



Trends of Indigenous Agricultural Development in Taiwan: From “Regaining Indigenous Vitality” to Ecological Sustainability

Cheng-Hua Sun, Ta-Chi Yang

Hualien District Agricultural Research and Extension Station (HDARES), Ministry of
Agriculture, Hualien, Taiwan

*Corresponding e-mail: Cheng-Hua Sun, sunch@hdares.gov.tw

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ABSTRACT

Taiwan’s indigenous regions are rich in biodiversity and cultural heritage, and their agricultural systems embody productive, ecological, and cultural values. In response to the challenges posed by climate change, population aging, and cultural erosion, Taiwan’s Ministry of Agriculture has implemented a program to regain indigenous vitality since 2022. This initiative integrates germplasm conservation and re-cultivation, talent cultivation, ecofriendly farming, value-added industry, and ecological governance to link indigenous agricultural production with environmental conservation efforts. The program facilitates institutional innovation in indigenous agricultural practices. Since its inception, the program has strengthened local germplasm preservation through technological research and development, established 66 participatory conservation sites in collaboration with indigenous communities, and improved crop cultivation and site-appropriate agricultural techniques. The introduction of labor-saving machinery has increased the production efficiency of specialty crops by between 13 and 60 times, and value-added processing technologies for indigenous specialty products have been optimized to develop 59 prototypes through the cultivation of distinctive tribal industries. Moreover, community-based “indigenous vitality schools” have been established, providing training to more than 5,000 local participants. These efforts have grounded technological advances in practice, enhancing agricultural resilience and driving the development of indigenous industries. The present study contextualizes the development of indigenous agricultural practices in Taiwan, synthesizing insights from technological innovation, policy promotion, and community-based practices. This study elucidates how indigenous agricultural practices rooted in traditional knowledge systems have evolved by adopting a model that balances economic development with ecological resilience. Furthermore, this study examines the alignment of this model with the Kunming–Montreal Global Biodiversity Framework and several United Nations Sustainable Development Goals. Finally, this study explored the potential and challenges associated with industrializing, sustaining, and internationalizing indigenous agricultural practices. Taiwan’s experiences and policy insights can serve as a valuable model for advancing indigenous agricultural practices across the Asia–Pacific region.

Keywords: indigenous agriculture, knowledge revitalization, sustainable rural development, eco-agriculture, Taiwan

INTRODUCTION

Taiwan’s indigenous peoples are distributed across 741 tribes and 16 indigenous ethnic groups. Characterized by diverse topographies and complex ecosystems, their communities have developed distinctive agricultural cultures and production wisdom. Such communities are vital habitats for Taiwan’s diverse flora and fauna and repositories of deep-rooted traditional agricultural knowledge systems that have long sustained symbiotic relationships with the natural environment. Indigenous agricultural practices in these regions represent more than a means of food production; they are also a concrete expression of ethnic identity, land-based ethics, and cultural transmission.

Faced with compound challenges from climate change, ecological vulnerability, an exodus of young people, and industrial discontinuity, indigenous agricultural practices have been increasingly marginalized. Traditional farming techniques and ethnic cultural practices are at risk of being eroded. Since the adoption of the United Nations' Sustainable Development Goals (SDGs), the Kunming–Montreal Global Biodiversity Framework (GBF), and ecosystem service governance frameworks, the role of indigenous peoples in biodiversity conservation, local knowledge applications, and climate adaptation has been increasingly recognized. Indigenous agricultural practices are being transformed, shifting from a target of policy support to a critical arena for agricultural innovation and governance resilience.

In response to these trends, Taiwan's Ministry of Agriculture has promoted indigenous agricultural technology programs that integrate strategies such as germplasm conservation and re-cultivation, talent cultivation, ecofriendly farming practices, and community governance. These efforts have involved public–private collaboration and international dialogue. The present study focused on the developmental trajectory of indigenous agricultural practices in Taiwan and outlined the multifaceted progress made in technological research and development (R&D), policy promotion, and local implementation. In examining current conditions and challenges, this study outlined five strategic frameworks and proposed directions for future industrialization and internationalization, documenting Taiwan's practical experiences in promoting the governance and sustainable development of indigenous agricultural practices, which can serve as a model for similar practices elsewhere in the Asia–Pacific region.

The analysis presented in this paper is primarily based on policy implementation experiences, project reports, field observations, and extension outcomes generated under the Ministry of Agriculture's "Regaining Indigenous Vitality" program between 2022 and 2025.

