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The concept of vulnerability and creation of sustainable well-being based on sago forest resources in Nakhon Si Thammarat, Thailand

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ABSTRACT

This article is included in the research study on Sago Tree Plantation, its dynamics and utilization, in the Nakhon Si Thammarat province. It studies the vulnerability and modification of the sago forest resources in the Nakhon Si Thammarat province. It uses observation from cooperative inquiries and group discussions among 16 key informants knowledgeable of the sago forest resource's management and production. It interprets the issues and presents findings through descriptive analysis to find ways to reduce the limitations. There are structural vulnerabilities of the development policy and modern water management systems, Land tenure vulnerabilities and conflicts. The study also suggests modifications to generate more income, improve food security and the sustainable use of national resources.

Keywords
Context of vulnerability, well-being, sustainable.

Introduction

Sago, or sago forest, as the villagers call it, is an important plant in the wetlands. It is distributed along the banks of the Nong Pru canal and naturally found around the surrounding area. This is the sago planted by the villagers for their use [1], under the sago forest ecosystem. Its ecologically and biologically diverse environment [2], serves as a habitat for plants, animals and insects, and a breeding ground for aquatic animals. Villagers can conserve and consume both of these resources. It produces food, medicine and is also a substantial source of income. Thus, it becomes a part of the culture and livelihood. In ecology, sago is important for the maintenance of wetlands because they are water-retention plants. It helps by providing water sources for agriculture, conserving soil, and is the main plant of this ecosystem. The biodiversity of the sago forest ecosystem helps the nearby communities. Direct and indirect methods of extracting Sago starch are the way of life in the ecological community [3]. They enhance the local wisdom culture and living capital [4].

The sago forests in the area also come with a vulnerability context [5], because of its continued decline in the Nakhon Si Thammarat province. The increasing observations show the occurrence of natural threats to the vulnerability context. The concept of structural vulnerability is mainly in the form of the policy of development, modern water management systems, land tenure and conflicts. The concepts of structural change in population also affect the relationship between an ecosystem's social ecology and the biodiversity of its habitat. Additionally, the lack of accurate knowledge about sago and the community's economy also causes the loss of sago forests. Most people do not appreciate the substantial resource value of the sago forests in the local community due to the lack of inherited knowledge from the older generation.

Therefore, the efforts of reducing the Sakhu area's vulnerability in Nakhon Si Thammarat province is necessary to determine the spatial well-being of the study [6]. It includes generating an increased income from the sago forests' products, improving food security and sustainable use of national resources. It also includes the adaptation of the well-being concept by the villagers [7], of contemporary Thai society. Since land resources are crucial in rural and suburban communities, the resource changes occurring to sustain adaptation is complex and important. The rapid change also inspires the creation of well-being under this structure type. Thus, the researcher's interest in studying the context, vulnerability and, building of well-being of the province's sago forest resource lead to adaptation, cognitive enhancement and awareness of the sago forest resource value in Nakhon Si Thammarat province. It builds a resource base for sustainable living and overall well-being.

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Objective

To study the concept of vulnerability and the modification of sago forest resources in the Nakhon Si Thammarat province.

Methodology

Research using qualitative methods of study

This is field research that employs qualitative methods by providing opportunities to varied people and multiple sectors to participate in the systematic operations in a specific (Purposive Sampling) urban area. Pattani Province, in particular, has shown encouragement in the participation of all sectors to maintain cultural harmony. There is active participation from this area's members of the public and the private sector reducing constraints like the vulnerability of well-being.

population in the study

In this research study, the researcher has set the target sample of the population as follows:

1. The main contributors, which consist of the following groups: 10 groups of people in the area are selected as the samples for determining the results of a specific purpose (Purposive Sampling). In this context, the aim is to study the information related to the development of the Sago Forest, with emphasis on the utilization of resources and the well-being of the ecosystem thereof.
2. A sample of a group of 2 people who hold the right to eat, but not in the area of study. The purpose is to collect information relating to the management of the specific area.
3. Samples of groups of 2 people each from the government sector to study the policies that relate to the Sago forests, their management and support system, and the entitlements of the Sago Forest, including its rights in public areas.
4. A sample of 2 people in a group created out of individuals from the private sector by using the snowball sampling method. The snowball selection of the private sector is to build a way for them to participate in the management and privatization of production to generate greater income for the people in the community.

