UNIVERSITY MANAGEMENT STRATEGIES ACCORDING TO THE CONCEPT OF CAPACITY BUILDING IN BIODIVERSITY OF THAILAND

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Abstract: This research was aimed to 1)examine the concept of university management following the concept of capacity building in biodiversity of Thailand 2) explore the current and desirable situations of university management based on the concept of capacity building in biodiversity of Thailand. 3) to analyze strengths, weaknesses, opportunities and treats of university management following the concept of capacity building in biodiversity of Thailand; and 4) to develop management strategies of university management following the concept of capacity building in biodiversity of Thailand. The study applied a mixed method approach. The samples were 94 higher education institutors. The instruments used in this study were a questionnaires on the conceptual framework, a questionnaire on the current and desirable situations, and the strategic evaluation form to testify feasibility and appropriateness. The data were analyzed by frequency, percentage, standard deviation, $PNI_{Modified}$ and content analysis. The research results show the following findings. (1) the conceptual framework of the university management of; (1) To providing graduates (2) To research and (3) To providing academic services for based on the concept of capacity building in biodiversity of Thailand as follows: Access and benefit sharing included embedded learning and concept. Conservation and rehabilitation; and Development of biodiversity values. (2) For the current situation, the 3 missions, i.e. graduates production, research, and academic services are at moderate level, while they are at high level for the desirable situation. (3) Their strengths are academic services and research; weakness is graduates production; opportunities are academic services and research were the government policy economy society and technology and threat is graduates production were the government policy economy society and technology (4) The university management

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according to the concept of capacity building in biodiversity of Thailand comprises 3 main strategies: 1) reforming management and development of graduates based on the concept of capacity building in biodiversity of Thailand; 2) enhancing research management based on the concept of capacity building in biodiversity of Thailand; and 3) upgrading academic services based on the concept of capacity building in biodiversity of Thailand. These strategies are intended to strengthen the protection of species of the living organisms and the ecosystems for sustaining natural and environmental balances.

Keywords: University Management, Biodiversity, Access and Benefit Sharing, Conservation and Rehabilitation, Development of Biodiversity Values.

Introduction

Biological diversity or biodiversity refers to the diverse properties of living organisms from the levels of genes, species, to the diversity of ecological community. Based on the Convention on Biological Diversity, the definition encompassed the larger ecosystems (Gosselin et al., 2004), the differences of living organisms including genes, species, and changes as a result of evolutionary changes over time and the natural balance within a range of habitats (NSTDA, 2554) Biodiversity indicates the variation in ecosystems and living organisms in each area, which tends to be greater around tropical areas and is likely to increase. Biodiversity does not evenly distribute on earth but in different proportions. It is richer In tropical areas than others, while at the same time tends to slow or decline or may even extinct as a result of natural changes, consumption by human for their living, and increased treats from community expansion by such as deforestation, agricultural use, or being used as food. (*Sasin Chalermlarp* and Wannobon Kuan-Arch, 2011)

Maintaining biodiversity is thus important as it offers both direct and indirect benefits to human. Biodiversity links with life and environment in various aspects such as health, agriculture, industry, as well as business. It can be observed that human relies on biodiversity from clear water, fresh air, to better environment. For example, soil nutrients effect agricultural sector and in turn enables food quality development and well-being of local people. People living in the areas of variation and biodiversity can make use of such different biodiversity that supports their living in different areas. (COHAB, 2010 : online). The conservation of biodiversity has become the objective defined by the government agencies to encourage communities and scientific organizations to function in biodiversity conservation and rehabilitation. Despite with the obligation to reserve major biodiversity, these focuses were often less effective to conserve biodiversity and to identify the values and understanding on biodiversity (TEEB, 2008: online). Therefore, it requires rules and regulations for the conservation and rehabilitation, and accessibility and utilization of biodiversity resources. For the use of other types of ecosystems and biodiversity other than by the government sector or scientists, it is necessary to provide them with knowledge and understanding about the consequences of such use. (Rebecca M. & et.al. 2014) Biodiversity is the source of food and medicines, advantages we should value and encourage for further study and research (Somsak Punha, 2015) Ecosystems with biodiversity not only be utilized as the 4 necessities by human, but

also significant in promoting the quality of life and society as it provides tourism sites, CO_2 absorber, food source, and shelter for living organisms, and food for community as well (NSTDA, 2011). It is clear that biodiversity is vital to human livelihood, food security, improving poverty, and development. However, development without reflecting on the sustainment of biodiversity resources, excessive use of resources without considering their limits and recovery, degradation of ecosystems and natural habitats (Charoenwit Harnkaew, 2010) , economic expansion, and careless use of resources can cause their deterioration or damages, that give rise to serious problems in every country such as global warming, greenhouse effect, climate variability, loss of balance in ecosystem and biodiversity, natural catastrophe in every continent all over the world. Among major causes are excessive consumption of human and discharges of garbage and waste that harm the environment (*Pruet* Siribanpitak, 2010).

