Spatial-temporal Distribution Dataset of Qinghai-Tibet Agriculture and Animal Husbandry Enterprises (2011–2021)

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Abstract: Agriculture and animal husbandry enterprises are the core carrier and main body of the Qinghai-Tibet Plateau agriculture and animal husbandry market, and their spatial layout and location characteristics represent the development level of agriculture and animal husbandry and the degree of market allocation. Based on the national enterprise credit information publicity system, Tianyancha and other enterprise information publishing platforms, data mining, collation and compilation are carried out, and the data of Tibet and Qinghai province in 2011 and 2021 are obtained, mainly including enterprise names, industry ownership and other attributes. The analysis shows that the number of agriculture and animal husbandry enterprises in Qinghai-Tibet has increased from 6,460 in 2011 to 45,523 in 2021, among which the growth rate of animal husbandry enterprises is much larger than that of agricultural enterprises. The distribution is mainly concentrated in the valley and continues to spread outward. The dataset includes: (1) spatial distribution data of agricultural and animal husbandry enterprises in Qinghai-Tibet in 2011 and 2021; (2) statistics of the agricultural and animal husbandry enterprises in Qinghai-Tibet in 2011 and 2021. The dataset is archived in .xls and .gdb formats, and consists of 53 data files with data size of 14.3 MB (compressed to one file with 1.82 MB).

Keywords: Tibetan Plateau; agriculture and animal husbandry enterprises; spatial-temporal distribution; enterprise changes; 2011-2021

Dataset Availability Statement:

The dataset supporting this paper was published and is accessible through the *Digital Journal of Global Change Data Repository* at: https://doi.org/10.3974/geodb.2022.07.08.V1 or https://cstr.escience.org.cn/CSTR:20146.11.2022.07.08.V1.

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[2] Liu, L. D., Zhang, W. Z., Ma, R. F., *et al.* Spatial-temporal distribution dataset of Qinghai-Tibet agriculture and animal husbandry enterprises (2011–2021) [J/DB/OL]. *Digital Journal of Global Change Data Repository*, 2022. https://doi.org/10.3974/geodb.2022.07.08.V1. https://cstr.escience.org.cn/CSTR:20146.11.2022.07.08.V1.

1 Introduction

As basic industry, Agriculture and animal husbandry are an important source of income for people in Qinghai-Tibet to improve people's livelihood. Among them, agriculture and animal husbandry enterprises play an important role in the overall development of agriculture and animal husbandry in Qinghai-Tibet, not only solve local people's employment and increase farmers' and herdsmen's income, but also improve the integration and development of the three industries in agriculture and animal husbandry areas. However, due to the restriction of alpine natural geographical environment, the number of agriculture and animal husbandry enterprises in Qinghai-Tibet is small, and the industrialization development of agriculture and animal husbandry is always at a low level. In recent years, with the inclination of the central government's transfer payment funds to the industrialization of agriculture and animal husbandry and the improvement of various infrastructures, the agricultural and animal husbandry enterprises in Qinghai-Tibet region have grown rapidly, and the industrialization level of agriculture and animal husbandry has been greatly improved.

As the core carrier and main organization of agriculture and animal husbandry, the spatial distribution of agricultural and animal husbandry enterprises is the projection of agricultural and animal husbandry industrialization development in geography[1], and the location characteristics directly affect the optimization of regional industrial spatial layout and resource allocation[2–5]; However, the spatial attributes and interrelations contained in spatial distribution affect the development level and production efficiency of regional agriculture and animal husbandry industrialization[6–8]. Since the classical location theory, the problem of industrial location has aroused widespread concern[9,10]. However, there are relatively few studies on the spatial characteristics of agricultural and animal husbandry enterprises from the geographical perspective[11], even less on the condition and spatial-temporal pattern changes of agricultural and animal husbandry enterprises in plateau areas, and the spatial distribution data of agricultural and animal husbandry enterprises in plateau areas are few. Therefore, based on the "Tianyancha"[12] enterprise data query platform, the attribute data of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021 were obtained and verified in the National Enterprise Credit Information Publicity System[13], and the enterprise coordinates of the verified enterprise data were obtained and verified by the Gaode map coordinate picker[14], and finally the spatial distribution dataset of agricultural and animal husbandry enterprises in Qinghai and Tibet was obtained. It should be noted that the Qinghai-Tibet Plateau is defined as two provinces, Tibet and Qinghai, in combination with the amount of data and the availability of data[15]. The industry definition of agriculture, animal husbandry, agricultural specialty and auxiliary activities and animal husbandry specialty and auxiliary activities is based on the National Economic Industry Classification[16].

