



One Country One Priority Product • Case Study Series

Highlights

Geographical Indications Environment & Sustainability: wide application in diverse agroecological zones and special agricultural products in China

Advocating the combination of science, technology, engineering and communication, GIES promotes (1) open science on the geographical information system, remote sensing, big data and Internet of things (IoT) technologies of physical and human geography; (2) a standard management of agriculture products; and (3) traceability of the products enabled by IoT. An overview of GIES is available at <https://www.fao.org/3/cc7506en/cc7506en.pdf>.

As of November 2023, a total 17 GIES cases have been published through a stringent process of development and scientific assessment as follows.

The GIES standard system

A GIES case needs to be developed in accordance with the GIES standard system. A variety of standards have been established, including for the data list; the evaluation of cases; and the data and data paper publishing.

The GIES data include three major categories: meta data; dataset (data products); and data paper. They are compiled in a CD-ROM (Global Change Research Data Publishing & Repository) with an ISSN code.

(1) Meta data: dataset title, dataset authors and affiliations, abstract, keywords, foundations, figures and references.

(2) Dataset: (a) eco-geographical data; (b) product attributes and testing data;

(c) socioeconomic and management data; and (d) other data related to geo-cultural calendar.

- Eco-geographical data include landforms and landscape data, based on remote sensing images from a digital elevation model (DEM) and the Normalized Difference Vegetation Index (NDVI); meteorological data through monitoring stations; and soil and water characteristics through a sample collection and analysis.
- Product attributes and testing data contain species or varieties and their characteristics, nutritional values and chemical composition.
- Socioeconomic and management data include product and production standards, value chain characteristics and production management.
- Other data include the stories related to historical background and cultural value, photos and videos, among others.

(3) Data paper: The *Journal of Global Change Data & Discovery* is issued four times a year to publish data papers.

Evaluation standard and process

To qualify for a GIES case, 12 content areas are reviewed and scored (Table 1).

Evaluation steps entail three stages. The first review is conducted by dedicated expert editors to check the case for integrity, consistency, accuracy and standardization. In the second review, five to seven experts study the case comprehensively against the evaluation standard. In the third review, the final one, the chief editor makes the final judgment whether the case is qualified as a GIES case.

- Geographical Indications Environment & Sustainability (GIES) is an innovative tool, which uses open science¹ to trace the geographical origin of a specific special agricultural product (SAP)² by assessing and monitoring the quality of the local environment where the product grows. It was developed by the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (IGSNRR/CAS) in collaboration with other stakeholders.
- A GIES case needs to be developed in accordance with the GIES standard system. The GIES data include meta data, dataset (data products) and data paper, of which, dataset comprehensively covers eco-geographical data, product attributes and testing data, socioeconomic and management data, and other data, such as photos and videos. A stringent evaluation is conducted in three steps to assure the quality of the case.
- As of November 2023, a total of 17 GIES cases have been prepared in 11 provinces of China.
- The GIES methodology can be widely applied for SAPs irrespective of agroecological zones, as long as they are associated with unique geographical features. It extends beyond basic scientific research by using open science, and sheds light on the sociocultural values of SAPs. Countries are encouraged to adopt the methodology of their respective contexts.

Key resources

OCOP case studies on GIES good practice cases:

- Geographical Indications Environment & Sustainability (GIES): An innovative initiative to promote scientific research for balanced development (fao.org)
- Development of GI-protected Baoshan Arabica coffee in Xinzhai village, Baoshan city, Yunnan province of China (fao.org)
- Protection of crested ibis (*Nipponia nippon*) habitat with organic black rice in Caoba Village, Yang county, Shaanxi province of China (fao.org)

¹ For more information about open science, please access <https://www.unesco.org/en/open-science>.

² Special agricultural products are agricultural products with unique qualities and special characteristics associated with geographical locations, farming practices and cultural heritages.