At present, some of the universities adopt a strategic shift such as those in Africa which allowed for changes and increased competitive capacity from the use of biodiversity and the opportunity for Africa to develop products harmless to environment but offering economic benefit while sustaining local biodiversity (Okoche J.& Michael M., 2013: online). The Lougborough University incorporated biodiversity strategy as part of its biodiversity action plan to link with the locality in order to promote the UK's biodiversity following the Convention on Biological Diversity, with 3 main objectives, 1) conservation of biodiversity; 2) sustainable use of biodiversity resources; 3) fair sharing of benefits and covering biodiversity at all levels (UNCED: online). This will lead to increased knowledge, understanding, and awareness of biodiversity, and effective strategy or approach or guideline can be developed for university administration in order to promote appropriate and worthy use, conservation and rehabilitation of biodiversity of the country. As a consequence, it will foster economic, social, and environmental development, and serve as a source of income generation for local community, as part of sustainable development of biodiversity of Thailand and the world.

Research Objectives

There are four objectives:

1. To examine the conceptual framework of university management following the concept of capacity building for biodiversity in Thailand;
2. To explore the current and desirable situations of university management based on the concept of capacity building for biodiversity in Thailand.
3. To investigate the strengths, weaknesses, opportunities, and threats of university administration according to the concept of capacity enhancement for biodiversity of Thailand;
4. To develop university administration strategies according to the concept of capacity enhancement for biodiversity of Thailand.

Conceptual Framework

Figure 1 below shows the conceptual framework of this study.

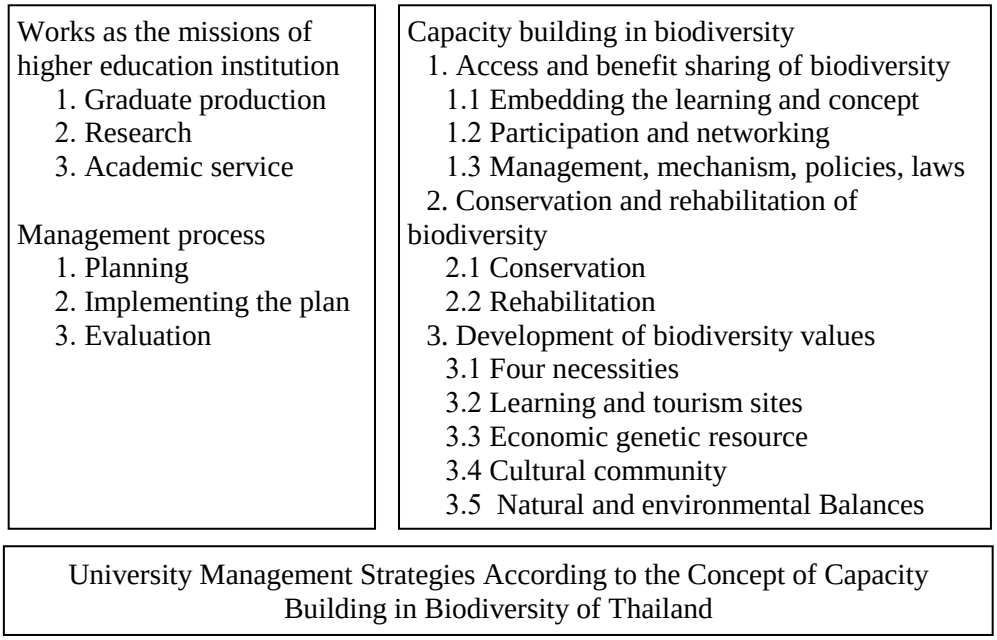

Figure 1: Conceptual Framework of This Study

Operational Definition

Biodiversity of Thailand refers to biodiversity of genes, biodiversity of species, and biodiversity of ecosystems existed in Thailand which required conservation, rehabilitation, development, and utilization on the basis of worthiness and equality.

University management strategies refer to an outreach approach to management of graduate production, research, academic service to society by means of planning, implementation of the plan, and evaluation in order to enhance biodiversity of Thailand.

Graduate production refers to a mission involving planning, implementing the plan, evaluating the management of curriculum, faculty, instruction, library and learning resources, and learning environment for capacity building in biodiversity of Thailand.

Research refers to a mission involving planning, implementing the plan, and evaluating research, networking research collaboration, and involving faculty in research for capacity building in biodiversity of Thailand.

Academic service to society refers to a mission involving planning, implementing the plan, and evaluation, offering the utilization of the institution's resources, providing counseling and training, management of knowledge in learning exchange to provide answers or guidance to the society, and provision of continuing education for people, for capacity building in biodiversity of Thailand.

Capacity building on biodiversity refers to management, accessibility, and utilization with value awareness; conservation and rehabilitation; and value development suitable for sustained biodiversity.

Access and benefit sharing of biodiversity refers to fair sharing of benefits and accessibility that cover all of the 3 types of biodiversity, i.e. biodiversity of genes; biodiversity of species; and biodiversity of ecosystems, with their value awareness.