CURRENT STATUS AND CHALLENGES OF INDIGENOUS AGRICULTURE IN TAIWAN

Taiwan's indigenous communities are endowed with abundant natural resources, diverse agricultural ecosystems, and deeply rooted cultural knowledge systems that render them areas of high biological and cultural diversity. Taiwan's 16 recognized indigenous peoples are distributed across 55 townships and 741 tribes, where they engage in distinct forms of agriculture across a variety of terrains, such as mountains, rolling hills, and coastal zones at varying altitudes. These conditions have produced unique systems of traditional farming knowledge (Huang, 2021). The traditional agricultural knowledge of indigenous communities encompasses a profound understanding of land use, ecological governance, and seasonal ritual practices. Such knowledge aligns closely with "Globally Important Agricultural Heritage Systems" as defined by the Food and Agriculture Organization (FAO) of the United Nations. These locally rooted farming systems have long evolved in harmony with the natural environment, embodying adaptive technologies and serving as practical models of the climate-resilient agriculture increasingly called for in global attention. Nevertheless, indigenous agriculture in Taiwan has the potential to innovate industrially, and agritourism products are being developed that integrate farming experiences, cultural interpretation, and creative packaging to advance sustainable agriculture in Taiwan's indigenous communities. Numerous local crops have been processed and transformed to facilitate entry into market distribution channels, and indigenous young people have been encouraged to return to their communities and engage in traditional agricultural practices.

Indigenous agricultural practices face several structural challenges to their continued development. As illustrated in Figure 1, such practices are undergoing a transformative process marked by three phases: regaining indigenous vitality → awakening indigenous vitality → revival of indigenous vitality.

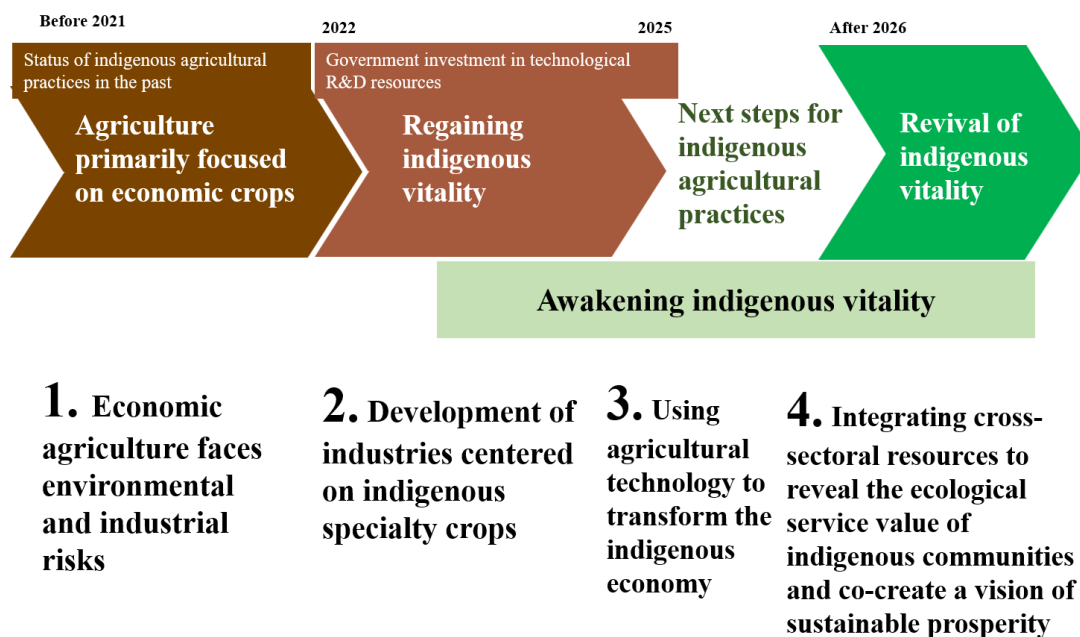


Figure 1. Transformation of indigenous agricultural practices in Taiwan and their sustainable development outlook.

Source: this study

Historically, indigenous agricultural practices in Taiwan have been predominantly centered on the production of economic crops, with development largely focused on an agricultural industry model based on the cultivation of general cash crops. Although rich in biodiversity and indigenous cultural assets, indigenous agricultural industries have gradually declined in the face of multiple structural challenges, such as difficult terrain, limited transportation infrastructure, population aging, and labor shortages, as well as the effects of climate change and industrial discontinuities.

