Implementing the Satoyama Initiative for the Benefits of Biodiversity and Human Well-being: Taiwan’s Experience

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ABSTRACT

The Satoyama Initiative was launched in 2010 on the occasion of the 10th meeting of CBD COP, with a goal to realize societies in harmony with nature through revitalization and support of socio-ecological production landscapes and seascapes (SEPLS). In 2015 Taiwan Partnership for the Satoyama Initiative (TPSI) was established as a national multi-stakeholder partnership network to promote the Satoyama Initiative across Taiwan. TPSI Strategic Framework outlined five operational tasks (enhancing international participation and exchange, working on policy research, knowledge enhancement, strengthening capacity building for practitioners, and networking of the on-the-ground activities) which were grouped under two targets (addressing issues of SEPLS and formulating solutions, and conservation and revitalization of SEPLS) and three hierarchical concepts of “think global,” “adapt national” and, “act local.” This paper, firstly, depicts the Satoyama Initiative in global and Taiwan’s contexts; secondly, it elucidates institutionalization, development and implementation outcomes of TPSI over the 2014-2019 period; thirdly, the paper proposes outlooks for the future of the Satoyama Initiative at the local, national and global scales.

Keywords: The Satoyama Initiative, agro-biodiversity, livelihood, IPSI, TPSI

[For the List of Abbreviations please refer to Appendix C]

INTRODUCTION: THE SATOYAMA INITIATIVE AND THE GLOBAL SOCIAL-ECOLOGICAL CRISIS

Our patterns of growth since the Industrial Revolution and all the way through the 20th century have successfully paved a way for the alienation of man from nature. It was in “The Limits to Growth” report (Meadows et al., 1972) that the long-predicted biophysical impossibility to sustain our current growth patterns on a finite planet was first officially proclaimed. Rockström et al. (2009) took this notion further to warn the international community that two out of nine planetary boundaries – biodiversity loss and disruption of nitrogen cycle – have already surpassed their safe operating space for humanity with others at a high risk of being crossed. The latest IPBES Global Assessment Report on Biodiversity and Ecosystem Services published in May 2019 found that changes in land and sea use are the primary direct drivers of changes in nature with “75% of the land-based environment and 66% of the marine environment having been significantly altered by human actions” (Díaz et al., 2019). Clearly, decoupling of social and ecological systems from local to global levels (Takeuchi et al., 2016), prompted further by economic, socio-political and technological forces, rests at the core of current
Recent studies suggest that broadly applied “human-nature” divide in conservation approach is losing its ground due to the recognized interlinkage between culture and nature (Gu et al., 2014, Mora and Sale, 2011) and a crucial role of well-balanced human activities in protecting nature from its over-use or under-use (Takeuchi et al., 2016, Berkes and Folke, 1994). Remarkably, as suggested in the IPBES Global Report (2019), human-induced alterations to land-based and marine environment have been “less severe or avoided in areas held or managed by indigenous peoples and local communities.” Hence, based on the wisdom of traditional societies and supported by a strong evidence of modern science, the indivisible relationship between people and nature should be viewed in the light of social-ecological systems and by allowing societies a larger role in modern-day biodiversity conservation and sustainable resource use (Gu and Subramanian, 2014).

Thus, in 2010 at the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) the Satoyama Initiative and the International Partnership for the Satoyama Initiative (IPSI, https://satoyama-initiative.org/) were jointly launched by the Ministry of the Environment, Japan, and the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS). Paris Declaration of the Satoyama Initiative (2010) proclaimed its overall objective as “promotion and support of socio-ecological production landscapes and maintaining their contribution to human well-being and the objectives of the CBD.”

The Satoyama Initiative features Japanese term “satoyama” ("sato" meaning “settlement” and “yama” – “uplands”, “mountains”) to refer to mosaic landscapes of woodlands, paddy fields, grasslands, irrigation canals, and human settlements, which were traditionally sustainably managed by its inhabitants (Takeuchi, 2010). As these satoyama-like landscapes exist in different parts of the world (Berglund et al., 2014) and represent such diverse eco-systems as forest, grassland, agricultural, inland water, coastal, dryland, mountain, urban/peri-urban, etc. (Takeuchi, 2019), they are often referred to as socio-ecological production landscapes and seascapes (SEPLS) (Gu and Subramanian, 2014).

By definition, SEPLS are the “landscapes that have formed as a consequence of human habitation and activities such as agriculture and forestry (and fishery) over many years and include both the bounty of nature and various ecosystem services” (Paris Declaration of the Satoyama Initiative, 2010). In the past, SEPLS provided goods and services to support human livelihoods (firewood, food, daily commodities), while people’s dependence on natural resources prompted them to treat nature with respect and use its resources in a balanced and sustainable manner. A reciprocal relationship between people and nature in SEPLS was in many ways not only harmonious in nature, but also circular (e.g. agricultural and human wastes were used as a fertilizer to the fields) and low-carbon with firewood being collected from woodlands, production and consumption being localized (Takeuchi, 2010).

Nowadays, due to direct (land-use change, climate change, invasive species, pollution, over-exploitation and under-use of resources) and indirect (demographic, economic, cultural, socio-political, and technological) drivers of change (JSSA, 2010), many SEPLS all around the world are diminishing or disappearing (IPSI Plan of Action 2013-2020). In impoverished societies with a high demand for fuel and food, the over-use of natural resources becomes a common practice, while in other parts of the world industrialization, urbanization, aging, and depopulation result in the under-use of natural resources (Nature Conservation Bureau, 2010). Either scenario is detrimental in its effects to the biodiversity and human well-being.