Conservation and rehabilitation of biodiversity refers to the use of biodiversity resources for the benefit of human without causing depletion and extinction of genes or species of living organisms in the ecosystems; management to restore the reduced or degraded biodiversity and enable its reuse for sustainability.

Development of values of biodiversity refers to the management that allows for utilizing biodiversity resources as 4 necessities, i.e. learning and tourism sources, economic genetic resource, cultural community, and natural and environmental balances, in a worthy and sustainable way.

Scope

Population included 124 universities under the Office of Higher Education Commission. The samples were 94 universities, with a total of 754 informants of university presidents, vice presidents, deans, deputy deans, and instructors.

Method

Procedure

The researcher identified the following research procedures.

1. Exploring the conceptual framework of university management following the capacity building for biodiversity in Thailand.
   - 1.1 Obtaining information from documentary study and relevant research as baseline data for developing the conceptual framework.
   - 1.2 Evaluating the conceptual framework by 5 specialists using constructed interviews to specify the conceptual framework of university management according to the concept on capacity building for biodiversity in Thailand.
2. Exploring the current and desirable situations of university management according to the concept on capacity enhancement for biodiversity in Thailand.
   - 2.1 Using a questionnaire on the current and desirable situations of university management according to the concept on capacity building for biodiversity in Thailand.
   - 2.2 Examining IOC of the questionnaire by 5 specialists and making a revision.
   - 2.3 Identifying the reliability of 30 questionnaires through online and making a revision.
   - 2.4 Collecting the data by sending 754 questionnaires via mailing.
   - 2.5 Analyzing the data and concluding of results.
3. Analyzing the strengths, weaknesses, opportunities and treats of university management according to the concept of capacity building in biodiversity of Thailand.
4. Making drafted strategies of university management according to the concept of capacity building in biodiversity of Thailand.
5. Testifying the appropriateness and feasibility the strategies of university management according to the concept of capacity building in biodiversity of Thailand.

6. Developing the university management strategies according to the concept of capacity building in biodiversity of Thailand.

Research Instruments and Statistics

1. A questionnaire to interview specialists for the conceptual framework.
2. A questionnaire on the current and desirable situations of university administration according to the concept on capacity building for biodiversity in Thailand, which included a 5-point rating scale and additional suggestions.

Data Collection and Analysis

A total 255 returned questionnaires were received out of those sent via mailing. Statistical analyses included frequency, percentage, mean and standard deviation.

Findings

1. Conceptual Framework of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

The specialists agreed at high level to the conceptual framework of university administration based on the concept of capacity building in biodiversity of Thailand. The conceptual framework covers the management of graduate production, research, and academic service that promote the capacity building in biodiversity of Thailand, access and benefit sharing of biodiversity, biodiversity capacity, conservation and rehabilitation of biodiversity, and development of biodiversity values.

2. Current and Desirable Situations of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

2.1 The current situation of university management according to the concept of capacity building in biodiversity of Thailand, based on the analysis of internal environment, was at moderate level in overall. With respect to individual aspect, the highest mean was for research, followed by academic service, and the lowest mean for graduate production. The analysis of external environment suggested moderate level of the current situation of university management in overall, with highest mean for technologies, followed by social situation, and lowest mean for government policy and economic situation.

2.2 The desirable situation of university management according to the concept of capacity building in biodiversity of Thailand as shown by the analysis of internal environment was at high level in overall. Considering by individual aspect, the highest mean of desirable situation was found for research, followed by academic service, and the lowest mean for graduate production. The analysis of internal environment suggested high level in overall for the desirable situation of university management. For each aspect, the analysis showed highest mean for technology situation, followed by social situation and economic situation, and lowest mean for government policy.

3. Strengths, Weaknesses, Opportunities and Treats of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

3.1 The strengths of university management according to the concept of capacity building in biodiversity of Thailand were academic service and research.

3.2 The weakness of university management according to the concept of capacity building in biodiversity of Thailand was graduate production.

3.3 The opportunities of university management according to the concept of capacity building in biodiversity of Thailand were academic service respectively including economic situation, government policy, social situation, and technologies; and research respectively including economic situation, government policy, social situation, and technologies.

3.4 The threats of university management according to the concept of capacity building in biodiversity of Thailand were technologies, economic situation, government policy, and social situation, respectively.

4. University Management Strategies According to the Concept of Capacity Building in Biodiversity of Thailand

The University management strategies being developed comprised 3 main strategies and 9 sub-strategies as follows.

Main strategy 1 Reform of university management of graduate production and development according to the concept of capacity building in biodiversity of Thailand

Sub-strategy 1.1: Development of learning management process in access and benefit sharing of biodiversity.