In 2022, Taiwan's Ministry of Agriculture launched its "regaining indigenous vitality" program to drive the transformation of indigenous agricultural practices. The program involves five core dimensions: cultivation of indigenous agricultural talent, participatory germplasm conservation, ecofriendly farming, value-added industry development, and ecological agriculture management. These dimensions directly address the challenges and opportunities associated with the transformation of indigenous agricultural practices. The regaining indigenous vitality program enhances the resilience of agricultural production processes, ensures cultural continuity, and promotes social participation in indigenous communities. The program has shaped a new development paradigm for indigenous agricultural practices and catalyzed the awakening of indigenous vitality. This awakening of vitality prioritizes the preservation and transmission of traditional agricultural knowledge and fosters tribal agricultural systems centered on indigenous specialty crops.

Indigenous agriculture in Taiwan has gradually transitioned toward a revival of vitality. Indigenous communities are bases for food production and play crucial roles in maintaining biodiversity and reducing greenhouse gas emissions. Indigenous communities are the optimal venues for enterprises to practice sustainable development under Environmental, Social, and Governance (ESG) principles. Supporting the development of indigenous agricultural practices also helps preserve local culture and implement the SDGs. For example, in the Tafalong community in Hualien County, enterprises have collaborated with tribal members to revive the Amis indigenous rice varieties Falinono and red glutinous rice. Through contract farming, enterprises support community development and revitalization and have introduced services such as food banks and remote health monitoring to increase the community's living standards and health. In Nantou County's Alang Pulan community, enterprises and the tribe have jointly promoted the preservation of and agricultural education regarding Inago fragrant glutinous rice. Through a stable-price contract farming model, farmers are encouraged to invest in planting and product purchasing. Food and agricultural education is also used to reinforce the next generation's sense of identity with traditional farming culture. Additionally, in the Matadim and Ceroh communities of Hualien County, enterprises encourage farmers to develop ecological farmland by providing funding to construct raptor perches, frog habitats, and vegetation mats, reducing the use of chemical fertilizers and pesticides. These efforts enhance farmland ecology and biodiversity. Enterprises also purchase products

grown through ecofriendly farming practices, supporting the sustainable development of indigenous communities.

These examples of government and enterprises collaborating with indigenous communities integrate private capital and academic research resources, facilitating diverse cooperative efforts in domains such as technology, branding, distribution channels, and education. Such examples are gradually becoming models of policy innovation, supporting the revival of indigenous vitality, sustainable agricultural practices, and multicultural development.



Figure 2. The Ministry of Agriculture collaborates with indigenous communities to promote characteristic agricultural practices and preserve traditional food culture.

Source: this study



Figure 3. The Ministry of Agriculture engages with local indigenous farmers to exchange agricultural techniques and discuss project outcomes in the field.

Source: this study

Advancing the revival of indigenous vitality requires addressing several structural challenges. The agricultural workforce continues to age, motivation for young people to return to their communities and engage in traditional agriculture is low, and risks to knowledge and industry transmission persist. Furthermore, current agricultural systems provide insufficient support for indigenous specialty crops, ecological services, and cultural values and lack incentives for sustainable investment.

The problems Taiwanese indigenous agricultural practices face are also common internationally. According to the FAO (2018), more than 80% of global indigenous communities rely on agriculture, forestry,

fisheries, and livestock for their livelihoods. However, their agricultural systems typically remain marginalized within national policies and lack technical and financial support mechanisms, resulting in institutional exclusion.

In Latin America, countries such as Mexico, Bolivia, and Ecuador have granted indigenous peoples collective governance and production autonomy over agricultural land through constitutional amendments and land reforms. Centered on food sovereignty as the core of development, these initiatives connect agriculture, culture, and national identity (Altieri and Toledo, 2011). In Peru, indigenous communities in the Amazon have developed a tribe-centered “forest garden” (Chakra) system, encouraging crop diversity and coexistence with nature, integrating ecological services, and playing an integral role in biodiversity conservation and climate adaptation (FAO, 2018).

In Southeast Asia, the governments of Thailand and Indonesia have promoted cultural landscape agricultural revitalization programs that support indigenous mountain communities in restoring traditional terraced fields and biodiverse mixed cropping systems. These efforts are linked with ecotourism, education, and markets and have gradually increased the external visibility and economic returns of indigenous agricultural practices. An example of such programs is the community ecological certification mechanism of the Bugis and Toraja communities of South Sulawesi, Indonesia, which incorporates traditional farming techniques into sustainable supply chain management, practices that have attracted international cooperative funding (Simarmata and Stöber, 2019).

Policy developments related to the Sixteenth meeting of the Conference of the Parties (COP16) to the Convention on Biological Diversity such as the GBF have identified “indigenous peoples and local communities” as key actors promoting global biodiversity governance. The COP16 calls on all parties to incorporate indigenous land rights, knowledge systems, and community governance structures into national action plans (Convention on Biological Diversity Secretariat, 2024). This call has also been extended to achieving SDG 2 (zero hunger), SDG 13 (climate action), and SDG 15 (life on land), providing a clear international framework for cooperation and governance in indigenous agricultural practices.