2 Metadata of the Dataset

The metadata of the Spatial-temporal distribution dataset of Qinghai-Tibet agriculture and animal husbandry enterprises (2011–2021)[17] is summarized in Table 1. It includes the dataset full name, short name, authors, year of the dataset, temporal resolution, spatial resolution, data format, data size, data files, data publisher, and data sharing policy, etc.

Table 1 Metadata summary of the Spatial-temporal distribution dataset of Qinghai-Tibet agriculture and animal husbandry enterprises (2011–2021)

Items	Description
Dataset full name	Spatial-temporal distribution dataset of Qinghai-Tibet agriculture and animal husbandry enterprises (2011–2021)
Dataset short name	AGAHent_TibetanPlateau
Authors	Liu, L. D., Department of Geography and Spatial Information Techniques, Centre for Land and Marine Spatial Utilization and Governance Research, 2011073018@nbu.edu.cn Zhang, W. Z., Key Laboratory of Region Sustainable Development Modeling, Institute of Geographic Sciences and Resources Research, Chinese Academy of Sciences, zhangwz@igsnrr.ac.cn Ma, R. F. AAX-8655-2021, Department of Geography and Spatial Information Techniques, Centre for Land and Marine Spatial Utilization and Governance Research, marenfeng@nbu.edu.cn Li, J. M., Key Laboratory of Region Sustainable Development Modeling, Institute of Geographic Sciences and Resources Research, Chinese Academy of Sciences, lijm@igsnrr.ac.cn
Geographical region	Qinghai-Tibet Year 2011, 2021
Data format	.xls, .gdb Data size 1.82 MB
Data files	(1) The spatial distribution data of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021 (2) The statistics of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021
Foundation	Ministry of Science and Technology of P. R. China (2019QZKK0406)
Computing environment	ArcGIS, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences platform
Address	No. 11A, Datun Road, Chaoyang District, Beijing 100101, China
Data Publisher Address	Global Change Research Data Publishing & Repository, http://www.geodoi.ac.cn
Data sharing policy	*Data* from the Global Change Research Data Publishing & Repository includes metadata, datasets (in the *Digital Journal of Global Change Data Repository*), and publications (in the *Journal of Global Change Data & Discovery*). *Data* sharing policy includes: (1) *Data* are openly available and can be free downloaded via the Internet; (2) End users are encouraged to use *Data* subject to citation; (3) Users, who are by definition also value-added service providers, are welcome to redistribute *Data* subject to written permission from the GCdataPR Editorial Office and the issuance of a *Data* redistribution license; and (4) If *Data* are used to compile new datasets, the 'ten per cent principal' should be followed such that *Data* records utilized should not surpass 10% of the new dataset contents, while sources should be clearly noted in suitable places in the new dataset[18]
Communication and searchable system	DOI, CSTR, Crossref, DCI, CSCD, CNKI, SciEngine, WDS/ISC, GEOSS

