

Progress of GIES Case Development in Changbai Mountain and Surround Area

WANG Zhenbo LIU Chuang*

Institute of Geographic Science and Natural Resources Research, Chinese Academy of Science, Beijing 100101, China

Abstract: Since the Geographical Indications Environment & Sustainability (GIES) Initiative launched in 2021, the GIES technology was used for supporting environment protection and socio-economic development in Jilin Province of China. The GIES case development from 5 of Panshi City located at the Changbai Mountain area to 15 of 9 counties in Changbai Mt. and around area. These cases involve geographical indications and geographical specific products, including rice, Chinese cherry apples, fish, large corylus, *Ganoderma lucidum*, ginseng, mineral water, *Schisandra Chinensis*, black fungus, and *Pinus Koraiensis* nuts. The Changbai Mt. and surround area is a unique ecosystem in China and the worldwide. The area is designated as the Changbaishan Biosphere Reserve under UNESCO's Man and the Biosphere (MAB) Programme, a National Nature Reserve, and a National Natural Heritage Site. The 15 GIES cases demonstrate an integrated regional approach to conserving the ecological environments of high-quality geographical products and advancing sustainable development.

Keywords: Changbai Mountain; GIES; case group; brand influence; Jilin Province

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1 GIES Cases development in Panshi City of Jilin Province of China

Based on the open science principle and focused on the environment protection and sustainable development, scientists from the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (IGSNRR, CAS), led by Professor LIU Chuang launched the Decade Initiative on GIES (2021–2030) in 2021 (Liu, *et al.*, 2021)^[1]. The Changbai Mt. and surround area was selected to be the demonstration area for the GIES case development. Professor LIU Chuang, FU Jingying, and colleagues conducted field research in Panshi City in 2020 and dialogue with local government officers, famers and private sectors. A common understanding how GIES technology could help Panshi high quality development was made and the Panshi GIES cases began in early 2021. 5 cases were identified in 2021 to 2022, they are: Panshi rice Lanjia Village on permanent basic farmland case^[2–4], Panshi Chinese cherry apple Baoshan Township low mountains and hills case^[5–7], Panshi fishing Qiantang case^[8–10], Panshi large corylus Futai low mountains and hills case^[11–13], and Panshi rice Qiantang case in permanent farmland^[14–16]. The two journals of

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***Corresponding Author:** Liu, C., Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, lchuang@igsnrr.ac.cn

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the Global Change Research Data Publishing and Repository of the World Data System (WDS-GCdataPR) of the International Science Council (ISC), the *Digital Journal of Global Change Data Repository* and the *Journal of Global Change Data & Discovery*, formally published the datasets, video and articles. (Figure 1). Information about GIES Panshi cases were also featured on the FAO website (Figure 2).



Figure 1 Panshi cases published at the *Digital Journal of Global Change Data Repository* (datasets and videos) and *Journal of Global Change Data & Discovery* (articles) (2021)



Figure 2 Group Photo of FAO Delegation in Lanjia Village, Panshi (24/09/2025) (© IGSNRR, CAS/TANG Peixin. Used with permission)

FAO reported about the Panshi cases on FAO website: “Local woman farmer representative Yujun Han shared how the GIES application benefits smallholder farmers, ‘After the GIES project, we established our own brand for cheery apples, and buyers now come directly to us. Our income has tripled’”¹. The successful Panshi cases^[17,18] demonstrate how to balance keeping the environment beautiful and socio-economic sustainable development. Panshi cases attracted more interest to use GIES technology in most of the Changbai Mt. and surround area.

2 GIES Case Development from Panshi City Expanded to Changbai Mt. and Surround Area

February 2024, the Agreement on Framework of Deepening Cooperation between the Governments of Jilin Province and Beijing Municipality was signed. In earlier of 2019, the

¹ FAO. (2024-09-23). <https://www.fao.org/one-country-one-priority-product/asia-pacific/news/detail/asia-pacific-count-ries-strengthen-capacity-in-geo-environmental-traceability-for-special-agricultural-products/en>.

