. The "Classic of Mountains and Seas·Hainei jing" recorded that ". . .xī nán hēi shuǐ zhī jiān, yǒu dū guǎng zhī yě, hòu jì zàng yān. yuán yǒu gāo shū, gāo dào, gāo shǔ, gāo jì. . ." (Figure 3a). This indicates a "*Du guang zhi ye*" in the area where the black river flows in southwestern China, where fragrant and sweet-tasting foods such as soybeans, rice, foxtail millet, and broomcorn millet were produced. According to later annotations such as Yuan Ke's "Annotations on the Classic of Mountains and Seas" and Yang Shen's "Supplementary Annotations on the Classic of Mountains and Seas", the location of the "*Du guang zhi ye*" is in the region of the ancient Shu Kingdom, on the present Chengdu Plain.

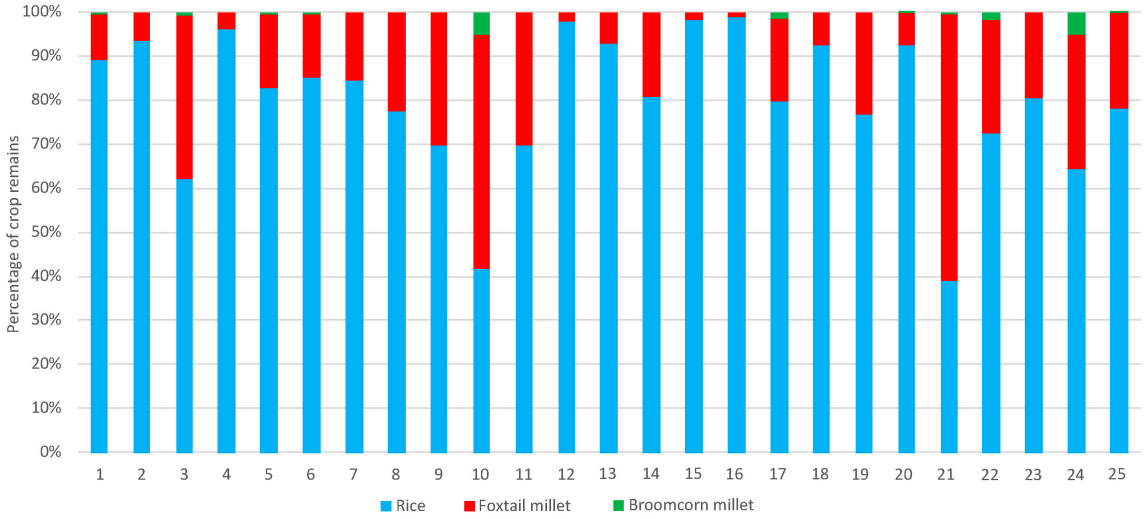


Figure 2. Crop seed assemblages from the Sanxingdui and Shierqiao: 1. Sanxingdui; 2. Qingguanshan location of the Sanxingdui site; 3. Sanxingcun; 4. Songjiaheba; 5. Zhonghaiguoji community; 6. sacrificial area of the Jinsha site; 7. Jinniu District No. 5C location of the Jinsha site; 8. Sanguantang; 9. Jinniu District No. 5C location of the Jinsha site; 10. Yangguangdidai Phase II of the Jinsha site; 11. Yangguangdidai of the Jinsha site; 12. Huayulang; 13. Languang Yongjinwan; 14. Qibazu; 15. Zhuxin Kejiyuan; 16. Xinyicun location of the Shierqiao site; 17. Sanhehuayuan; 18. Xingchengjian; 19. Bolocun; 20. Kuanjin location of the Bolocun site; 21. Sanguantang; 22. Yantangcun; 23. Chujiacun; 24. Taipingcun; and 25. Yongfucun.