Sub-strategy 1.2: Management of learning to establish involvement in the conservation and rehabilitation of biodiversity

Sub-strategy 1.3: Management of learning to develop the values of biodiversity

Main strategy 2 Strengthening university management of research according to the concept of capacity building in biodiversity of Thailand

Sub-strategy 2.1: Promotion of research process in the access and benefit sharing of biodiversity

Sub-strategy 2.2: Development of the management of research in conservation and rehabilitation of biodiversity

Sub-strategy 2.3: Integration of research on the development of biodiversity values

Main strategy 3 Upgrading university management of academic service according to the concept of capacity building in biodiversity of Thailand

Sub-strategy 3.1: Establishment of the management process for academic service in the access and benefit sharing of biodiversity

Sub-strategy 3.2: Strengthening the management of academic service in conservation and rehabilitation of biodiversity

Sub-strategy 3.3: Expansion of opportunities and establishment of involvement in academic service in the development of biodiversity values

Discussion

1. Conceptual Framework of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

Based on the investigation of the conceptual framework of university management according to the concept of capacity building in biodiversity of Thailand, the managements of graduate production, research, and academic service were intended to build the capacity in biodiversity following the tasks on manpower development, personnel development and establishment of required body of knowledge in response to biodiversity development of Thailand. In this respect, universities should identify the goal for manpower development and the establishment of body of knowledge and innovation so that they are transferred and extended for utilization in various ways that are conducive to biodiversity. It is to respond the need and to solve the problem of societies, enhance the knowledge and strengthen the societies in several aspects for their sustainable use of biodiversity. This agreed to the research by Kampechara Puripanya (2007) proposing strategies to promote Thai higher education institutions toward world class universities. The research aimed to study the success factor of world class universities and the current situation of universities, and to propose strategies to develop Thai higher education institutions toward world class universities. The findings revealed that the success factors of higher education institutions involved the management quality of universal mission including curriculum and instruction, research, academic service and cultural dimensions. With respect to capacity building in biodiversity of Thailand, it involved the access and benefit sharing of biodiversity that promote embedding the learning and concept, participation and networking, and management mechanism, policies, laws; conservation and rehabilitation of biodiversity; and development of biodiversity values including four necessities, learning and tourism sites, economic genetic resource, cultural community, and natural and environmental balances. It is in line with the Convention on Biological Diversity (UNCED: online) regarding environment and development, signed in 1992, and entered into force in 1993. The convention has 3 main objectives, i.e. conservation of biological diversity, sustainable use of its components, and fair and equitable access and sharing of benefits.

2. Current and Desirable Situations of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

The result showed that the current situation of university management according to the concept of capacity building in biodiversity of Thailand was at moderate level on the management of graduate production, research, and academic service. So far, the instruction on biodiversity is available however to less extent to correspond with the current changes, and the same is true for research and academic service. The university management provided a policy intended for specific groups with their instruction on science in a few institutions, while it has not been introduced in social science. With respect to capacity building in biodiversity in terms of access and benefit sharing, their current situation was found at moderate level. In overall, graduate production in this aspect of education has not been introduced and research and academic service were rare since they concern with laws and regulations in which there is no linkage between individual organizations with education, research and

academic service. As in the study by Jirapon Luengpailin and Viman Kritpolviman (2014) on legal problems related to the access and benefit sharing of biological resources, it was found that biological resources management in Thailand was ineffective. The problem with legal limitation and impediment is an important factor. Many laws did not focus on direct regulation of resource utilization such as the law to protect the areas of reserved forest, conserved forest, water source forest or the law to protect and promote Thai traditional medicine intelligence. The regulations of the National Committee for the Conservation and Utilization of Biological Diversity, despite applicable to all types of biological resources, limits to those resources under the possession and supervision of government sector but does not apply generally to the non-government sector. The laws related to the management of biological diversity resources in Thailand remain in limited areas. There are very few reports of study results on the situation and impact of those laws and regulations, access and sharing of benefits, and the benefits from utilization of biological resources in Thailand, and hence information on these aspects are vague.

The desirable situation of university management according to the concept of capacity building in biodiversity of Thailand was at high level with respect to access and sharing of benefits of biodiversity, conservation and rehabilitation of biodiversity, management of biodiversity values. Thailand is rich of biodiversity and it is biodiversity that has supported and sustained the life of Thai people from the past to present and also provides the bedrock for the national socio-economic development. Thailand is the site of cultural and traditional diversities in which biodiversity has long been utilized in the community way of life in each area which may be varied or similar across localities depending on their climatic and geographical features, attitude, belief, and livelihood. The cultural and traditional values and knowledge have been applied to produce a range of benefits including food, cosmetics, health care, community products, living stuffs. Thailand provides the diversity in herbal resources and the climatic and geographical features are suitable for herbal growth. Herbs have been extensively developed using modern technologies and they tend to grow constantly in the forms of medicine, supplementary food, cosmetics, and spa. Their marketing values have been no less than 30,000 – 40,000 baht per year, with the growth rate of 10 – 20 % annually. In view of this, the desirable situation in the management of graduate production, research, and academic service are increasingly required to respond to the development of biodiversity. According to Sirikul Bunpapong (2014), biodiversity is a primary foundation to human living and improved well-being, and also provides key mechanism to education, research, development, innovation, and production of goods to the markets, resulting in economic security.