Data collection

This study is focused on reducing the vulnerability concept of people in the areas surrounding the Sago forests. By using techniques like in-depth interviews and cooperative action research, data collection proves effective in finding the prevailing development issues and aids in the mitigation of local vulnerability. Field trips are organized for conducting in-depth interviews to collect information relating to the groups of public and private citizens and analyze the development stage and needs of the Sago Forest and the vulnerability of the ditch forest.

The methodology includes conducting group discussions to gain insights on the study and the systematic use of public, government and private sector's ideas on the opinions and issue of the right to agriculture, apart from the area in the discussion. This aims to collect information on the management of the specific area, the policies related to Sago forests, its management, and the entitlements of the Sago Forest. These include their rights on the public space, participation in the matters of its management and privatization of the production undertaking to generate substantial income for the people in the community. This led to a meeting to draw the necessary conclusions on the study.

A final group seminar was conducted to present information on each group. The groups of people in the concerned area, including the public as well as the private sector took participation for us to obtain relevant information from each group, and to link the information obtained thereof from the participating area. All the information was then arranged into categories for data analysis. It was followed by documenting a complete research report, disseminating it to the public and presenting its findings after the analysis of descriptive data.

Results

The concept of vulnerability to natural threats:

The benefits of Sago, a native plant of wetlands in southern Thailand, diminish the vulnerability context of natural threats. It also plays a role in the cultural prominence and neighbourhood people's livelihood related to educating people about the sago benefits in absorbing water. The roots of the sago, bending over the earth, form small streams of water. This basin acts as a shelter for smaller aquatic creatures and helps to reduce the force of the water, not letting it flow faster into the sea. The global average temperature increases due to Global Warming and Climate Change. As a result, the Greenhouse Effect is a threat to Nature. There will be a global effect of this phenomenon,

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one way or another. The sago forest in this study, for example, will not be an exclusion to the Greenhouse Effect. According to the spatial analysis, the hot weather affects the growth of the sago forest. The heat does not allow the sago forest to perfectly absorb water. Therefore, the climate affects the natural ecosystem. Since the villagers thought its water-retention qualities are useless, the forests' utility decreased and the sago forest began to decline due to lack of value. The government development policies have transformed most of the area into a monoculture area.

The structural vulnerabilities due to development policy:

These structural vulnerabilities are due to a policy-based development approach of the forest restoration community for fertility and sustainability. It includes intensive pipeline area development or any new defined development. This involves the new farming or monoculture community which the government supports to grow economic crops such as rubber and oil palm. This destroys the sago forests by expanding the area of economic crops and affects the transformation of the area. The farming land, encroaching on the sago forests, decreases their area which creates problems down the ecosystem. The state, villagers, private institutions started a policy for the management of the supplementary planting area. The planning started with the concept of community forests by involving people to manage quarantine areas, reduce the use of natural resources and replace them with a fertile source. This includes using that place for storage of forest products like herbs or utilizes fuelwood, raising animals etc. Rubber plantation is the main occupation. The community has an additional career by taking advantage of local resources. The community can generate income by sewing or beetle-raising. While there is a lack of government support in providing accurate knowledge about tapioca and the community's economy, there is also no instruction on sago's importance. The new generation also did not understand and utilize sago because of the lack of learning and inherited knowledge from older generations. Therefore, the development of the Sakhu forest became more intense and conflicted in the area.

Land tenure vulnerabilities and conflicts:

The vulnerability of land tenure and the conflict in the results show the past and present changes in landholdings. It is clearer when the former land ownership rights are owned by the government. It shifts with public ownership and allows people to use the sago forest resource for food-related purposes. In 1961, the state allocated arable land and designated public areas to individuals by allowing land ownership rights. After the release of this policy, people in the area transformed sago forests for agricultural uses and sustenance. This meant assigning more land for market-oriented farming. Meanwhile, land ownership means a change in ownership, invading the sago forest more. Some private individuals also buy land for profit and housing. Presently, the sago forest area of Nakhon Si Thammarat has a majority of younger people. Therefore, conflicts arise between them and traditional people using that area for subsistence. The conflict is with the new immigrant's capitalist ideas. It worsens with the destruction of natural sago forests and severe flooding in the urban area. The land reclamations and water-absorbing sago forest resources are destroyed by mainstream development.