Under these circumstances, in order to realize its goal of societies in harmony with nature through revitalization and support of SEPLS, the Satoyama Initiative proposed a three-fold approach and six perspectives (https://satoyama-initiative.org/). The three-fold approach includes a) consolidation of wisdom on a stable supply of ecosystem services; b) integration of traditional knowledge with modern science; c) exploring new forms of co-management systems (or “new” commons). In the meanwhile, six perspectives of the Initiative include: resource use within the carrying capacity of the environment, cyclic use of natural resources, recognition of the value and importance of local traditions and cultures, multi-stakeholder participation and collaboration, contributions to socio-economies, and improved community resilience (IPSI Secretariat, 2017).

IPSI itself acts as a global platform on promotion of networking, collaboration and research related to SEPLS and contributing to the CBD processes (IPSI Plan of Action 2013-2020). It is
currently comprised of 253 members from five continents (as of May 2019) including local and national governments, NGOs and NPOs, indigenous and local organizations, academic, educational and research institutions, as well as private entities (Takeuchi, 2019). IPSI knowledge sharing activities are represented by annual Global IPSI Conferences and Regional Workshops, while capacity building collaborative activities include the Satoyama Development Mechanism (SDM) (https://www.iges.or.jp/en/natural-resource/bd/sdm.html), GEF-Satoyama Project (http://gef-satoyama.net/), SEPLS Resilience Indicators Toolkit (https://www.bioversityinternational.org), and the Satoyama Initiative Thematic Review (SITR) (https://pub.iges.or.jp/pub/bv/series/satoyama-initiative-thematic-review). Importantly, collection and sharing of the case studies provided by IPSI members (172 case studies as of January 2019) have become a valuable tool in addressing all four of IPSI Strategic Objectives: (1) Increasing knowledge and understanding of SEPLS, (2) Addressing the direct and underlying causes, (3) Enhancing benefits, (4) Enhancing capacities (IPSI Plan of Action 2013-2020).

A palpable role of the Satoyama Initiative in bridging the “human-nature” divide may be viewed through the prism of its contributions to achieving Aichi Biodiversity Targets (ABTs, https://www.cbd.int/sp/targets/) of the CBD and Sustainable Development Goals (SDGs, https://sustainabledevelopment.un.org/). Accordingly, the Initiative mainly addresses ABT #7 (Sustainable agriculture, aquaculture and forestry), #19 (Knowledge and technology), #1 (Awareness of biodiversity), #18 (Traditional knowledge), #11 (Protected areas & OECMs1), #14 (Ecosystem services), #5 (Habitat), and #4 (Sustainable production and consumption) (Takeuchi, 2019; Takahashi, 2019). At the same time, main SDGs currently addressed by IPSI case studies include SDG #12 (Responsible consumption and production), #15 (Life on land), #2 (Zero hunger), #8 (Decent work and economic growth) and #1 (No poverty), while socially and ecologically sound activities under the Initiative also have a high potential to contribute to SDG #6 (Clean water and sanitation), #11 (Sustainable cities and communities), and #14 (Life below water). Notably, ABTs and SDGs not mentioned above are highly likely to be addressed indirectly in current or future case studies (Takeuchi 2014, 2019).

All in all, for almost a decade now IPSI has been striving towards mending the relationship between humans and nature by building a cross-scale, connected and coupled social-ecological system (Takeuchi et al., 2016). In order to promote sustainable societies living within the carrying capacity of our planet, the Satoyama Initiative has been facilitating discussions across various knowledge systems (traditional and modern knowledge), disciplines (natural and social sciences), and scales – at global, regional, national, and local levels. In this regard, national networks for realization of the Satoyama Initiative play a crucial role in a nation-wide revitalization of SEPLS, achievement of ABTs and SDGs, as well as communicating knowledge, lessons and experiences to the international level. Taiwan Partnership for the Satoyama Initiative (TPSI) – the second national network after Japan’s – presents a vibrant story of success with its diverse member representation, growing number of participants, and a wide range of frequent and comprehensive collaborative activities. Thus, promotion of the Satoyama Initiative in Taiwan is the subject of the following chapters.

THE SATOYAMA INITIATIVE IN TAIWAN’S CONTEXT

Taiwan is a small island with a high population density of average 649 people/km2, making it the 17th most densely populated country in the world (World Population Review, 2019). The middle and lower reaches of the island are mainly occupied with rural and urban areas. Eighty percent (80%) of the population is concentrated in urban areas which cover only 13% of Taiwan’s total land, while natural and rural areas take up 58% and 29% respectively (Lee, 2016). Known as one of Four Asian Tigers, starting from mid-1960s, Taiwan experienced an unprecedented industrial development and economic growth, which resulted in its present-day high levels of urbanization, widespread practice of conventional agriculture, and substantial land use changes. Not surprisingly, rural areas took it the hardest with rural depopulation and aging, deterioration of production landscapes, economic depression, loss of traditional ethics and culture, disintegration of rural communities (Chung et al., 2018) being just few out of many challenges at the forefront of Taiwan’s social-ecological crisis.

In the past, similar to satoyama in Japan and SEPLS in other areas of the world, livelihoods of local and indigenous communities in Taiwan also depended on environmentally friendly agriculture (rice paddies and dry crops), forestry, fishery, livestock farming, hunting, and gathering. In many ways,
Intergenerational knowledge transfer was a key factor to ensure the balance between over-use and under-use of natural resources within the carrying capacity of social-ecological systems. When it was disrupted by the socio-economic changes of the past few decades, the agricultural production landscape stopped being maintained as it once was while environmental decline and biodiversity loss were on the rise.

Therefore, soil erosion, water pollution and shrinking biodiversity rates from the prevalent use of pesticides, herbicides and chemical fertilizers on the farms became an inevitable consequence of aging and depopulation in the rural areas (Yang, 2014). At the same time, under-use of forest resources led to species dependent on human maintenance of the secondary natural environment, such as African grass owl, leopard cat, Chinese box turtle, John’s frog, paradise fish, crab-eating mongoose, greater painted-snipe, and pangolin, becoming in danger of extinction. Instead, SEPLS today are faced with rapidly expanding populations of wild deer, boar and monkeys that cause severe damages to agriculture, forestry and livelihoods of rural communities.