3 Data Development Methods

The data of agricultural and animal husbandry enterprises used in the research are mainly obtained from the website of Tianyancha (the query time is from January 11 to 15, 2022). In the advanced search function, we first select the industry as agriculture, animal husbandry, agricultural or animal husbandry auxiliary activities; We select Tibet and Qinghai province; When querying the enterprise data in 2011, we choose the establishment time of 10–15 years and more than 15 years; When querying the enterprise data in 2021, the establishment time is ignored, and the enterprise status is selected as existing. The data of Qinghai-Tibet agriculture and animal husbandry enterprises in 2011 and 2021, including the attributes of enterprise name, enterprise status, city and county to which they belong, are obtained and verified in the National Enterprise Credit Information Publicity System. Further, the registered address of the enterprise will be converted into geographical coordinates through the coordinate picker of Gaode map, and then the coordinate data will be imported into

ArcGIS10.8 for verification and screening. Finally, there were 6,460 agriculture and animal husbandry enterprises in Qinghai-Tibet in 2011, including 2,779 agricultural enterprises and 3,681 animal husbandry enterprises. In 2021, there were 45,523 agriculture and animal husbandry enterprises, including 14,907 agricultural enterprises and 30,616 animal husbandry enterprises. In addition, the vector data of Qinghai-Tibet administrative boundary is based on the year 2020, and comes from the National Geographic Information Public Service Platform[19]. Development process of the dataset is shown in Figure 1.
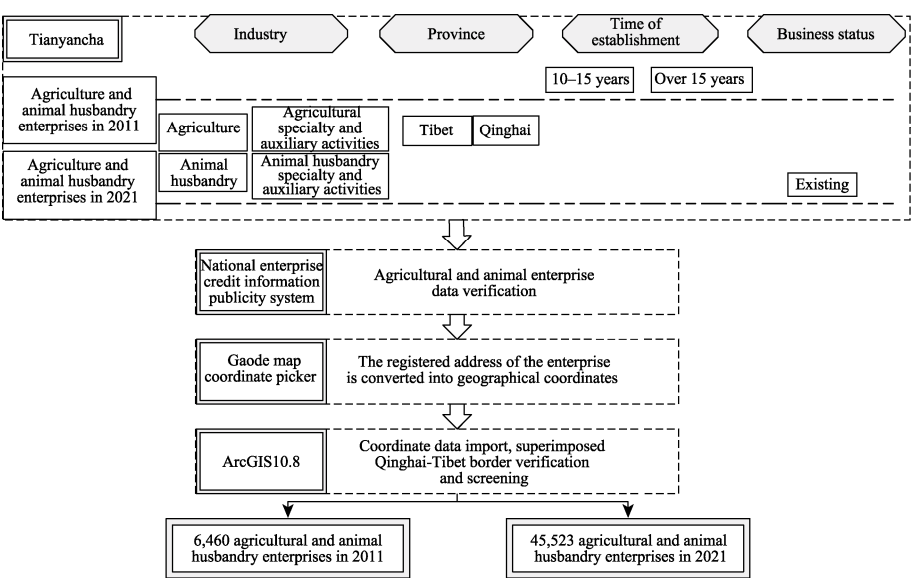

Figure 1 Development process of the dataset

4 Data Results

4.1 Data Products

Spatial-temporal distribution dataset of Qinghai-Tibet agriculture and animal husbandry enterprises (2011–2021) includes two parts, namely, the spatial distribution data of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021 (Figure 2) and the statistics of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021 (Figure 3).

4.2 Data Results

4.2.1 Temporal and Spatial Distribution Changes of Agricultural and Animal Husbandry Enterprises in Qinghai-Tibet

The Qinghai-Tibet Plateau, with an average altitude of more than 4,000 m, is called the "roof of the world" of the earth, and its topography and climate are complex and diverse. Restricted by the cold natural environment, the industrialization of agriculture and animal husbandry in Qinghai-Tibet is developing slowly, with a small number of agricultural and animal husbandry enterprises and extremely uneven distribution, mainly concentrated in low-lying areas such as river valleys. Among them, the Brahmaputra, Lasa River and Nyang