3. Strengths, Weaknesses, Opportunities and Treats of University Management According to the Concept of Capacity Building in Biodiversity of Thailand

3.1 The research result pointed out that the strengths of university management according to the concept of capacity building in biodiversity of Thailand were the management of academic service, and research. Some of the universities have undertaken research and academic service on biodiversity with their existing networks and research centers, including respective agencies for the conservation of

biodiversity of such as plants, insects, and aquatic animals. Regarding capacity building in terms of access and sharing of benefits of biodiversity, the universities have studied the utilization of biodiversity in many aspects and promote people's access and sharing of benefits in a worthy way without damaging biodiversity. As stated by Rebecca M & et.al. (2014), human needs to value biodiversity as it should be conserved as a source of benefits for humankind and for its beauty with spiritual and cultural values. It is considered a cultural heritage to pass on to the following generations so as to prevent the damage and loss of biodiversity of any particular species. Problems related to biodiversity require people to understand, realize, and take responsible for. Biodiversity is to be reserved and restored for utilizing in many forms such as herbs, food, energy, textile, etc. Rules and regulations are needed for the maintenance, conservation and rehabilitation with respect to the access and utilization of those resources. In similar, for the use of ecosystem and biodiversity in other forms, other than the government sector or scientists, people have to be provided with knowledge and understanding about the worthily use of biodiversity and the effect of using it in various ways.

3.2 The result on the weaknesses of university management according to the concept of capacity building in biodiversity of Thailand involved the management of graduate production. Today, university management of instruction on biodiversity is specific to certain subjects while it is lacked of curriculum development that integrate between subjects and identify it as a subject in general category that allows students in other programs to study. It is in this way that biodiversity awareness can be raised and its value and effectiveness can be developed as part of the sustainable conservation and rehabilitation of biodiversity. For capacity building with respect to the development of biodiversity values and the conservation and development of biodiversity, university management to produce graduates with capacity in development of biodiversity value are still less likely just as in the research and academic service. In Thailand, biodiversity values were less developed when comparing to the unworthily use of it without development. As suggested by the Institute of Thai Traditional Medicine (2014), poverty reduction by means of utilizing biodiversity requires an increase of environmental resources as well as the restoration of ecosystem in many areas and systems of the poverty sites. Despite the conservation of biodiversity in the past, it should focus more on restored and increased biodiversity at present. The survey revealed that the areas with high level of biodiversity were accompanied with high level of poverty too. This means that biodiversity was neither well utilized and worthily utilized nor shared on a fair basis. If people are allowed for their access and best use of biodiversity, poverty can be partly solved. In the development of biodiversity values in Thailand with high level of biodiversity and the diversity of resource base for development, however, if without technologies for its extension, the economic gain would be limited or the resources would be finished. The use of herbal plants from the forest, for example, if without technologies for propagated species or transplantation to substitute forest herbs, those herbs might extinct (Institute of Thai Traditional Medicine. 2014).

3.3 The result on the opportunities of university management according to the concept of capacity building in biodiversity of Thailand involved the management of academic service, and research with respect to government policy, economic

situation, and technologies. The government policy encourages universities to do the research and studies on biodiversity, with economic situation supportive to the research that leads to the development of biodiversity values for communities. Social situation also takes part in promoting research and studies as well as academic service for the development of biodiversity values. The present Thai society has become well aware of biodiversity development for its contribution to social development. In similar, technologies today enable research and studies in biodiversity values development. As described in the strategies of London College of Fashion 2013-2016, the management of integrated biodiversity and tourism is based on the sustainable and balance development of environmental, economic, social, and cultural aspects of tourism. The principles for this include the use of ecosystem of biodiversity as the key element of tourism development; conservation of biodiversity as the natural heritage; giving respect to the social integrity and culture of community and conservation of what created by the community as well as cultural livelihood as cultural heritage and traditional value, and understanding the differences across cultures; monitoring economic operation to ensure fair distribution among stakeholders in the society and community that secure their employment opportunities and income, and reduce poverty. Tourism development must involve all stakeholders and relevant information for broader participation and commitment so as to achieve sustainable development. Tourism is an ongoing process and requires ongoing investigation of its impacts in order to place preventive and corrective measures as deemed necessary. Sustainable tourism should not only maintain the satisfaction and ensure meaningful experience among tourists, but should also create their awareness on the problems posed by tourism on sustainable development and promotion, so that sustainable utilization and conservation of biodiversity can be possible.