Table 1 List of the GIES cases in Changbai Mt. and surround area

No.	Case No.	Case title	Published date	Location	CSTR	DOI
1	Case 3	Panshi rice Lanjia Village case on permanent basic farmland	2021.06	Lanjia Village, Niuxin Town, Panshi City	20146.22.2021.06.03	10.3974/geodc.2021.05.03
2	Case 6	Panshi Chinese cherry apple Baoshan township low mountains and hills case	2021.12	Baoshan Township, Panshi City	20146.22.2021.12.06	10.3974/geodc.2021.12.06
3	Case 7	Panshi Qiantang (Thousands Reservoirs) fishing case	2021.12	Panshi City	20146.22.2021.12.07	10.3974/geodc.2021.12.07
4	Case 11	Panshi large corylus Futai township low mountains and hills case	2021.12	Futai Town, Panshi City	20146.22.2021.12.11	10.3974/geodc.2021.12.11
5	Case 12	Panshi Qiantang (Thousands Reservoirs) rice in permanent farmland case	2022.05	Panshi City	20146.22.2022.05.12	10.3974/geodc.2022.05.12
6	Case 28	Jiaohe <i>Ganoderma lucidum</i> Changbai Mountains case ^[19]	2025.11	Jiaohe City	20146.22.2025.11.28	10.3974/geodc.2025.11.28
7	Case 30	Hunjiang District <i>Schisandra chinensis</i> Sandaogou Town mountain valleys case ^[20]	2026.02	Sandaogou Town, Hunjiang District	20146.22.2026.02.30	10.3974/geodc.2026.02.30
8	Case 31	Ji'an forest-grown <i>Panax ginseng</i> Huadian Town temperate conifer-broadleaf mixed forest case ^[21]	2026.02	Huadian Town, Ji'an City	20146.22.2026.02.31	10.3974/geodc.2026.02.31
9	Case 32	Wangqing black fungus facility agriculture Jiguan Township mountain valleys case ^[22]	2026.02	Jiguan Township, Wangqing County	20146.22.2026.02.32	10.3974/geodc.2026.02.32
10	Case 33	Helong City wild and forest-grown ginseng Toudao Town temperate mixed coniferous and broad-leaved forest case ^[23]	2026.03	Toudao Town, Helong City	20146.22.2026.03.33	10.3974/geodc.2026.03.33
11	Case 34	Fusong Quanyang mineral water basalt lava forest case ^[24]	2026.03	Quanyang Town, Fusong County	20146.22.2026.03.34	10.3974/geodc.2026.03.34
12	Case 35	Fusong ginseng facility agriculture case ^[25]	2026.03	Fusong County	20146.22.2026.03.35	10.3974/geodc.2026.03.35
13	Case 36	Fusong Korean Pine seeds Lushuihe township forest ecosystem case ^[26]	2026.04	Lushuihe Town, Fusong County	20146.22.2026.04.36	10.3974/geodc.2026.04.36
14	Case 37	Huinan rice permanent basic farmland case ^[27]	2026.04	Huinan County	20146.22.2026.04.37	10.3974/geodc.2026.04.37
15	Case 38	Liuhe rice permanent basic farmland case ^[28]	2026.04	Liuhe County	20146.22.2026.04.38	10.3974/geodc.2026.04.38

In addition, WDS-GCdataPR together with its two journals, the *Digital Journal of Global Change Data Repository* and the *Journal of Global Change Data & Discovery*, participate throughout the review, publication, and dissemination of every case.

4 GIES Technology Supporting Value-Chain Adding by Brand Influence

WDS-GCdataPR at IGSNRR, CAS takes the responsibility to make sure each of the datasets, articles, videos and ground station information safety, accuracy, intellectual right protection and ethical compliance by peer review procedure. Then they are resisted in DOI, WDS-GCdataPR and CSTR systems, which will protect the intellectual property right of the products and their authors before publishing (Table 1). Building on this foundation, WDS-GCdataPR then focused on its services on dissemination. The methods and ways of dissemination include establishing permanent web sets at the WDS-GCdataPR official online platform for each cases, datasets, videos, and articles; building near-real-time GIES ground stations for retrieval origin of the product and its environment; organizing scientific forums; promoting the GIES case products and their practices at major domestic and international fairs (including the Beijing China International Fair for Trade in Services