In addition, the "Records of Huayang Kingdom·Bazhi" record "chuān yá wéi píng, qí jià duō shǔ, zhǐ jiǔ jiā gǔ, kě yǐ yǎng fù, yě wéi fù qiū, bǐ jì duō yǒu, jiā gǔ zhǐ jiǔ, kě yǐ yǎng mǔ" (Figure 3b). This text indicates that ancient peoples planted broomcorn millet on flat river terraces and foxtail millet on raised hills, using them to make wine and, along with rice, support their parents. A large number of wine vessels were unearthed from the Sanxingdui site, including bronze *zun* for making wine, pottery *he* for warming wine, pottery pots and bronze pots for holding wine, and pottery *jue* and bronze *jue* for drinking wine [21,73]. The presence of bronze *zun* wine-making vessels indicates that Sanxingdui agriculture produced enough surplus grain for the luxury goods production of wine. Simultaneously, a large number of well-crafted cooking utensils and wine vessels were excavated at Sanxingdui. These prestige goods indirectly demonstrate the presence of the ruling class of the ancient Shu Kingdom, indicating that class differentiation had begun to emerge.

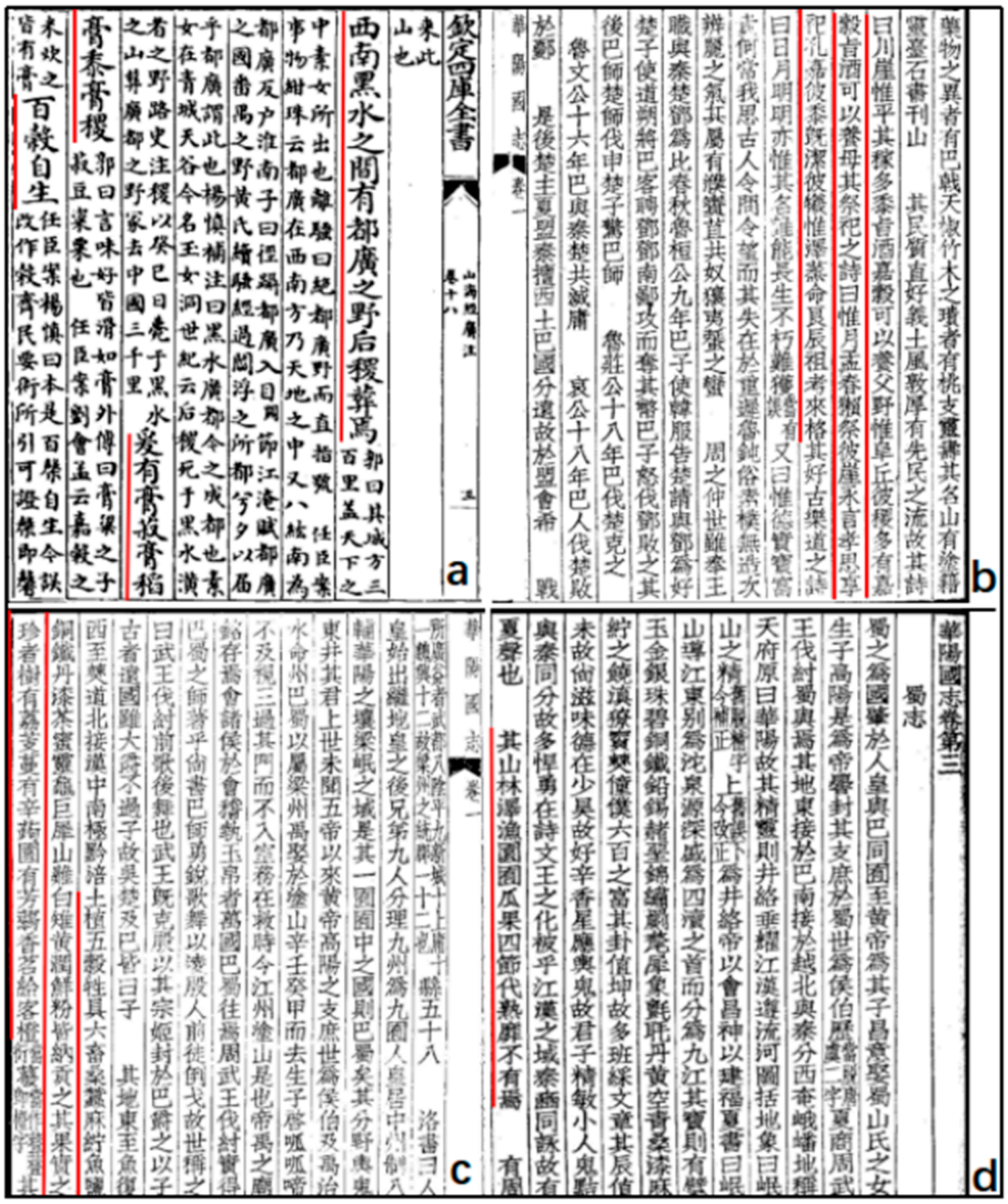


Figure 3. Historical records of crops planted during Sanxingdui culture periods. (**a**) The Classic of Mountains and Seas, Volume 18; (**b**) Records of Huayang Kingdom, Volume 1; (**c**) Records of Huayang Kingdom, Volume 1; (**d**) Records of Huayang Kingdom, Volume 3.

The "Records of Huayang Kingdom·Bazhi" record "tǔ zhí wǔ gǔ, shēng jù liù chù" (Figure 3c), reporting the cultivation of five crops and the raising of six kinds of domesticated animals in the Bashu area. In the "Rites of Zhou", the "wǔ gǔ" generally refer to rice, foxtail millet, broomcorn, wheat, and soybean. The combined archaeological evidence and historical records indicate that rice, foxtail millet, broomcorn millet and soybean were cultivated during the Sanxingdui ancient Shu civilization in the Chengdu Plain. Systematic archaeobotanical studies not only document the types of crops cultivated but also demonstrate the relative primary and secondary utilization of those crops [83]. Archaeobotanical evidence from multiple archaeological sites shows that the primary agricultural focus was predominately rice agriculture complemented by dry-land foxtail cultivation, with some