3.4 Result on the threats of university management according to the concept of capacity building in biodiversity of Thailand involved the management of graduate production with respect to the government policy, economic situation, social situation, and technologies. Based on the suggestions on management of graduate production, the government policy on educational management did not focus on increasing the number of students, courses, and instructors. In economic aspect, the production of graduates required specialized instructors and the integration of financial provision which is less in this area. In social aspect, for those who graduate specifically in this subject, there are very few agencies to support their jobs. In the light of this situation, there should be an integration of disciplines so that the graduates will be capable of working effectively in the development of biodiversity values. Regarding technologies which are very expensive, it is very costly for the budget in providing technologies for teaching and learning. Moreover, capacity building in biodiversity has to take into account technologies, social and economic situations, and the government policy also needs to be improved to enable the graduates in their building of capacity in biodiversity. Similarly to those organizations in Europe, strategies on biodiversity were identified which included implementing activities for management networks to facilitate biodiversity; mobilizing enough funds to support the implementation for biodiversity; raising public awareness on biodiversity; revising relevant laws; using information technology to develop and

update the database on biodiversity and laws; formulating the plan to evaluate economic cost and benefit from the use of biodiversity resources on the EU ecosystem, with economic gains from products without damaging environment ; providing information to users; establishing operation system of the EU to improve cooperation in reducing adverse impacts on biodiversity. In economic aspect, the Economic of Ecosystem & Biodiversity (TEEB) pointed out the expense for restoration of the loss, and the failure in executing measures on the conservation and rehabilitation of biodiversity.

4. University Management Strategies According to the Concept of Capacity Building in Biodiversity of Thailand

The result offered 3 main strategies and 9 sub-strategies as follows. Main strategy 1 is the reform of university management of graduate production and development according to the concept of capacity building in biodiversity of Thailand comprising 3 sub-strategies: 1) Development of learning management process in access and benefit sharing of biodiversity; 2) Management of learning to establish involvement in the conservation and rehabilitation of biodiversity; and 3) Management of learning to develop the values of biodiversity. Main strategy 2 is strengthening university management according to the concept of capacity building in biodiversity of Thailand comprising 3 sub-strategies: 1) Promotion of research process in the access and benefit sharing of biodiversity; 2) Development of university management of research in conservation and rehabilitation of biodiversity; and 3) Integration of research on the development of biodiversity values. Main strategy 3 is upgrading university management of academic service according to the concept of capacity building in biodiversity of Thailand comprising 3 sub-strategies: 1) Establishment of management process for academic service in the access and benefit sharing of biodiversity; 2) Strengthening the management of academic service in conservation and rehabilitation of biodiversity; and 3) Expansion of opportunities and establishment of involvement in academic service in the development of biodiversity values. It accords with the strategic plan on biodiversity provided by the University of Sheffield that the government as signatories must create and enforce national strategies and action plans to conserve, protect, and enhance biodiversity. The University of Sheffield had identified biodiversity action plan aiming to deliver the national strategies to the local level to take action to protect these resources which include important wildlife species and habitats by planning for conservation, rehabilitation and worthily utilization of the resources. In addition, the University of Manchester, with its management strategies on biodiversity, had formulated the policy regarding sustainable management of environment, with its policy on biodiversity aiming to 1) oversee and implement the biodiversity targets contained within the environmental sustainability plan; 2) establish collaboration among experts to investigate and develop biodiversity; 3) promote teaching and learning, research on biodiversity; 4) identify specific measures to oversee and manage with respect to biodiversity; 5) study the key species and habitats taken as the database; 6) promote activities that link with the importance of biodiversity in the university; 7) connect university activities with other biodiversity-related strategies; and 8) engage local communities with biodiversity and biodiversity research through public events. It also

agreed to the strategies suggested by the London College of Fashion 2013-2016 on integrated management of biodiversity and tourism based on sustainable and balance development on environmental, economic, social and cultural aspects of tourism. Its principles include 1) the use of ecosystem of biodiversity as the key element of tourism development; conservation of biodiversity as the natural heritage; 2) giving respect to the social integrity and culture of community and conservation of what created by the community as well as cultural livelihood as cultural heritage and traditional value, and understanding the differences across cultures; 3) monitoring economic operation to ensure fair distribution among stakeholders in the society and community that secure their employment opportunities and income, and reduce poverty. For those universities in Ecuador and Flanders, they established cooperation between universities and governments to develop strategies that focus on biodiversity for higher education and combating poverty, and linked between country strategy and national strategy for improving quality of life by prioritizing biodiversity and natural resources, education, health, and cultural process. The country strategy was developed as a road map for future cooperation of Ecuador with 20 partner countries started in 2012 including Congo, Cuba, Uganda, Tanzania, Vietnam, and in 2013 including Ethiopia, South Africa, Burundi and Suriname. They aimed to build together a new society by focusing on biodiversity study for health and cultural process, migration, biodiversity resources, and building cooperative networks with institutions in the country to improve the quality of life in the southern Ecuador on basic preventive health care.

Moreover, the Loughborough University (2009) set out biodiversity strategies as part of its sustainable development plan that incorporated biodiversity development in their work and linked with the locality for enhanced biodiversity in the UK. The Convention on Biological Diversity signed at the Rio Earth Summit in 1992, was the first treaty to provide the legal framework for conservation, rehabilitation, and development of biodiversity for sustainable use. Accordingly, the university defined its strategies as follows: 1) to preserve and restore biodiversity that links with the quality of life in staff's working and learning; 2) to utilize biodiversity; 3) to extend opportunities for research; 4) to link work experience with the environmental-related courses; 5) to require established agencies for biodiversity conservation and linking with local community and various organizations; 6) to raise awareness of biodiversity for its benefits and sustainment for future generations; 7) to engage people to contribute to the achievement of goal for sustainable development.