Notably, comparable to the above-stated global trends (Gu et al., 2014, Mora and Sale, 2011), for Taiwan it also became clear that the traditionally practiced protected areas conservation approach to tackle biodiversity loss had proved to be inefficient in resolving the “human-nature” divide (Lu et al., 2010). One of its main drawbacks was the failure to recognize the role of man-managed agricultural landscapes in biodiversity conservation and environmental protection. In other words, connection among forests, rivers, human settlements, and seas in natural and rural areas of Taiwan faced the need of integrated – social-ecological – approaches to conservation, revitalization and sustainability. Such urgency highlighted the potential of conservation and revitalization of Taiwan’s SEPLS to enhance the reciprocal exchange between rural and urban areas as well as restore the key role of rural areas in linking natural and urban areas in Taiwan (Lee, 2017).

Thus, introduction of the Satoyama Initiative to Taiwan in late 2010 became a timely and much anticipated solution to the revival of Taiwan’s SEPLS. Clarity of the satoyama (里山) concept to the Taiwanese people, its social-ecological systems thinking similar to that of local and indigenous communities, historically and culturally close bond with Japan as well as comparable with it socio-ecological threats and agricultural patterns were some of the main factors that paved a way for the Satoyama Initiative to be widely welcomed both by Taiwan’s government and the general public. From 2011 to 2014 practices engaging in conservation and revitalization of SEPLS were on the rise in Taiwan and four organizations joined IPSI (see Appendix A): National Dong-Hwa University (NDHU, 2011), Taiwan Society for Wildlife and Nature (SWAN, 2012), Taiwan Ecological Engineering Development Foundation (EEF, 2013), and Environmental Ethics Foundation of Taiwan (EEFT, 2014). Remarkably, from early on, the Forestry Bureau of Taiwan Council of Agriculture became engaged with universities, NPOs and local communities in ecological restoration of rice terraces and wetlands in the name of the Satoyama Initiative.

As a result, having been introduced to Taiwan via different channels and having incited a great interest from the governmental, academic and social circles, the Satoyama Initiative was also facing some substantial challenges in its nation-wide promotion (Lee, 2014; Hsia et al., 2015). These challenges included:

1) **The need for a comprehensive policy and strategic planning** to connect at time scattered satoyama-related activities across various themes, localities and stakeholders under the guidance of a government institution to strategically promote the Satoyama initiative nation-wide;

2) **The need for knowledge enhancement and academic studies** to elicit a comprehensive analysis and discussions of domestic on-the-ground activities as well as to channel Taiwan’s experiences internationally;

3) **The need for a capacity building mechanism** to organize workshops and other kinds of training courses to the practitioners engaged in on-the-ground satoyama-related activities to facilitate mutual learning and exchange of experience;

4) **The need for good practices in line with the three-fold approach of the Satoyama Initiative** in the form of analytical reports on detailed planning processes, management frameworks and
implementation outcomes that can be shared with international and domestic audiences.

Clearly, dealing with the obstacles above required an integrated and multi-stakeholder approach to setting up a national strategic framework for promoting the Satoyama Initiative. Thus, in 2014, with these challenges in mind and learning from IPSI experiences, the Forestry Bureau began working with NDHU on development of Taiwan Partnership for the Satoyama Initiative (TPSI).

INSTITUTIONALIZATION OF TPSI

The first draft of the National Strategic Framework for Promoting the Satoyama Initiative in Taiwan was proposed by NDHU in 2014 and the revised comprehensive TPSI Strategic Framework was adopted by the Forestry Bureau in 2015. The overarching goal of TPSI was set to build up a national multi-stakeholder partnership network in which stakeholders could consolidate their complementary strengths, resources, assets and knowledge for solving problems in a holistic and synergistic manner (Hsia et al., 2015). The objective of TPSI is to work with IPSI on implementation of activities under the Satoyama Initiative nation-wide (Figure 1).

![Image of strategic framework]

Figure 1. Relationship between the Satoyama Initiative, IPSI and TPSI (revised from IPSI Strategy, 2012)

The initial draft of the Strategic Framework outlined five aspects of TPSI activities, which included enhancing international participation and exchange, working on policy research and strategic framework, facilitating knowledge of indicators for monitoring, strengthening capacity building, and knowledge exchange through regional on-the-ground networking. Later these activities were reflected in five operational tasks grouped under two targets and three hierarchical concepts as presented in the final version of TPSI Strategic Framework (Figure 2).
Notably, design of the strategic targets and goals for TPSI specifically focused on the challenges faced by the advancement of the Satoyama Initiative on Taiwan’s soil, as outlined in the previous chapter. Hence, the first target of “Addressing issues of SEPLS and formulating solutions” embraces “think global” and “adapt national” strategic concepts. Three task activities related to the first target include enhancing international participation and exchange (under the “think global” concept), as well as working on policy research and facilitating knowledge enhancement (under the “adapt national” concept). In the meanwhile, the second target reflective of the “act local” concept is aimed at “Conservation and revitalization of SEPLS”. Two task activities under this particular target are strengthening capacity building for on-the-ground practitioners and relevant government institutions, as well as networking of the on-the-ground activities.