To advance indigenous agriculture toward institutionalized sustainable development, Taiwan must establish multilevel integrated mechanisms involving agricultural production techniques suitable for indigenous community environments, ecological service maintenance, cultural heritage preservation, and agricultural innovation. Only through such methods can Taiwan’s indigenous communities address the multiple challenges of climate crisis, food security, and declining biodiversity.

Compared with indigenous agricultural development models in Latin America and Southeast Asia, Taiwan’s approach places greater emphasis on technological innovation, participatory germplasm conservation, and collaboration among government agencies, research institutions, indigenous communities, and private-sector partners. While Latin American approaches often focus on land rights and food sovereignty, and Southeast Asian models frequently emphasize community-based ecological management and cultural landscapes (Altieri and Toledo, 2011; Simarmata and Stöber, 2019), Taiwan’s model seeks to integrate agricultural technology, biodiversity conservation, and ESG-based partnerships. This integrated approach provides opportunities for agricultural modernization while maintaining indigenous cultural and ecological values.

STRATEGIES FOR IMPLEMENTING SUSTAINABLE INDIGENOUS AGRICULTURAL PRACTICES

Because the indigenous communities in Taiwan are primarily located in mountainous or remote areas, their geographical environment and traditional crop varieties differ considerably from those of general agriculture. Indigenous agricultural practices primarily focus on small-scale farming of diverse specialty economic crops. Agricultural production techniques are principally limited to the primary production stage, and their development is hampered by inconvenient access to transportation and resources. Additionally, mountainous environments are easily affected by weather and natural disasters, rendering agricultural development challenging. From the perspective of ecological conservation, indigenous farming cultures’ traditional respect for nature and ecological adaptation practices contribute to the sustainable development of indigenous communities. Therefore, ensuring food production safety, conserving biodiversity, and preserving tribal farming cultures are policy and strategic priorities.

In response to the expectations of indigenous communities and the demands of ecological environment conservation and national agricultural development, Taiwan’s Ministry of Agriculture has adopted regaining indigenous vitality as its vision. This vision has established foundational germplasm resources and collected

traditional farming data for indigenous agriculture, leveraged technological capacity to assist with local germplasm preservation and use, enhanced site-appropriate crop cultivation techniques, and developed strategies for mitigating conflicts between agriculture and ecology. Moreover, this vision has promoted the integration of tribal agricultural experiences with international standards to establish a model that balances production and ecology, enhances the diverse value of indigenous crops, and develops indigenous agricultural industry chains in which production and ecology coexist.

The regaining indigenous vitality program involves five strategies: (1) indigenous motivation—establishing local knowledge networks and cultivating agricultural talents; (2) indigenous productivity—R&D of agricultural production technologies suited to indigenous ecological environments; (3) indigenous strength—preservation of indigenous specialty crops and establishment of model sites; (4) indigenous creativity—value-added processing, marketing, and industry linkage of agricultural products; and (5) indigenous vitality—development of agricultural landscape management models and payment mechanisms. These strategies prioritize indigenous communities and introduce technologies to advance the integration of and interconnections among tribal agricultural industries, promoting the industrial development of indigenous communities.

The Ministry of Agriculture's regaining indigenous vitality program promotes indigenous agricultural development and the harmonious coexistence of production and ecology in alignment with the United Nations SDGs (Figure 4).