Qu basins are the most densely populated areas in Tibet. In addition, there are many agricultural and animal husbandry enterprises in Nyang River, Chin-sha River, Lancang River and Nu Jiang Valley. From the administrative unit, Tibetan agricultural and animal husbandry enterprises are mainly distributed in Lasa, Shigatse and Nyingchi. Agricultural and animal husbandry enterprises in Qinghai are most concentrated in Huangshui Valley and Yellow River Valley, and there are also a certain number of agricultural and animal husbandry enterprises in Datong River, Lancang River, Chin-sha River valley and the coastal areas of Qinghai Lake. It is worth noting that there is no significant difference between the distribution of livestock enterprises and agricultural enterprises, but the distribution range of livestock enterprises is wider than that of agricultural enterprises. This is because the suitable development area of planting industry is generally distributed in the valley plain below the elevation of 4,300 m, while the highest elevation of animal husbandry can reach 5,000 m, and the requirement of animal husbandry for slope is lower than that of planting industry. Therefore, for the sake of being close to the production area, the distribution of animal husbandry enterprises is wider than that of agricultural enterprises.
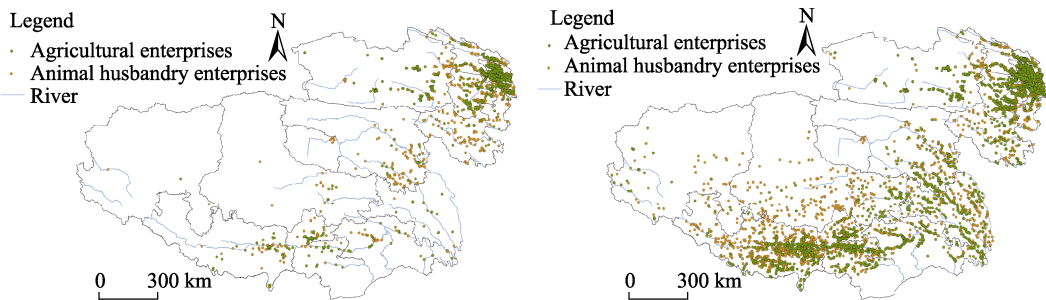

Figure 2   Map of spatial and temporal distribution of Qinghai-Tibet agriculture and animal husbandry enterprises in 2011 and 2021

4.2.2 Spatio-temporal Changes of Agricultural and Animal Husbandry Enterprises in Qinghai-Tibet

The number of agriculture and animal husbandry enterprises in Qinghai-Tibet increased from 6,460 in 2011 to 45,523 in 2021, among which the number of animal husbandry enterprises increased from 3,681 to 30,616, which is much larger than that of agricultural enterprises. There are obvious differences in the number and spatial distribution characteristics of agricultural and animal husbandry enterprises among cities in Qinghai and Tibet (Figure 4). In 2011, the number of agriculture and animal husbandry enterprises in Xining and Lasa ranked first in Qinghai and Tibet respectively, accounting for 33.78% and 30.7% respectively. In 2021, the cities with the largest number of agricultural and livestock enterprises in Qinghai and Tibet were Haidong and Shigatse, accounting for 37% and 54.7% respectively. Although Ngari prefecture has a vast area, it is restricted by the natural geographical environment and its own economic development level. No matter in 2011 or 2021, the number of enterprises is the lowest among all cities. As far as the growth rate of agricultural and animal husbandry enterprises is concerned, the growth rate of agricultural and animal husbandry enterprises in Qinghai-Tibet has basically reached more than 1,000% in the past ten years, among which the growth rate of animal husbandry enterprises is generally larger than that of agricultural enterprises, especially in Tibet. The growth rate of