University serves as a key part in developing the body of knowledge, extendedly implementing and transferring the knowledge through websites and other publications to enable the learning, as well as worthily use of resources in ecosystems. Biodiversity is vital to human and ecosystem as it brings wellness and healthiness to life from utilizing it in various forms as foods, medicines, and materials in a range of products for economic gains. Biodiversity offers chemical absorbers to keep water clean as well as air pollution absorbers. Biodiversity provides tremendous benefits to human.

Recommendations

This research on university management strategies according to the concept of capacity building in biodiversity of Thailand provided 2 major aspects of recommendations, i.e. recommendations for utilization of research result, and recommendations for further research as in the details follow.

1. Recommendations for Utilization of Research Result

1.1 The executives of higher education institutions and related organizations of education provision, academicians, researchers, experts or community leaders can use the proposed research framework to identify their policy on research, academic service, and graduate production to enable their management in support of biodiversity development in Thailand. This will in turn improve the local capacity in generating income for community and locality.

As suggested by the research finding, the conceptual framework for enhanced biodiversity obtained from the synthesis of concepts provided by specialists can be adapted to determine university management policy and define course curriculum, research issues, and academic service to the community. Expansion of knowledge is thus fostered in corresponding to the university operation that focuses on developing ecosystem to produce the quality of life, natural and environmental balances.

1.2 The executives of higher education institutions and related organizations of education provision can adopt these strategies to identify policy for the development of research and academic service that represent the university image in promoting the access and utilization of biodiversity, conservation and rehabilitation, and development of biodiversity values through research and academic service.

As suggested by the research finding, the strengths and opportunities involved research and academic service for capacity building in biodiversity of Thailand. Therefore, universities can bring these strategies into practice by their missions on research and academic service that intend to promote effectively use of the rich resources in Thailand, embed good culture among students, and enable their management, extension, and use of the body of knowledge for economic benefits of the communities and localities and for better society and environment.

1.3 The executives of higher education institutions and related organizations of education provision can adopt these strategies to identify policy for the development of research and academic service that increase university competency and effectiveness in biodiversity capacity building.

As suggested by the research finding, the 4 external environmental situations in government policy, economic, social, and technology aspects served as opportunities for university's research and academic service. They thus partly reinforce the research and academic service to facilitate the access and benefit sharing, conservation and rehabilitation, development of biodiversity values, and worthily utilization for the benefit of human wellbeing.

2. Recommendations for Further Research

Based on the above-mentioned findings and discussion, to attain the goal of enhanced biodiversity of Thailand and to extend the result of the current research, further research issues are recommended below.

1. Research should be conducted to investigate the model or system of educational management that integrates among disciplines for capacity building in biodiversity of Thailand which serves to resolve the problems in the loss of species, unfair access and benefit sharing of biodiversity.

For this research, it did not focus on the management model of education provision that supports the capacity building in biodiversity.

2. Research should be conducted to explore university management to promote competition in biodiversity of Thailand as a way to develop universities with competency to increase opportunities for better quality of life and environment from their management of increasing economic values of biodiversity resources.

For this research, it intended on university management in overall for the capacity building in biodiversity with respect to graduate production, research, and academic service.

3. Research should be conducted on capacity building in biodiversity, classified by the context of universities in each type.

For this research, it aimed to explore the overview of universities rather than examine by their individual types.

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References

American Museum of Natural History. (2005). *What is Biodiversity?,* Retrieved 18 May 2015 http://www.amnh.org/our-research/center-for-biodiversity-conservation/about/what-is-biodiversity.

Butchart S.H. and others. (2010). *Global Biodiversity: Indicator of Recent Declines* Retrieved 12 May 2015 http://www.ebcc.info/wpimages/other/ Butchart_ Science2010.pdf.

Carsten Rahbek. (2010). *The biodiversity crisis: Worse than climate change,* Retrieved 1 May 2015, from University of Copenhagen http://news.ku.dk/all_ news/ 2012/2012.1/biodiversity/.

Certo, S. C., & Peter, J. P. (1995). *Strategic management : concepts and applications*. Chicago, Ill.: Chicago, Ill. : Irwin.

Charoenwit Harnkaew. (2010). *Biodiversity Resolves the World Life Crisis*. Department of Environmental Quality Promotion, Ministry of Natural resource and Environment. Bangkok.

Cohab. (2010). *Climate Change, Biodiversity, Conservation, Disease Burden And Environmental Management Emerging,* Issues Retrieved 1 May 2014 http://ueab.ac.ke/BIRJ/download/birj_articles_2015/2015_CONFERENCE_14. pdf.