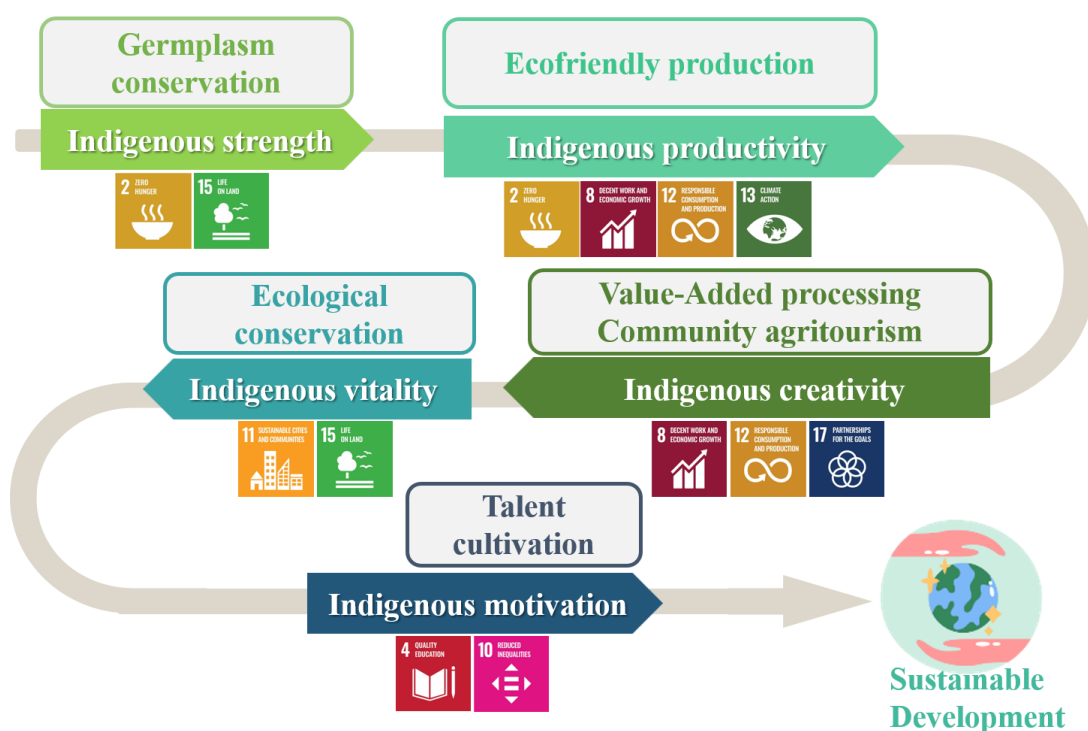


Figure 4. Correspondence between the regaining indigenous vitality program's five core strategies and the United Nations SDGs.

Source: this study

The key quantitative achievements of the program between 2022 and 2025 are summarized in Table 1.

Table 1. Key achievements of the Regaining Indigenous Vitality Program (2022–2025)

Indicator	Achievement
Participatory conservation sites	66
Indigenous germplasm collected	178
Prototype products developed	59
Indigenous vitality school trainees	>5,000
Participating communities	152
Participating indigenous groups	14
Productivity increase through machinery	13–60 times

Source: this study

ACHIEVEMENTS AND HIGHLIGHTS

In response to population outflow from indigenous communities and the environmental risks posed by climate change, the Ministry of Agriculture has promoted sustainable development strategies for the harmonious coexistence of indigenous agricultural production and ecological environments since 2022, with regaining indigenous vitality as its core vision. Through investment in technological R&D, local germplasm preservation has been strengthened and 66 participatory germplasm conservation gardens have been collaboratively established with indigenous communities. Crop cultivation has been enhanced through site-appropriate techniques, and labor-saving machinery has been introduced to increase the production efficiency of crops such as millet, pigeon pea, and Taiwan oil millet by between 13 and 60 times. Simultaneously, value-added processing technologies for agricultural specialty products have been optimized, leading to the development of 59 prototype products and the promotion of tribal specialty industries. Furthermore, more than 5,000 local talents have been cultivated through the establishment of community-based indigenous vitality schools. By grounding technology in practice, these measures have strengthened agricultural resilience, driving development in indigenous industries. Key achievements and highlights of these programs are detailed in the following subsections.

Establishing local knowledge networks and cultivating agricultural talent

To preserve traditional indigenous farming culture and cultivate local talent, community interviews have been conducted to identify community needs and collect data on agricultural and culinary traditions. On the basis of these needs and traditions, indigenous vitality schools have been established to provide systematic training to nurture the diverse talents essential to the development of indigenous industries. Additionally, a digital archive has been developed to store valuable tangible and intangible assets in digital formats. Such digital preservation facilitates the safeguarding, exchange, and transmission of indigenous agricultural knowledge and cultural heritage.

Since 2022, the Ministry of Agriculture has established numerous community-based indigenous vitality schools that have trained more than 5,000 local talents. These schools transmit farming knowledge and promote cultural dialogue and skill transfer between community elders and the younger generation. For example, in the Fakong community, courses on koji (fermentation starter) production and koji plant propagation have helped develop propagation techniques, enhance hygiene and safety awareness in brewing, and revive community interest in brewing culture. Furthermore, the systematic archiving of traditional culture helps preserve ancestral wisdom. These initiatives have enhanced indigenous participation in agriculture and strengthened cultural identity, promoting the intergenerational transmission of indigenous culture.

Relevant SDGs:

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
SDG 10: Reduce inequality within and among countries



Figure 5. Tribal indigenous vitality school conducting a workshop on traditional rice starter culture production and seed preservation.