agriculture and animal husbandry enterprises in Tibet, especially animal husbandry enterprises, is much higher than that in Qinghai. In recent years, the assistance of the state and inland provinces and cities to the Tibet has gradually focused on upgrading the industrial base, and is committed to improving Tibet's self-hematopoietic capacity. Under this background, Tibet's agriculture and animal husbandry industry has developed rapidly, with a higher growth rate than Qinghai, which has a relatively good industrial development foundation.
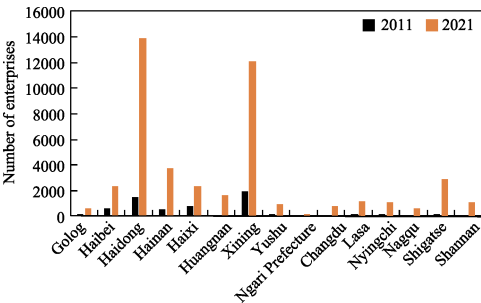

Figure 3   Statistics on the number of agricultural and animal husbandry enterprises in Qinghai- Tibet in 2011 and 2021
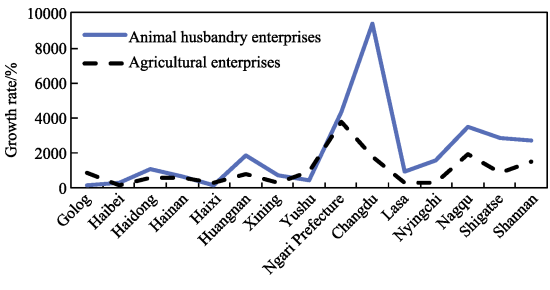
Figure 4   Statistics on the growth rate of agricultural and animal husbandry enterprises in Qinghai-Tibet in 2011 and 2021

5 Discussion and Conclusion

The development of agriculture and animal husbandry enterprises is not only an important way to improve the industrialization of agriculture and animal husbandry, but also an important way to solve the employment of local people. The purpose of studying the spatial pattern evolution and its influencing factors of agricultural and animal husbandry enterprises in Qinghai-Tibet is to understand the spatial characteristics of agricultural and animal husbandry industry development in Qinghai-Tibet and to clarify the direction of future spatial adjustment. The coordinates and related attributes of 6,460 and 45,523 agricultural and animal husbandry enterprises in 2011 and 2021 were collected and proofread through relevant websites, and the spatial distribution dataset of agricultural and animal husbandry enterprises in Qinghai-Tibet was formed. The results show that the agricultural and animal husbandry enterprises in Qinghai-Tibet grew rapidly from 2011 to 2021, and the growth rate basically reached more than 1,000%, among which the growth rate of livestock enterprises was generally higher than that of agricultural enterprises. As far as the distribution of agriculture and animal husbandry enterprises is concerned, both the whole industry and the sub-industry are clustered. Specifically, Brahmaputra, Lasa River and Nyang Qu basins in Tibet and "Huangshui Valley" and "Yellow River Valley" region in Qinghai are the most concentrated. Taking prefecture-level cities as a unit, this dataset intuitively explains the development process and regional differences of agriculture and animal husbandry industry in Qinghai-Tibet. On the one hand, from the perspective of industry's own development, this dataset is helpful to clarify the spatial adjustment direction of agriculture and animal husbandry industrialization in Qinghai-Tibet region in the future, and provide direction and basis for regional development strategy of agriculture and animal husbandry production. On the other hand, from the perspective of sustainable utilization of resources and environment, this dataset can be used to further identify the factors affecting enterprise layout and environmental constraints, and put forward ways to achieve optimal allocation of resources

and transformation and upgrading of resources and environment, so as to assist practical decisions.

Author Contributions

Zhang, W. Z. and Ma, R. F. proposed and promoted the research and development of this dataset, dataset design and data paper revision; Liu, L. D. obtained the data of agricultural and animal husbandry enterprises in Qinghai and Tibet in 2011 and 2021, processed and compiled the dataset, and wrote data papers; Li, J. M. participated in some data processing.

Conflicts of Interest

The authors declare no conflicts of interest.

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