Key stakeholders involved in the implementation of TPSI from 2014-2019 include the project supporter, project coordinator, Taiwan’s 14 IPSI members and non-IPSI members. Thus, Forestry Bureau of Taiwan Council of Agriculture is the project supporter as well as the key policy-making authority responsible for promoting the Satoyama Initiative in Taiwan. NDHU acts as the project leader and coordinator. Fourteen of Taiwan’s IPSI members (as of July 2019, see Appendix A for the full list of members) are represented by the government (4 members), NGOs/ NPOs (7 members) and academia (3 members). Non-IPSI members include other organizations and local practitioners from the northern (TPSI-N), western (TPSI-W), southern (TPSI-S), and eastern (TPSI-E) parts of Taiwan (Figure 3) which participate and share their on-the-ground experiences at TPSI conferences and workshops.
IMPLEMENTATION OF TPSI

Overall implementation of TPSI to date may be divided into two main stages: (1) the pilot implementation phase of 2014-2015 when NDHU was commissioned by the Forestry Bureau to conduct the first two-year Pilot Project and (2) the extension implementation phases: of 2016-2017, when the Forestry Bureau and NDHU partnered to implement the second two-year Extension Project, and of 2018-2020 (ongoing) set forth by the “Program on Deepening TPSI Communication”. Accordingly, summary of the activities and outcomes of TPSI implementation is presented below following the order of their developmental phases and reflective of operational tasks and hierarchical concepts of TPSI Strategic Framework.

I. Pilot phase for TPSI development, 2014-2015

Prior to TPSI Strategic Framework being officially adopted by the Forestry Bureau in 2015, NDHU ensured introduction of the Satoyama Initiative, IPSI and the concept of ecoagriculture at the national level in 2014. “Assistance in establishment of Taiwan Partnership for the Satoyama Initiative (TPSI)” as a partnership project between NDHU and the Forestry Bureau was submitted to IPSI in 2015.

Further, leading the way in Taiwan’s engagement in the Satoyama Initiative, NDHU submitted a case study report to IPSI titled “Society – Ecology – Production Landscape coordination, planning and management: Conservation of a rice paddy cultural landscape in an indigenous community, Taiwan”, as well as two TPSI reports: “Development process of the narrator training course in Pakalongay Village, Hualien County, Taiwan” and “Knowledge and use of Amis indigenous plants in Fuxing Tribe, Sinshe Village, Hualien County, Taiwan.” Also, to encourage experience sharing from other TPSI members, NDHU hosted the Satoyama Initiative Case Study Report Workshop for on-the-ground practitioners on May 28-29th, 2015.
Later in 2015, the First International Conference on Ecoagriculture and the Satoyama Initiative, held in Hualien, Taiwan, on September 23-24th, 2015 became a milestone in taking _satoyama_ concept to a new level of biodiversity conservation and revitalization of rural areas in Taiwan. The conference was co-convened by Hualien District Agricultural Research and Extension Station (HDARES) and the Forestry Bureau with the support from NDHU and SWAN. Remarkably, it was the first time when Taiwan’s agricultural and nature conservation sectors set out to work together on the new concepts and approaches of ecoagriculture and the Satoyama Initiative.

II. Extension phases for TPSI development, 2016-2017 and 2018-2020 (ongoing)

In May 2016, promotion of the Satoyama Initiative in Taiwan became a new ministerial policy announced by the new Minister of Taiwan Council of Agriculture and followed by the new Director General of the Forestry Bureau, Council of Agriculture since July 2016. In 2018, after the initial four years of TPSI development (2014-2017), the 2018-2020 “Deepening TPSI Communication Program” was introduced. It determined the following goals: (1) continuing to promote five operational tasks under TPSI Strategic Framework, namely: international participation, policy research, knowledge enhancement, capacity development, and on-the-ground activities; (2) promoting TPSI with the help of eight district offices under the Forestry Bureau to facilitate the “capacity building and on-the-ground practices” objective nation-wide; (3) integrating and supporting promulgation of the “2018-2021 National Green Network.”

“Act local”: capacity building and on-the-ground activities

In 2016, four regional networks (TPSI-N, TPSI-W, TPSI-S, TPSI-E) were established for regional capacity building and nation-wide exchange of on-the-ground experiences with other practitioners. Since then, conducting one- or two-day Regional Workshops arranged by each of the regional networks throughout the year (a total of four workshops per year) became a tradition bringing together diverse participants from local community organizations, government institutions, NPOs/NGOs, and academia.

Details of the Regional Workshops from 2016 to 2018, including the number of participants and organizations, specific dates and locations, are presented in Appendix B, while Figure 4 and Figure 5 demonstrate the overall increasing trend over the three-year period. Precisely, a total of 102 organizations and 173 participants took part in the workshops in 2018 as compared to 42 and 63 in 2016. Also, the number of participating units in each participant category grew in 2018 in contrast to 2016: 52 to 11 for NGOs/NPOs, 38 to 8 for communities, 27 to 8 for government agencies, 8 to 4 for the academic institutions. Curiously though, representation ratio of the participant categories showed a shift towards a greater number of NGO/NPOs and community members (35% and 26% in 2016 against 42% and 30% in 2018, respectively) at the expense of involvement from the government and academic institutions (26% and 13% in 2016 against 22% and 6% in 2018) (Figure 6). Though specific reasons for such a representation ratio swing deserve further analysis, one of the explanations falls in line with Professor Takeuchi’s (2019) statement that the Satoyama Initiative is proving successful in “mainstreaming” biodiversity to a wider audience – in this case, the audience not limited to the government agencies and academia.
Figure 4. Number of participants and organizations who participated in TPSI Regional Workshops from 2016 to 2018.

Figure 5. Expansion of participants in TPSI Regional Workshops from 2016 to 2018.

Figure 6. Comparative annual representation ratio of four participant categories in TPSI Regional Workshops in 2016 and 2018.
Furthermore, in 2018, during the first year of 2018-2020 “Deepening TPSI Communication Program”, expansion of communication and exchanges between northern, western, southern and eastern regions of TPSI continued when the Forest Bureau and NDHU invited three more institutions – Dharma Drum Institute of Liberal Arts (DILA), Endemic Species Research Institute of Taiwan Council of Agriculture (TESRI) and National Pingtung University of Science and Technology (NPUST) – to act as exchange bases for the TPSI-N, TPSI-W and TPSI-S, respectively. NDHU was to remain the base for coordinating TPSI-E exchange activities.