Source: this study

Indigenous germplasm conservation to maintain food diversity and resilience

To restore lost tribal germplasms and revive traditional culture and seasonal rituals, specialty crop germplasms have been collected and evaluated for germination rates, seedling survival, and agronomic traits. Biotechnology has been employed to overcome challenges such as seedling scarcity and conservation difficulties. Through tribal participation in germplasm preservation, propagation, replanting, and exchange, indigenous local environments and food systems have been reclaimed.

To address disruptions to traditional tribal farming and the rapid loss of precious germplasms, the Ministry of Agriculture has introduced various agricultural conservation technologies. Specialty crop germplasms are restored and continually returned to communities to maintain ecosystem diversity. Through field interviews with tribal elders, numerous local special-use crops and usage habits have been identified, resulting in the collection of 178 germplasm samples. Basic germplasm surveys collecting data on germination rates, seedling survival, and agronomic traits have been conducted, and a germplasm database has been created. Superior germplasms are returned to indigenous communities, which have collaborated with the Ministry to establish 66 traditional specialty crop conservation sites (Figure 6). For example, although millet was once a staple food among indigenous peoples, its cultivation has steadily declined. The Ministry of Agriculture has returned healthy restored seeds to tribal conservation fields, where they have been grown successfully. Observation sessions have also increased farmers' confidence in cultivating millet. With technical guidance from agricultural agencies and tribal participation, traditional rituals and food culture continue to be reclaimed, facilitating agricultural conservation and the preservation of cultural heritage. An increasing number of indigenous specialty crops have been preserved and used, maintaining food diversity and preserving diverse traditional dietary cultures.

Relevant SDGs:

SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

SDG 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss

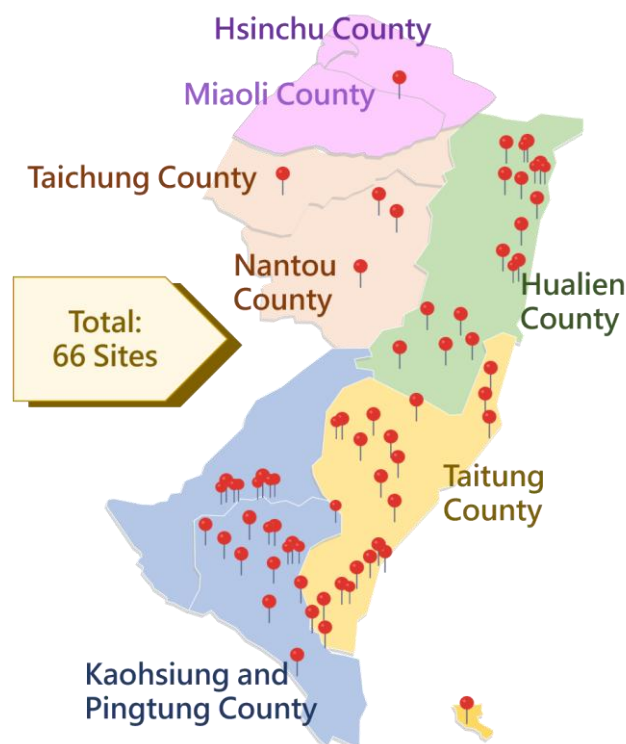


Figure 6. Distribution of participatory crop conservation sites and associated indigenous communities under the regaining indigenous vitality program.

Source: this study

R&D of agricultural production technologies suited to indigenous community environments

Indigenous community farmlands are frequently located in ecologically sensitive areas, posing a considerable challenge to balancing production and ecological conservation. In response, the Ministry of Agriculture has

developed cultivation techniques and economic production models that align with the traditional farming habits of indigenous peoples. These techniques and models have facilitated the development of seedling propagation technologies, research on integrated pest management, and optimized site-appropriate crop production techniques. These measures stabilize the supply of indigenous specialty crop seedlings and provide high-quality seedlings. By adopting organic cultivation management and introducing agricultural machinery, these efforts help increase cultivation area and enhance product quality, promoting the development of indigenous agricultural industries.

On the basis of traditional indigenous dietary culture, value-added processing techniques for indigenous specialty crops have been developed and optimized. Such techniques enhance the safety of traditional risk-prone processing methods, help develop distinctive brand appeal, and assist in the planning of agritourism experiences. Using food, crops, and tourism, these initiatives attract consumers and tourists, channeling external socioeconomic resources into indigenous communities to facilitate the integration of local industries and invigorate community economies.