The vulnerability of modern water management systems:

The above developments also affect the vulnerability to modern water management systems. It is due to the above development currents and the emphasis on using technology to increase productivity. These systems have a new type of water management that flows through government agencies especially the Royal Irrigation Department. The traditional water management that farmers previously used is obsolete and technically incorrect. These methods greatly reduced the community's valuable water supply from the sago forest. Some cases see the Sakhu forest negatively as their root system slows down the water flow and cause flooding. Some even consider sago forest a breeding ground for rice pests like the rat. The sago forest is dredged and shredded in large numbers for these two reasons. The destruction of the sago forest near the city or with convenient transportation is due to the city and community expansion. These changes affect the community regarding its water system and its relationship with the sago forest. It affects the community ties to the sago forest and its utilisation and the sago forest ecosystem. Thus, a group of villagers from the public and private areas joined together for a group meeting. Its objective was to propose an idea for sustainable sago forest management. They wanted to reduce vulnerability, increase stability and well-being of the sago forest in the Nakhon Si Thammarat province.

Create well-being with increased income:

The sago forests' leaves are a great source to create well-being and generate income. This consists of making mats and shelter roofs from them. The study on generating income from making mats shows that an average household monthly earns approximately 1,000–1,200 baht which makes its total annual income approximately 14,400 baht. Roofing activities from the sago forest leaves have an average income of approximately 3,000–3,500 baht which is approximately 42,000 baht per household annually. The trunk of sago forests can also generate income by acting as animal feed, beetle farming and Tapioca flour processing. Tapioca can be processed into various types of food. It can

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be processed into animal feed. According to the study, the income generated from animal feed for an average household is approximately 2,000 monthly and 24,000 per household annually. Beetle farming can also generate income. The monthly income from beetle farming is 10,000 baht; the average annual income is approximately 100,000 per household. The processing of tapioca flour costs 200 baht per kilogram. The average monthly household income from it is about 2,000 per household and the average annual income is about 20,000 per household. The last component is processed into different types of food earning a monthly household income of 2,000 baht and the total annual average is approximately 20,000 per household.

Create well-being to increase food security:

The creation of well-being based on food security of Sakhu Forest in Nakhon Si Thammarat Province can be a successful endeavour by making the best of the stems and leaves. In addition to generating more income, it also maintains that the wisdom of food translation, such as increasing food security in challenging situations by taking advantage of the leaves and other offerings of the flora for elevating the dwelling space or life. As for the trunk of the trees as a whole, it can be put to good use transforming it into Sago mats. At the same time, some villagers also brought trunks for grinding and raising animals. The trunks are also good for raising sago beetles and processing of food. There are several words of wisdom passed down from our ancestors to the present generation, like grinding the stems to the ground to transform them into Sago seeds, processing them into candle candies and bird glue snacks etc. Some households generate income from such activities easily, as compared to their current economic situation.

Sustainable utilization of national resources:

As we can gather from the policy of Nakhon Si Thammarat Province, there are efforts to promote and create guidelines for Sago conservation to be able to use the resources efficiently. The full utilization of the Sago tree and the consequences of local transformation it causes a large scale invasion of the Sago trees. As a consequence, it was initiated to use the entirety of the trunk for utilization in the processes. This is linked to food security, economic development and generation of income for the people in the community. It is also aimed at improving the quality of life of the elderly who provide the traditional wisdom of Sago seeds with social activities such as telling each other about making traditional sago seeds among the community members. The development and change of the Sakhu forest show the relationship of the people in the society and their generosity towards each other, unity, and grouping for community activities to create a strong community unit. These positive steps and virtues can lead to the process of sustainable development of the community and society.

Discussions

A Study of Concept, Vulnerability and Sustainable Well-Being Based on Sago Forest Resources in the Nakhon Si Thammarat province [8].

This study of the natural resource management dynamics of communities in Nan province is a genuine effort to learn and holistically manage resources between human and physical ecosystems. The research results show the adjustment of the community and related agencies in the study of economic, social, and cultural value which did not have much previous education. This work is also linked to the studies of Chum-in & Prapruit [9], as for the vulnerability to farming, households in a watershed area of Ban Lo Han in the Pa Bon District of the Phatthalung province have tried to reduce the vulnerability of the community. It uses are two approaches:

1) Reducing the risk of using farmland with farming and integrated agriculture.