broomcorn millet cultivation. At Sanxingdui, 29 carbonized rice seeds and 2 carbonized foxtail millet seeds were unearthed from Sanxingdui cultural contexts dating between the Period II (4000–3600 BP) and III (3600–3200 BP) contexts [79]. Moreover, at the Sanxingcun site in Qingbaijiang District, 69 charred rice, 41 foxtail millet, and 1 broomcorn millet were identified from 14 soil samples [51]. At the sacrificial area at the Jinsha site, 168 rice, 28 foxtail millet and 1 broomcorn millet were found in the Sanxingdui Period III (3100 BP) [59]. At the Zhonghaiguoji section of the Jinsha site, 270 charred rice seeds, 55 charred foxtail millet seeds and 1 charred broomcorn millet were found dating to Sanxingdui phase III (3600–3200 BP) [60].

Artifacts related to rice agriculture are commonly found at sites across the Chengdu Plain. Among the various sacrificial objects at Sanxingdui, many agricultural tools have been unearthed, including stone knives, stone cones, stone adzes, net-sinking devices, spinning wheels, stone pestles, and stone chisels [21,84]. Broadcast sowing of rice requires appropriate farming tools for harvesting and weeding, which the large number of stone knives excavated at Sanxingdui are believed to have been used for [27]. Climatic information from spore pollen data indicates that the climate of the Chengdu Plain was warm and humid between 3700 and 3100 BP, suitable for rice agriculture [69]. Therefore, all the available evidence makes it clear that agricultural systems focused on rice cultivation during the Sanxingdui cultural periods between 3700 and 3100 BP, followed by foxtail millet cultivation, and finally, broomcorn millet cultivation.

The Jinsha-Shierqiao (3200–2600 BP) culture is believed to be a direct regional continuation of the Sanxingdui culture [85]. Archaeobotanical data from 17 sites indicate similar regional patterns to the earlier Sanxingdui culture (Figure 2). Rice cultivation dominated Jinsha-Shierqiao agricultural production, followed by foxtail millet cultivation, with only a small amount of broomcorn millet, soybean, wheat and barley cultivation (Figure 2).