For example, a 36.4% yield increase in the fire scallion (*Allium macrostemon* Bunge)—much loved by the Amis of the Sililasay community—was achieved by selecting healthy bulbs and applying organic and ecofriendly pest-management techniques. The fire scallion industry has been promoted through collaboration with the Shoufeng Township Farmers' Association in Hualien County. Furthermore, in partnership with the local Yue Mei Primary School, agricultural education on fire scallions has been implemented to increase student awareness of indigenous specialty crop conservation, instilling the values of sustainability in the next generation. Similarly, the cultivation of black millet, a crucial ceremonial crop in the Kungadavane community, has benefited from the introduction of small agricultural machinery for cultivation, which has increased yield and planting area. In collaboration with the Maolin Township Office, the Kungadavane community has launched a short, leisurely black millet-themed tour package to attract tourists.

Relevant SDGs:

SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

SDG 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all

SDG 12: Ensure sustainable consumption and production patterns

SDG 13: Take urgent action to combat climate change and its impacts

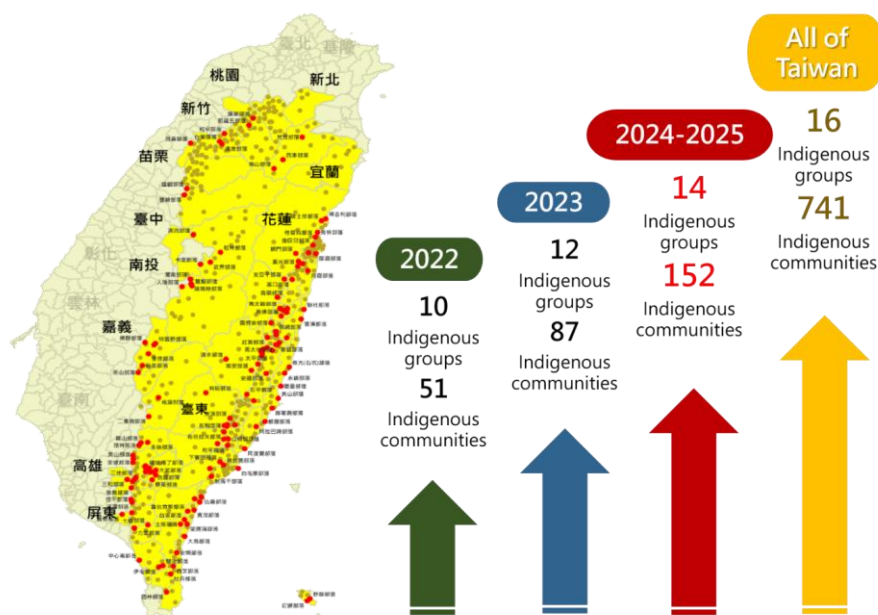


Figure 7 illustrates the rapid expansion of indigenous community participation under the “Regaining Indigenous Vitality” program since its implementation in 2022. The number of participating indigenous groups increased from 10 groups in 2022 to 14 groups in 2024–2025, while the number of participating communities expanded from 51 to 152 during the same period. This trend suggests the effectiveness of integrating germplasm conservation, technology transfer, talent cultivation, and community participation.

Source: this study

The continued expansion of participating communities also suggests that the program provides a practical framework for strengthening agricultural resilience, preserving traditional knowledge, and promoting sustainable rural development. These results provide preliminary evidence of the program's successful implementation and scalability across diverse indigenous regions in Taiwan.

Public-private collaboration to create new paradigms for sustainable indigenous agriculture

Responding to the increasing global emphasis on sustainable governance, indigenous agriculture in Taiwan has gradually transitioned from traditional production-oriented models to models grounded in multifunctional agricultural systems that integrate cultural preservation, ecological services, and social responsibility.

To achieve sustainable development and diversified management in indigenous agricultural practices, the Ministry of Agriculture has launched the regaining indigenous vitality program, which leverages corporate resources to promote various collaborative ESG initiatives in indigenous communities. These projects involve multiple dimensions, such as germplasm conservation, community-friendly contract farming, ecological governance, and cultural education. Through the injection of corporate resources, communities link agricultural product development, brand marketing, and cultural heritage preservation, enhancing value-added benefits and social support networks. This approach enables indigenous agricultural practices to achieve production success and germplasm conservation and enables enterprises to practice corporate social responsibility and green governance.

An example of such corporate-indigenous collaboration is the Tafalong community in Hualien, where enterprises have partnered with indigenous residents to revive culturally meaningful red glutinous rice varieties, supporting farmers through favorable contract farming and purchasing arrangements. This initiative has been expanded through collaborations with food banks for donations and remote health screening services, broadening its social influence. Another example is the Matadim community, where ecological enhancement measures such as raptor perches, frog habitats, and groundcover vegetation have been introduced, creating habitats for black-winged kites, beneficial insects, and other ecofriendly species. These efforts have reduced rodent damage and pesticide use in farmland. Simultaneously, enterprises have purchased ecofriendly products to sell in the form of ESG-branded gift sets, balancing agricultural productivity with biodiversity conservation.