Table 1. Evaluation standard for GIES case

No.	Content	Requirements
1	Name of the case	Three parts of the name (product, agroecological zone and location)
2	Partners and team members	Combination of industry, academia, research, government, team members and people (biography); of which, industry and research are required.
3	Role of government	Local government engagement and lead role
4	Area boundary	Digital case area boundary map
5	Team member personal quality	Excellence and expertise of co-authors
6	Type of product	(1) GI products; (2) geographical specific products (potential GI); or (3) geographical traditional-civilized products (potential GI)
7	Ecosystem environment	Type of the ecosystem classification
8	Dataset	Four components described above
9	Data sustainability	Mid- to long-term ecosystem monitoring system
10	Article	Description of the four types of data (case data section); data reliability (data sources, research and development methods, and validation of results, etc.); data analysis and conclusions; and references
11	Statement about the dataset and information provided	Safety, originality or permission for publication for all data and information related to the case
12	Sample of the product	List of sample specimens and samples

Source: Compiled by FAO based on Liu, C. 2023. GIES standard system. Presentation, 20 August 2023. Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences; and Shi, R. 2023. Data quality control and peer review procedure, taking GIES data as an example. Presentation, 20 August 2023. Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences.

Table 2. List of the 17 GIES cases

Products		Case no.	Locations				Agroecological zones
Types	SAP		1. Provincial	2. Prefectural	3. County	4. Township	
Cash crop	Coffee	2	Yunnan	Baoshan city	Longyang district	Lujiang town	Dry-hot valley
	Large hazelnut	11	Jilin	Jilin city	Panshi city	Futai town	Low mountains and hills
Cereal	Rice	3	Jilin	Jilin city	Panshi city	Niuxin town	Permanent farmland
	Black rice	5	Shaanxi	Hanzhong city	Yang county	Zhifang subdistrict	Crested ibis habitat
	Wheat	9	Shandong	Dezhou city	Yucheng city	Fangsi town	River irrigation farmland
	Millet	10	Shanxi	Jincheng city	Zezhou country	Gaodu town	Red clay
	Rice	12	Jilin	Jilin city	Panshi city	-	Permanent farmland
Fruit and vegetable	Chinese cherry apple	6	Jilin	Jilin city	Panshi city	Baoshan town	Low mountains and hills
	Lychee	8	Guangdong	Guangzhou city	Conghua district	Jiangpu	Subtropical hills
	Korla fragrant pear	14	Xinjiang Uygur AR	Bayingolin Mongol AP	Korla city	Awati town	River oasis
	Fengxian pear	15	Jiangsu	Xuzhou city	Fengxian county		River flooding area
Fish and livestock	Apple	16	Jiangsu	Xuzhou city	Fengxian county		Old Yellow River course
	Tan sheep	1	Ningxia Hui AR	Wuzhong city	Yanchi county	Huamachi	River flooding area
	Fish	7	Jilin	Jilin city	Panshi city	-	Thousands of reservoirs and ponds
Root and tuber	Burdock	4	Jiangsu	Xuzhou city	Fengxian county	Fanlou town	River flooding area
	Sweet potato	13	Sichuan	Suining city	Anju district	Baima town	Subtropical hills
	Taro-rice rotation	17	Guangxi Zhuang AR	Guilin city	Lipu city	Xiuren town	Permanent farmland

Note: AR stands for autonomous region. Source: Compiled by FAO based on the respective data papers.

Application of GIES

The GIES methodology can be widely applicable to diverse agroecological zones and products, as summarized in Table 2. Among the products are cash crops, cereals, fruits and vegetables, fish, livestock, roots and tubers that are grown across a variety of agro-ecological zones, such as mountainous or hilly areas, permanent farmlands and river plains.

The products can also be found across wide geographical areas, stretching across the arid climate zone (type B of

Köppen climate classification), the humid subtropical climate (type C) and the humid continental climate (type D).

Conclusion

The GIES tool extends beyond basic scientific research and focuses on ecological natural products by using open science, bridging the science, technology and innovation gaps. The GIES methodology can be widely applied to SAPs irrespective of agroecological zones, as long as they are associated with unique geographical features. It also sheds light on the socio-

cultural values of SAPs. Countries are encouraged to adopt the methodology in their respective contexts.

For more information:

Regional Knowledge Platform on One Country One Priority Product (OCOP) in Asia and the Pacific

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