“Capacity building Workshops on Promotion of TPSI” are another type of capacity building activities designed specifically for the administrative staffs from the Forestry Bureau headquarters and its eight district offices. Thus, in August 2016 and May 2017 a total of 55 and 20 personnel attended the Workshops, while a decrease in the number of participants may be explained by the staffs’ improved familiarity with the Satoyama Initiative.

The first-time national scale “TPSI-all Workshop on Review and Outlook of TPSI Development” was organized by NDHU in cooperation with the Chinese Society for Environmental Education (CSEE) and took place at the National Museum of Natural Science, Taichung on September 15th, 2017. It brought together representatives from different government institutions, NGOs/ NPOs, community organizations, academic/ educational institutions and citizens – a total of 150 participants for the morning symposium and 50 participants for the afternoon workshop. TPSI-all helped the participants from four different regional networks to learn the origin, process and progress of the Satoyama Initiative in Taiwan, as well as discuss challenges and strategies of TPSI development in recent years and for the future.


“Adapt national”: policy-research and knowledge enhancement activities

Throughout 2016-2017, TPSI was putting effort into completing a cross-domain governance discussion of establishing a “Forest-River-Village-Sea” green conservation network guided by the principles of the Satoyama Initiative and eco-agriculture, while in May 2018 the “2018-2021 National Green Network” was officially adopted by Taiwan Council of Agriculture. The document directly addressed the first challenge of promoting satoyama in Taiwan (“The need for a comprehensive policy and strategic planning”) and highlighted a fundamental role that SEPLS play in biodiversity conservation through promotion of sustainable agricultural practices and revival of rural communities. Notably, the “National Green Network” marked a shift from traditional protected areas conservation approach towards the one based on recognizing rural areas as a link for restoring the balance between natural and urban systems in Taiwan (the Forestry Bureau, 2018).

Later in July and October of 2018, NDHU assisted the Forest Bureau in conducting two workshops on “Promotion and Strategy for Integration of the Satoyama Initiative into the ‘National Green Network,” which took place in Chiayi and Hsinchu District Offices of the Forestry Bureau, respectively. In December 2018, the Forestry Bureau and its eight district offices were invited by NDHU to participate in IPSI-TPSI Workshop on Case Study Report Writing. The main aim of the Workshop was to encourage the district offices to submit their outstanding case studies to the Satoyama Initiative webpage of the Forestry Bureau website and to the IPSI website.

As a strong tool for the nation-wide knowledge enhancement and exchange, TPSI website, proposed by the Forestry Bureau and inspired by the IPSI website, is currently under construction. Most recent activities in 2018-2019 include completion of SEPLS analysis for each of four TPSI regions and collection of initial proposals on integrating the Satoyama Initiative into the “National Green Network.”
Finally, national policy research and knowledge exchange from 2016 onwards benefited greatly from the participation of Taiwan’s IPSI members in such collaborative activities as the SDM and SITR.

The SDM is a financing mechanism established jointly by IGES, UNU-IAS, and the Ministry of the Environment of Japan (MOEJ) in 2013. Its main goals are incentivizing IPSI members to implement activities under IPSI Strategy and Plan of Action, to develop model practices for living in harmony with nature, and to strengthen partnerships and joint activities (SDM, 2019). The maximum amount of the SDM funding is USD 10,000 and the maximum funding time period is 12 months. As shown in Appendix A, projects realized by NDHU (2014, 2016), SWAN (2013) and HDARES (2017) were awarded the SDM funding as at the time they were “deemed the most promising for the implementation and promotion of the concept of the Satoyama Initiative” (SDM, 2019).

The SITR is a series of annual publications that have been managed and edited by UNU-IAS and IGES since 2015 (five volumes as of 2019). Under yearly publication themes it brings together on-the-ground experiences of the Satoyama Initiative in SEPLS from all over the world to be shared with other IPSI members and a wider audience. To date, Taiwan’s representation in each of the SITR volumes has been ensured by NDHU (2016, 2019), SWAN (2015, 2018) and HDARES (2017) with a high potential of other IPSI members (Appendix A) to contribute their case study experiences to future publications.

“Think global”: international participation activities

Participation in international activities related to the Satoyama Initiative is crucial for successfully addressing the challenges faced by Taiwan’s SEPLS and formulating viable solutions (Target 1 of TPSI Strategic Framework). Hence, from early on, TPSI members were encouraged to engage in international exchanges both in Taiwan and outside of the country. Over the years of TPSI implementation, a balance has been kept between attending international satoyama-related activities by TPSI members and invitation of foreign researchers and practitioners to Taiwan.

Thus, to name just a few Global IPSI Conferences and Regional Workshops attended by TPSI members, such include: the 6th Global Conference of the International Partnership for the Satoyama Initiative (IPSI-6) in Siem Reap, Cambodia (January 2016), Satoyama Initiative Regional Workshop in Sabah, Malaysia (April 2017), and the 7th International Partnership for the Satoyama Initiative Global Conference (IPSI-7) in Kanazawa, Japan (September-October 2018). At each of these events NDHU presented achievements and outcomes of TPSI development in order to facilitate the knowledge exchange with a wider international audience – both regionally and globally.

Furthermore, one of the first TPSI international activities within Taiwan took place in October 2016 when NDHU assisted the Forestry Bureau in inviting Mr. Kazuaki Nagano from MOEJ and Mr. Toru Hayami from the Hayami Forest to share their experience and expertise in revitalization policies of Japan’s satoyama and satochi areas, as well as their sustainable forestry practices in the first area certified by the Forest Stewardship Council (FSC).