These cases demonstrate the high potential and flexibility of ESG projects integrated with indigenous agricultural practices. Indigenous communities are becoming venues for public-private collaboration, serving as guardians of culture and ecology and as novel paradigms for achieving the double benefits of sustainable agriculture and corporate social responsibility.

Looking ahead, indigenous agriculture can be advanced through a three-pillar framework consisting of ESG project collaboration, ecological compensation mechanisms, and social participation frameworks. This approach can establish a sustainable governance model enriched by cultural value, policy support, and corporate partnership. In alignment with corporate financial disclosure frameworks such as the Global Reporting Initiative Standards, the Task Force on Climate-related Financial Disclosures, and the Taskforce on Nature-related Financial Disclosures, Taiwan's indigenous communities can become leading sites for ESG sustainability practices, enhancing Taiwan's international visibility and contributions to ecosystem services.

To ensure long-term sustainability beyond external investment and short-term ESG initiatives, indigenous communities should continue strengthening local governance capacities, community-based resource management, and indigenous knowledge transmission systems. The development of locally managed agricultural enterprises, tribal branding, and diversified value chains may further enhance economic resilience and reduce dependence on external support. These approaches can help indigenous communities maintain sustainable development while preserving their cultural and ecological foundations.

Relevant SDGs:

SDG 11: Make cities and human settlements inclusive, safe, resilient, and sustainable

SDG 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss



Figure 8. The Ministry of Agriculture and corporate partners promote indigenous ESG sustainable agricultural practices to facilitate cross-sector collaboration and realize their shared vision.

Source: this study

AGRICULTURAL POLICY RECOMMENDATIONS

Taiwan's indigenous communities are vital hubs for food production and play crucial roles in preserving biodiversity, traditional farming knowledge, and cultural heritage. Amid the challenges posed by climate change, these communities demonstrate resilience by sustaining local agricultural production and community support systems. The implementation of the Regaining Indigenous Vitality program since 2022 has contributed to the reconstruction of tribal knowledge systems, the revival of indigenous specialty crops, the revitalization of indigenous communities, and the participation of young people in this revitalization. These achievements align with the goals of sustainable development policies and demonstrate the potential of indigenous agricultural practices to drive agricultural policy innovation.

Three major challenges to translating the successes of pilot projects into institutional norms remain. First, the production, ecological, and cultural functions of indigenous agriculture must be further integrated into agricultural policies and governance systems. Second, although the Ministry of Agriculture has launched the Regaining Indigenous Vitality program and employed a payment for ecosystem services framework, these instruments primarily focus on administrative support and are insufficient to create structural incentives that attract young people to return to their communities and transform indigenous economies. Previous studies have suggested that economic uncertainty, limited employment opportunities, and restricted market access remain major barriers affecting indigenous youth participation in agriculture (Council of Indigenous Peoples, 2022; Huang, 2021). Third, current policies require improvements in brand empowerment, channel integration, and rural entrepreneurship support to meet the new generation of farmers' expectations of self-fulfillment and sustainable enterprises.

In the future, the Ministry of Agriculture will reinforce the foundation of indigenous agricultural development through three strategies: First, the Ministry will continue promoting the development of an industrial structure centered on indigenous specialty crops; second, the Ministry will advance the legalization of the payment for ecosystem services framework to guide corporate resources and social investments in indigenous governance; and third, the Ministry will design an indigenous agricultural innovation acceleration program targeting young people that integrates entrepreneurship coaching, traditional knowledge and cultural transmission, and digital technology. This program will create a hub for indigenous agricultural knowledge and industry development, rendering farming both a viable option for earning a living and a platform for innovative participation and intergenerational dialogue.

Taiwan will continue to promote sustainable development strategies that foster the coexistence and mutual prosperity of indigenous agricultural production practices and the broader environment. By connecting international experience with local wisdom, Taiwan seeks to transform its indigenous agricultural experience

into a model for sharing knowledge of biodiversity, food security, and cultural sustainability that can be employed across the Asia–Pacific region.

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AUTHORS' CONTRIBUTIONS

Cheng-Hua Sun designed the research, collected the data and performed the final paper. Ta-Chi Yang organized the "Regaining indigenous vitality" program.

COMPETING INTERESTS

Cheng-Hua Sun has received research budget from the MOA, Taiwan.