(2) **Livestock raising**

Livestock raising and animal husbandry utilize domesticated animals to obtain meat, eggs, milk, wool, and other products through artificial feeding and breeding [77]. Zooarchaeological evidence provides the most direct evidence of the types of fauna raised by ancient people, as well as the animals' diet and how they were used by ancient peoples [86]. Due to the lack of systematic zooarchaeological study at Sanxingdui cultural sites, only minimal faunal identifications have been made and all from a small number of sacrificial pits at the Sanxingdui site, making it difficult to comprehensively reflect the patterns of animal husbandry. However, due to the Sanxingdui connection to the Baodun (4500–3700 BP) and Shierqiao (3200–2600 BP) cultures, the ample published evidence makes some inferences possible.

The earliest evidence of domesticated animals on the Chengdu Plain comes from the Baodun (4500–3700 BP) and Gaoshangucheng (4500–3700 BP) sites. Faunal analysis at Gaoshangucheng found pig remains making up 93.78% and dogs 3.76% of the faunal assemblage [87]. During the Sanxingdui (3700–3100 BP) period zooarchaeologists identified the limb bones and skulls of pigs, sheep, goats, cattle, and yellow cattle from the bone debris in the sacrificial Pit No. 1 of the Sanxingdui site [87]. During the Shierqiao period (3100–2600 BP), horses and chickens were introduced into regional systems of animal husbandry. At the Shierqiao site, the remains of domestic dogs, pigs, horses and cattle have been found, in addition to wild fauna, including sika deer, rhinoceroses and rabbits [62,88]. Faunal remains excavated from Shierqiao culture sites such as Zhihuijie and Fangchijie are predominately composed of domestic animals and poultry, such as dogs, horses, pigs, yellow cattle and chickens [62,89].

Zooarchaeological evidence from between 3700 and 3100 BP indicates that the domesticated animals raised by the Sanxingdui culture on the Chengdu Plain included pigs, dogs, cattle, sheep, horses, and chickens. This "having all six livestock" pattern of animal husbandry continued after 3100 BP to the later Jinsha-Shierqiao culture. Notably, this pattern is documented in textual evidence. Written in "*Ba Zhi*" in the "records of Huayang Kingdom" is "tǔ zhí wǔ gǔ, shēng jù liù chù" (Figure 3c). This relates that in the Bashu

region, five kinds of crops were cultivated and six kinds of domesticated animals were raised. According to the "Zuo Zhuan" recorded, the "liù chù" generally refer to domesticated animals such as horses, cows, sheep, chickens, dogs, and pigs. Animal iconography and images are key portrayals of cultural beliefs and practices surrounding agricultural systems [90]. Ceramic sculptures of pigs, horses, sheep, rats, and birds, and copper sculptures of chickens, snakes and tigers, have all been unearthed at the Sanxingdui and Jinsha sites [22,23,91].

While there is a wide diversity of faunal taxa represented across the sites and cultures, pig remains account for the largest proportion of all the unearthed faunal remains in all the assemblages. Pig remains account for more than 50% of the total unearthed animal bone remains in some sites, including 93.78% at the Baodun site [63], 66.26% at the Xinyicun location of the Shierqiao site [88], and 60% at the Zhihuijie site [89].

(3) **Collecting, hunting and fishing**

The evidence is clear that by 3700 BP ancient peoples on the Chengdu Plain practiced mixed rice and dry-land millet farming in conjunction with animal husbandry. There is additional evidence of subsistence practices supplemented by gathering, hunting, and fishing. Wild plant remains have been documented at multiple sites. Evidence of 189 carbonized, likely wild *Pisum* L. seeds were unearthed from the Shang and Zhou contexts (3000–2300 BP) at the Zhonghaiguoji Site [60]. The remains of collected fruits such as peaches (*Prunus persica* (L.) Batsch) and wild grapes (*Vitis flexuosa* Thunb.) were recovered in Sanxingdui cultural contexts (3700–3100 BP) at the Songjiaheba site [81]. Gathering remains of *Vitis* L., *Amygdalus* L., *Prunus* L., *Choerospondias axillaris* Roxb., and *Cucumis melo* L. have also been excavated in the Shierqiao contexts (3200–2600 BP) at the Jinsha site [80].