2) Increasing the potential to tackle or adapt the current problems with water resource integration and management.

We find that there are important reasons, based on the study results, besides the reduction of the vulnerability of sago forest resources. It includes forecasting future climate trends [10], like warm weather, increasing or decreasing rainfall, and exposure to climate change or Climate Exposure, and sensitivity and adaptive capacity of sago forest communities. Therefore, the Department of Disaster Prevention and Mitigation Ministry of Interior puts forth a proposal [5], on the issue of integrating disaster risk reduction in development. This mainstream disaster risk reduction program development is an issue that all parties, organizations, and sectors at every level must consider. The Department of Disaster Prevention and Mitigation with the United Nations Development Program's support (UNDP) builds the capacity for Thailand's disaster management. The Asian Disaster Preparedness Center (ADPC) readily cooperates to reduce disaster risk to sustainable development. The objectives are to strive for well-being and improve the quality of life for the people in that area. This is consistent with the study of Phromphuang [6], to

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balance materialism and spirituality. It means living with constraints, diseases and disabilities where imperfections are powerful but one must be determined to reach the destination. There are various elements of well-being that include living by perceptions, meditation, wisdom, and compassion. It can be divided into 7 areas [11]. These elements focus on family life issues and living sustainably according to State governance. This is consistent with the Office of the National Economic and Social Development Board's policy [12]. It creates well-being based on good physical and mental health, knowledge, and employment. It also says to have sufficient income for living, and a warm and stable family in a good environment. To conclude well-being is a person's perception of a positive object, their environment and well-being. According to the well-being study results, one [7], must establish a social strategy to adapt and reduce vulnerability contexts. This includes trying to create a living diversity while participating. It focuses on community participation in Nakpibal & Chantanee [13], Goswami & Gehlot [14], and also the interaction between common resources [4].

Conclusion

The context, vulnerability, and the building of well-being of sago forest resources in the Nakhon Si Thammarat province: The summary of the study results shows the vulnerabilities due to natural threats and policy development approaches, Land tenure vulnerability and conflicts. It also indicates the vulnerability to modern water management systems. Therefore, an established sustainable approach to sustainable sago forest management reduces its vulnerability and increases its stability and well-being. Its objectives are to create well-being, increase income, build well-being based on the food security of the Sago Forest. This creates the sustainability of sago forest in the Nakhon Si Thammarat province. (Fig. 1):

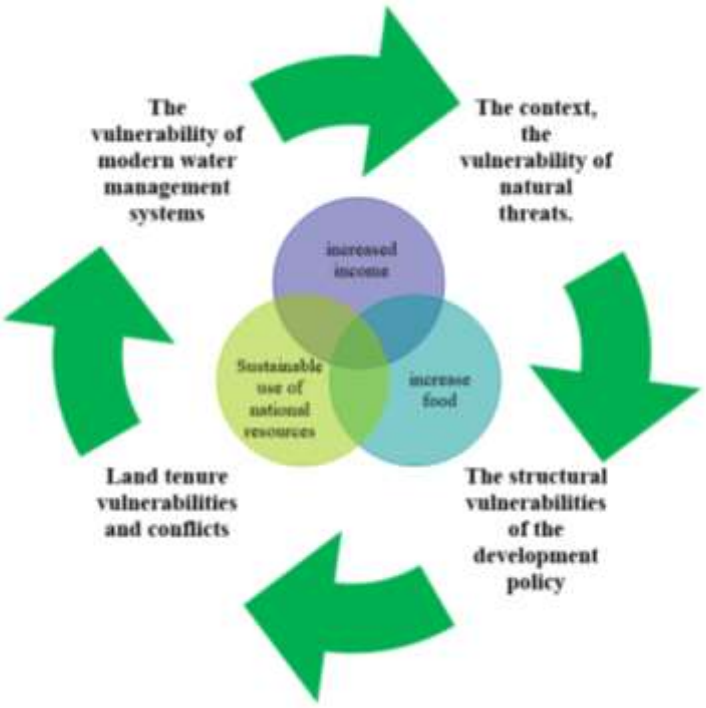

Fig. 1. Model Context, vulnerability and creating sustainable well-being based on sago forest resources in Nakhon Si Thammarat Province.

Limitations and Future Studies

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This research guides development for resource vulnerability contexts so that communities can live well on a sustainable resource base.

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