A year later, in November 2017, NDHU and the Forestry Bureau invited Mr. Naoya Tsukamoto and Ms. Evonne Yiu from UNU-IAS to give speeches in the morning symposium session on “IPSI-TPSI Exchange” and “Satoumi Initiative in Japan”, as well as to take part in the afternoon workshop on “Youth Participation in TPSI Development” with young satoyama practitioners from all four regional networks of TPSI. With a wide participation of 202 representatives from 35 government institutions, 60 from NGOs/ NPOs and community organizations, 21 from academic/ educational institutions and 24 citizens, the events were not only a chance for the wider audience to learn firsthand about the Satoyama Initiative, but also helped to inform IPSI Secretary about the progress of both the Satoyama Initiative and TPSI development in Taiwan.

Most recently, in July 2018, the team of four people under the guidance of Professor Da-Yuan Xue from the School of Life and Environmental Sciences of Minzu University of China was invited to come to Taiwan for exchange. The program was comprised of a four-day area study of Taiwan’s East Coast (Hualien and Taitung Counties) and a one-day “Cross-strait Exchange Forum on Conservation and Governance of Agro-biodiversity” that was held on July 6th, 2018 at NDHU. A total of 72 people participated in the Forum: 17 representatives from eight government institutions, 20 from 19 units of community and civil society organizations, 26 from seven academic institutions, and nine individual
Success rate of TPSI implementation may be discerned from the way its actions managed to address the four major challenges to promotion of the Satoyama Initiative in Taiwan that were outlined earlier in this paper. As the first target of TPSI Strategic Framework focused on such challenges as “The need for a comprehensive policy and strategic planning” and “The need for knowledge enhancement and academic studies,” and the second target – on “The need for a capacity building mechanism” and “The need for good practices in line with the three-fold approach of the Satoyama Initiative,” it may be observed how locally, nationally and globally-minded strategic activities of TPSI have been paving a way for the Satoyama Initiative to be rooted deeper in Taiwan’s context. Within five years, these “think global,” “adapt national” and “act local” activities have not only been happening simultaneously and cross-complimenting each other, but also managed to attract a growing number of participants with a wide range of representation.

“Act local” concept has been being realized through two main types of events: capacity building workshops for government officials and regional networking activities of TPSI (TPSI-N, TPSI-W, TPSI-S and TPSI-E). Specialized workshops and conferences proved successful in bringing the concepts of ecoagriculture and the Satoyama Initiative into the discourse between Taiwan’s agricultural (e.g. HDARES) and nature conservation sectors (e.g. the Forestry Bureau and its district offices), as well as stimulating discussions within each government agency. At the same time, field trips, keynote speeches, and on-the-ground experience sharing that have been taking place at the regional TPSI events have been providing unique opportunities for interaction and cooperation across different levels, sectors and localities to further strengthen TPSI network. In the future, comprehensive analysis of feedback surveys collected from the participants along with enhanced information and resource sharing techniques are expected to strengthen the “act local” component even further.

Policy research and knowledge enhancement under the “adapt national” concept have been primarily focused on preparation and integration of the Satoyama Initiative into the “2018-2020 National Green Network” to foster a new, social-ecological, type of conservation approach nation-wide. TPSI’s imperative role in this process may be viewed from the following angles. Firstly, grassroots regional networks of TPSI including community members (among them indigenous communities), on-the-ground practitioners (as well as narrow specialists), local government officials, NGOs/ NPOs and academia are most aware of specific SEPLS issues in their region and can contribute case-studies to reflect such. Secondly, nation-wide network character of TPSI can ensure the “no area left behind” approach when achieving objectives of the “National Green Network”, while providing the bottom-up support to the national policy. Thirdly, in the near future, TPSI website that is currently being developed by TPSI technical support unit will be able to widely “mainstream” the Satoyama Initiative in Taiwan and promote its benefits for biodiversity and human well-being.

Knowledge-sharing by TPSI members at annual Global IPSI Conferences and Regional Workshops in conjunction with domestic events with invited international experts have been reflective of the “think global” concept. In the meanwhile, learning from and engaging in capacity building activities initiated and supported by IPSI has allowed not only to achieve the two targets of TPSI Strategic Framework domestically but also share Taiwan’s experiences with other partners around the globe. Particularly, since when the first member joined IPSI in 2011 till mid-2019, Taiwan’s members contributed to IPSI’s efforts (Appendix A) by presenting 12 case study reports to IPSI website, participating in three Collaborative Activities, realizing four projects under the financial assistance of the SDM, and submitting five case study-based research and field experiences for publication in the annual SITR.

Lastly, as TPSI is a multi-level, multi-sectoral and multi-stakeholder national partnership network, its success relies on unceasing support from the Forestry Bureau of Taiwan Council of Agriculture, coordinating efforts of NDHU, and continuous participation from its diverse and numerous members.
CONCLUSION: FUTURE OUTLOOK FOR THE SATOYAMA INITIATIVE

As the global Satoyama Initiative is about to celebrate its decennial anniversary and with the Post-2020 Global Biodiversity Framework soon to be in place, it is essential to put its current activities and contributions in light of the future perspectives. Unprecedented and accelerating decline of plant and animal species with around 1 million of them threatened with extinction in the next few decades (IPBES, 2019) calls for a “transformative change” in human behavior. This kind of change, as remarked by IPBES chair Sir Robert Watson, means “a fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values” (IPBES Media Release, 2019). The question at hand is whether the Satoyama Initiative is capable of achieving this much needed transformative change? Given task applies to rebuilding coupled social-ecological systems in both global and national contexts, which means that the role of TPSI in this regard is hard to be overestimated.

Proposed outlooks for the future of the Satoyama Initiative suggest that the interplay and complementarity between the actions taken at the global, national and local levels as well as multiplicity and diversity of engaged stakeholders will continue to be at the core of prospective solutions. Presented below are some of such viewpoints worthy of future research and discussion:

- The Satoyama Initiative has proven to be an effective tool for biodiversity conservation and sustainable resource use, especially by “mainstreaming” biodiversity to a broader audience (Takeuchi, 2019), while modern-day media and technology can play a vital role in facilitating this action even further.