There is ample evidence of human use of diverse wild animal species during the Sanxingdui period (3700–3100 BP). The remains of hog badger (*Arctonyx collaris*), black bear (*Ursus thibetanus*), rhino (*Rhinocerotidae*), Asian elephant (*Elephas maximus* Linnaeus), wild boar (Sus scrofa), sambar (*Rusa unicolor*), Bornean red muntjac (Muntiacus muntjak), Chinese muntjac (*Muntiacus reevesi*) and other animals were found in the Sanxingdui cultural layers of the Jinsha site [63]. At the Shierqiao site, the wild faunal remains including common mallard (*Anas platyrhynchos*), Tibetan Macaque (*Macaca thibetana*), hog badger (*Arctonyx collaris*), black bear (*Ursus thibetanus*), rhino (*Rhinocerotidae*), Chinese muntjac (*Muntiacus reevesi*), sambar (*Rusa unicolor*) and sika deer (*Cervus nippon*) were excavated from the Yinxu phase III to early Western Zhou Dynasty contexts (approx. 3300–3000 BP), comprising 35% of the total unearthed animal remains [62]. In the Shierqiao cultural contexts (3200–2600 BP) at the Shierqiao site, similar species of wild faunal remains were found, with Cervidae accounting for 19.94% of the total assemblage [88]. Wild boar (Sus scrofa), Chinese muntjac (*Muntiacus reevesi*), sambar (*Rusa unicolor*) and sika deer (*Cervus nippon*) were found in the Shierqiao cultural layers (3200–2600 BP) at the Zhihuijie site [89]. Aquatic resources were less utilized during the Baodun, Sanxingdui, and Shierqiao cultural periods on the Chengdu Plain. The single exception is the large number of seashells found in a sacrificial pit at the Sanxingdui site. At the Shierqiao site between the Yinxu Phase III and early Western Zhou contexts (approx. 3300–3000 BP), only the remains of sturgeon (*Acipenser sinensis*) and common carp (*Cyprinus carpio*) were found [62]. At the Zhihuijie site, some turtles and fish were found dating to the Shierqiao culture (3200–2600 BP) [89].

The widespread evidence of regional and chronological links between the Sanxingdui and Shierqiao cultures indicates that the populations of both sites followed similar patterns in the use of wild plant and animals. Each culture supplemented a diverse agricultural system of production with the widespread gathering of wild plants and hunting of wild game.

5. Conclusions

This synthesis, drawing from the published archaeological and textual evidence of the Sanxingdui and Shierqiao cultures, presents a clarified view of the ancient agricultural economy and subsistence practices on the Chengdu Plain. The Sanxingdui culture prac-

ticed a diverse agricultural economy relying on mixed cropping and animal husbandry supplemented by gathering, hunting, and fishing. Cultivation primarily focused on rice agriculture, with some millet, supplemented by wild plant foraging. Livestock raising relied on the "having all six livestock" pattern, integrating domesticated pigs, dogs, cattle, chicken, sheep, and horses, and it was further supplemented by hunting.

This mixed agricultural system began on the Chengdu Plain with the Baodun culture (4500–3700 BP). Between 3700 and 3100 BP, the Sanxingdui culture put into place the agricultural system that would be used by the Jinsha-Shierqiao culture, and later, the Shu culture. It seems likely that this range of agricultural economies supported the remarkable growth and culture found at Sanxingdui, as recorded millennia ago by historians, underscoring the diverse and interconnected nature of ancient Chinese history.

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