Table 2 Team composition of the GIES cases in the Changbai Mt. and surround area

Case title	Research institutes	Universities and colleges	Government	Enterprises and farmers	Academic organizations	Partners
Panshi rice Lanjia Village case on permanent basic farmland	1	2	1	3	0	7
Panshi Chinese cherry apple Baoshan township low mountains and hills case	1	2	2	2	0	7
Panshi Qiantang (Thousands Reservoirs) fishing case	2	1	1	2	0	6
Panshi large corylus Futai township low mountains and hills case	3	2	2	3	0	10
Panshi Qiantang (Thousands Reservoirs) rice in permanent farmland case	2	1	18	2	0	23
Jiaohe <i>Ganoderma lucidum</i> Changbai Mountains case ^[19]	2	0	8	6	1	17
Hunjiang District <i>Schisandra chinensis</i> Sandaogou Town mountain valleys case ^[20]	2	1	5	3	0	11
Ji'an forest-grown <i>Panax ginseng</i> Huadian Town temperate conifer-broadleaf mixed forest case ^[21]	1	2	3	4	1	11
Wangqing black fungus facility agriculture Jiguan Township mountain valleys case ^[22]	2	2	4	4	0	12
Helong City wild and forest-grown ginseng Toudao Town temperate mixed coniferous and broad-leaved forest case ^[23]	2	3	7	1	0	13
Fusong Quanyang mineral water basalt lava forest case ^[24]	1	3	4	1	0	9
Fusong ginseng facility agriculture case ^[25]	2	3	7	4	2	18
Fusong Korean Pine seeds Lushuihe township forest ecosystem case ^[26]	1	2	2	1	0	6
Huinan rice permanent basic farmland case ^[27]	2	3	17	4	0	26
Liuhe rice permanent basic farmland case ^[28]	2	3	18	4	0	27
Totle	26	30	99	44	4	203

(CIFTIS), the FAO’s global exhibition From Seeds to Foods, etc.); and showcasing local traditional culture—for example, by working together with the Panshi government for the Winter Fishing Cultural Festival, and introducing the product from Panshi Qiantang (Thousands Reservoirs) fishing case to Beijing consumer community. These activities will benefit farmers increasing income, benefit consumers getting healthy products and benefit environment being kept beautiful.

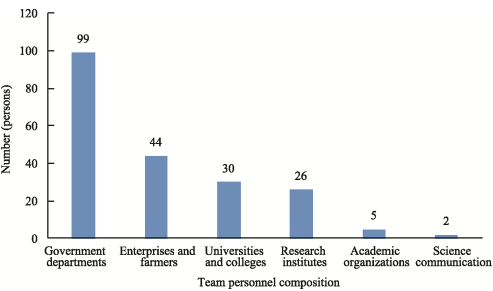


Figure 4 Partners in the GIES cases in the Changbai Mt. and surround area

5 Summary

In February 2023, the quality was recognized to be a key driver of prosperous international trade, industrial development, and improved well-being by the China national development strategy. The Changbai Mt. constitute a distinctive geographical region and a unique ecosystem in China and worldwide. The area is designated as the Changbaishan Biosphere Reserve under UNESCO’s Man and the Biosphere (MAB) Programme, a National Nature Reserve, and a National Natural Heritage Site. The Changbai Mt. and surround area possess an exceptional geographical environment and distinctive high-quality products. On the basis of scientific investigations, we conclude that may more unique, rare, valuable, and high-quality geographical products remain to be developed and promoted in this area.

Examples, such as native Amur grapes (*Vitis amurensis*), sika deer, and the product lines derived from them, which are uncommon in the market yet closely connected with people's livelihoods. The cases introduced to date demonstrate an integrated regional approach to conserving the ecological environments of high-quality geographical products and advancing sustainable development. They also show how the principles of open science and innovation technology could accelerate regional Sustainable Development Goals (SDGs) and matching the Four Betters (Better Production, Better Nutrition, Better Environment and Better Life, and Living No One Behind) of the Food and Agriculture Organization of the United Nations (FAO).

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Conflicts of Interest

The authors declare no conflicts of interest.

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