- In any given social-ecological system, a clear balance should be devised between conservation goals of the ecological system and economic aspirations of the social system (Takeuchi, 2019). In other words, policy-making processes at various levels need to be mindful of multiple values of nature such as nature in its intrinsic form (non-anthropocentric value), nature’s contributions to people (instrumental value) and good quality of life (relational value) so as to devise a fair judgement towards a sustainable resource use in SEPLS (Diaz et al., 2015).

- In seeking solutions for local challenges faced by SEPLS it is essential to be viewing them in a global context with consideration of modern-day socio-economic realities where interconnected, coupled and multilayered social-ecological systems are explored. At times where isolated local efforts might seem too difficult to achieve, regional and national cooperation pulling on strengths of each locality might provide a viable solution for SEPLS revitalization (Takeuchi et al., 2016).

- Bridging of different knowledge systems in SEPLS – indigenous and local knowledge systems with scientific knowledge systems – on evidence-based guidance for the natural resource management is crucial for the revitalization of SEPLS and moving towards sustainability (Gu and Subramanian, 2014; Tengö et al., 2017).

- Given the importance of biodiversity in natural and man-made systems, biodiversity-related international bodies, processes and targets (e.g. IPBES, CBD and ABTs) require their interconnection and cross-mainstreaming with other organizations, initiatives and goals that address the global change (e.g. IPCC, the Paris Agreement and SDGs) (Takeuchi, 2019). It is only a multi-level and multi-stakeholder governance that is capable of eliciting a “transformative change” of the scale sufficient enough to curtail the present-day biodiversity crisis (Takeuchi et al., 2016; IPBES, 2019).

ACKNOWLEDGEMENTS

We would like to show our gratitude to the Institute for Global Environmental Strategies (IGES) and the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) for their financial and administrative support of the SDM 2016 project on “Facilitating the Development of a Taiwan Partnership for the Satoyama Initiative (TPSI).”
REFERENCES


Date submitted: September 18, 2019
Reviewed, edited and uploaded: September 27, 2019
## APPENDIX A: PARTICIPATION AND CONTRIBUTIONS OF TAIWAN’S IPSI MEMBERS

<table>
<thead>
<tr>
<th>#</th>
<th>Taiwan’s IPSI members</th>
<th>Year of becoming an IPSI member</th>
<th>Case study reports (as IPSI website is currently under construction, the link is temporarily unavailable)</th>
<th>Collaborative activities (as IPSI website is currently under construction, the link is temporarily unavailable)</th>
<th>Awards from the Satoyama Development Mechanism, SDM</th>
<th>Papers published in annual Satoyama Initiative Thematic Review, SITR</th>
</tr>
</thead>
</table>
| 1  | National Dong-Hwa University (NDHU)                      | 2011                            | • 2014: “Society – Ecology – Production’ Landscape coordination, planning and management: Conservation of a rice paddy cultural landscape in an indigenous community, Taiwan”  
• 2016: co-submitted with the Forestry Bureau: “Facilitating the Development of a Taiwan Partnership for the Satoyama Initiative (TPSI)” | • 2014: granted: “Incorporating the Satoyama Initiative into national and local contexts – A case study of a collaborative planning process of a rice paddy cultural landscape in an indigenous community, Taiwan”  
• 2016: granted: “Towards an integrated multi-stakeholder landscape approach to reconciling values and enhancing synergies: a case study in Taiwan” | • 2018: selected for publication in SITR 2: “Tailoring the Satoyama Initiative concepts to the national and local context: a case study of the collaborative planning process of a rice paddy cultural landscape in an indigenous community, Taiwan”  
• 2019: selected for publication in SITR 5: “Converting pests into allies in tea farming: a SEPL case in Hualien, Taiwan”  
• 2018 selected for publication in SITR 4: “Transformations towards sustainability – A SEPLS restored by the Gongrong community” |
| 2  | Taiwan Society for Wildlife and Nature (SWAN)           | 2012                            | • 2018: co-submitted with TFRI and NTU: “Converting pests into allies in tea farming: a SEPL case in Hualien, Taiwan”               | • 2013: granted: “Converting pests to allies in tea farming – a potential case of Satoyama landscape in Hualien, Taiwan”                                                               | • 2015: selected for publication in SITR 1: “Converting pests into allies in tea farming: a SEPL case in Hualien, Taiwan”  
• 2018 selected for publication in SITR 4: “Transformations towards sustainability – A SEPLS restored by the Gongrong community” | • 2018: selected for publication in SITR 2: “Tailoring the Satoyama Initiative concepts to the national and local context: a case study of the collaborative planning process of a rice paddy cultural landscape in an indigenous community, Taiwan”  
• 2019: selected for publication in SITR 5: “Towards an integrated multi-stakeholder landscape approach to reconciling values and enhancing synergies: a case study in Taiwan”  
• 2018 selected for publication in SITR 4: “Transformations towards sustainability – A SEPLS restored by the Gongrong community” |
<p>| 3  | Taiwan Ecological Engineering Development Foundation (EEF) | 2013                            |                                                                                                                                  |                                                                                                                                  |                                                                                                                   |                                                                                                                   |</p>
<table>
<thead>
<tr>
<th></th>
<th>Institution</th>
<th>Year</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Environmental Ethics Foundation of Taiwan (EEFT)</td>
<td>2014</td>
<td>• 2015 submitted: “Promotion of conservation of rice paddy terraces and freshwater resources through agricultural activities in Gongliao, Taiwan”</td>
</tr>
<tr>
<td>5</td>
<td>Hualien District Research and Extension Station of Taiwan Council of Agriculture (HDARES)</td>
<td>2016</td>
<td>• 2016 submitted: “Research and promotion of agro-biodiversity indicators of rice paddy fields in Eastern rural Taiwan”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2016 co-submitted with NDHU: “Integrated project of enhancing eco-agriculture and sustainable development of rural Taiwan through international cooperation”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2017: granted: “Taiwan stingless bee field investigation and greenhouse pollination preliminary work”</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>• 2017: selected for publication in SITR-3: “Indicator species for agro-biodiversity in rice paddy fields: Research and its application to a new eco-labelling scheme in Eastern rural Taiwan”</td>
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<tr>
<td>6</td>
<td>Forestry Bureau, Taiwan Council of Agriculture</td>
<td>2016</td>
<td>• 2018: co-submitted with NDHU: “Promoting the establishment of Taiwan Partnership for the Satoyama Initiative (20147-2017)”</td>
</tr>
<tr>
<td>7</td>
<td>Tse-Xin Organic Agriculture Foundation</td>
<td>2016</td>
<td>• 2016: submitted: “Taiwan green conservation and labeling program: a system to promote biodiversity conservation and sustainable agriculture”</td>
</tr>
<tr>
<td>8</td>
<td>Soil and Water Conservation Bureau, Taiwan Council of Agriculture</td>
<td>2017</td>
<td>• 2018: co-submitted with SWAN and NTU: “Transformational sustainability: revitalization of Gongrong SEPL”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2019: co-submitted with SWAN and NTU: “A case study of Shangde community, Donghe Township, Taitung County, Taiwan”</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• 2017: co-submitted with SWAN: “2018 International Seminar on Resilience in SEPLS”</td>
</tr>
<tr>
<td>10</td>
<td>National Pingtung University of Science and Technology</td>
<td>2018</td>
<td>• 2018: submitted: “Forest economy to promote the Satoyama Initiative – A case”</td>
</tr>
<tr>
<td>Rank</td>
<td>Organization/Individual</td>
<td>Year</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Farmers' Association of Fuli Township, Hualien County, Taiwan</td>
<td>2018</td>
<td>Study of Wutai Township, Pingtung County.</td>
</tr>
<tr>
<td>12</td>
<td>Chinese Society for Environmental Education</td>
<td>2018</td>
<td>2019: Submitted: “Environmental education curriculum program to promote the practice of the Satoyama Initiative – A case study of the Forest Bureau’s Natural Education Center”</td>
</tr>
<tr>
<td>13</td>
<td>International Cooperation and Development Fund (ICDF)</td>
<td>2019</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>National Yunlin University of Science and Technology</td>
<td>2019</td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX B: TPSI REGIONAL WORKSHOPS FROM 2016 TO 2018

<table>
<thead>
<tr>
<th>Regional network of TPSI</th>
<th>Year</th>
<th>Number of institutional units</th>
<th>Number of participants</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPSI-N</td>
<td>2016</td>
<td>9</td>
<td>15</td>
<td>October 15th, 2016</td>
<td>New Taipei City</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>21</td>
<td>35</td>
<td>August 29-30th, 2017</td>
<td>Yilan County</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>24</td>
<td>40</td>
<td>June 7-8th, 2018</td>
<td>New Taipei City</td>
</tr>
<tr>
<td>TPSI-W</td>
<td>2016</td>
<td>11</td>
<td>11</td>
<td>November 27th, 2016</td>
<td>Miaoli County</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>19</td>
<td>31</td>
<td>June 29-30th, 2017</td>
<td>Nantou County</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>28</td>
<td>55</td>
<td>June 14-15th, 2018</td>
<td>Nantou County</td>
</tr>
<tr>
<td>TPSI-S</td>
<td>2016</td>
<td>9</td>
<td>14</td>
<td>July 13-13th, 2016</td>
<td>Kaohsiung County</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>26</td>
<td>47</td>
<td>May 26-27th, 2017</td>
<td>Pingtung County</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>27</td>
<td>36</td>
<td>November 28-29th, 2018</td>
<td>Pingtung County</td>
</tr>
<tr>
<td>TPSI-E</td>
<td>2016</td>
<td>13</td>
<td>23</td>
<td>December 7-8th, 2016</td>
<td>Hualien County</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>23</td>
<td>35</td>
<td>July 25-26th, 2017</td>
<td>Hualien and Taitung Counties</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>23</td>
<td>42</td>
<td>September 20th-21st, 2018</td>
<td>Taitung County</td>
</tr>
</tbody>
</table>

Total 2016: 42 participants, 63 participants
Total 2017: 89 participants, 148 participants
Total 2018: 102 participants, 173 participants
APPENDIX C: LIST OF ABBREVIATIONS

ABTs: Aichi Biodiversity Targets
CBD: The Convention on Biological Diversity
CSEE: Chinese Society for Environmental Education
EEF: Taiwan Ecological Engineering Development Foundation
EEFT: Environmental Ethics Foundation of Taiwan
HBSWC: Hualien Branch, Soil and Water Conservation Bureau, Council of Agriculture
HDARES: Hualien District Agricultural Research and Extension Station, Council of Agriculture
HFDOFB: Hualien Forest District Office, Forestry Bureau, Council of Agriculture
IGES: The Institute for Global Environmental Strategies
IPBES: The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPSI: The International Partnership for the Satoyama Initiative
MOEJ: The Ministry of the Environment of Japan
NDHU: National Dong-Hwa University
NGOs/ NPOs: non-governmental organizations/ non-profit organizations
NPUST: National Pingtung University of Science and Technology
NTU: National Taiwan University
OECMs: other effective area-based conservation measures
SDGs: Sustainable Development Goals
SDM: The Satoyama Development Mechanism
SEPLS: socio-ecological production landscapes and seascapes
SWAN: Taiwan Society for Wildlife and Nature
TPSI: Taiwan Partnership for the Satoyama Initiative
UNU-IAS: United Nations University Institute for the Advanced Study of Sustainability