Convention on Biological Diversity Belgian Clearing House. (2014). Convention on Biological Diversity Retrieved 23 April 2015 https://www.cbd.int/chm/network/

David, F. R. (2007). *Strategic management* (11 ed.). New Jersey: Prentice-Hall, Inc.

European Commission Environment. (2015). *Global Diversity*. Retrieved 13 Jan 2016 http://ec.europa.eu/environment/nature/biodiversity/international/index_ e n.htm.

ICSU. (2015). *The International Council for Science and Climate Change: 60 years of facilitating climate change research and informing policy*. Retrieved 1 May 2015, from International Council for Science http://www.icsu.org/publications/ about-icsu/ the-international-council-for-science-and-climate-change-2015/the-international-council-for-science-and-climate-change-2015.

Koontz, H., & Weihrich, H. (1990). *Essentials of management*. New York: New York : McGraw-Hill.

Kotler, P., & Murphy, P. E. (1981). Strategic Planning for Higher Education. *The Journal of Higher Education*, 52(5), 470-489. doi: 10.2307/1981836.

Martina Gebhardt. (2001). *Sustainable use of biodiversity by the pharmaceutical industry?*. Retrieved 12 May 2015 http://www.inderscienceonline.com /doi/abs/10.1504/IJSD.1998.004203.

Meerod et al. (2011). *Networking of R & D institutions for enhancing iovnnation strategies and approaches in thailand.* Retrieved 1 May 2015 http://techmonitor. net/tm/images/9/9c/11jul_aug_sf4.pdf.

Newby, Stepich, Lehman, & and Russell. (2000). *PIE Model*. Retrieved 13 July 2013 from Instructional DesignEDTC 6321-01 http://gabrielaseportfolio.pbworks. com/w/file/fetch/84314740/PIE%20model%20and%20ADDIE.pdf.

Okoche M. and Michael J. (2013). Strategic Organization for Competitiveness in East African Universities. *Strategic Organization*, 5(20).

Owen, J. M. (1993). *Program Evaluation forms and Approach*. Sydney: Southwood Press.

Pruet Siribunpitak. (2010). *Management for Sustainable Development: The Basis of Education in Economic, Social, and Environmental Aspects.* Bangkok: Thai Sampun.

Rothwell, W. J., & Kazanas, H. (1992). *Mastering the Instructional Design Process: A Systematic The Jossey-Bass Management Series.*

Sanit Aksornkaew. (2013). *Thailand Excessively Use of Diversity*. C-Reporter, http://www.citizenthaipbs.net/node/1290 Online 12 July 2014.

Somsak Punha. (2015). *Biodiversity is the Selling Point of Thailand.* Manager Online, http://www.manager.co.th/Science/ViewNews.aspx?NewsID=9580000001728O nline 12 May 2015.

Somsak Sukwong. (2015). *Knowledge on Environment, Department of Environmental Quality Promotion.* https://web.ku.ac.th/schoolnet/snet6/envi1/bio-frst/bion.htm Online 12 May 2015.

Sasin Chalermlarp and Wannobon Kuan-Arch. (2011). *The Project on Integration of Biodiversity Values towards Guidelines for National Resources Management in Thailand: Forest Ecosystems.* Seub Nakhasathien Foundation.

Sudayuki S. and others. (2011). Business and Biodiversity Study Group Gaining business competitiveness through biodiversity conservation. Retrieved 13 October 2015, from Council on Competitiveness-Nippon (COCN) http:// www.cocn.jp/ thema45-E.pdf.

Teeb (2008). *The Economics of Ecosystems and Biodiversity*. Retrieved 1 May 2015 http://www.teebweb.org/.

Thai Traditional Medical Institute. (2014). http:/ittm-old.dtam.moph.go.th/data_articles/t11.htmOnline 12 July 2014.

Thomas Paul Husband & David H. Abedon. (2013). B*iodiversity Certification Model: A Partnership Approach to Strengthening U.S. Competitiveness, Internationalization of Curricula, and Sustaing Biodiversity*. Retrieved 1 May 2014 https://www.researchgate.net/publication/261062719_Title_Biodiversity_Certification_Models_A_Partnership_Approach_to_Strengthening_US_Competitiveness_Internationalization_of_Curricula_and_Sustaining_Biodiversity.

UNCED. (2010). Retrieved 25 May 2015, from Australian Government Department of the Environment https://www.environment.gov.au/sustainability/education/publications/conserving-australias-biological-diversity-teachers-notes.

University of Sheffied. (2014). *Biodiversity Action Plan,* Retrieved 1 May 2014 https://www.sheffield.ac.uk/polopoly_fs/1.246719!/file/bap.pdf.

University of the Arts London. (2013). *University of the Arts London Biodiversity Action Plan 2013-2016*, Retrieved 1 May 2014, from University of the Arts London http://www.arts.ac.uk/media/arts/about-ual/sustainability/Biodiversity-Framework-for-UAL-v3.pdf.

University of Worcester. (2014). *Biodiversity*. Retrieved 1 May 2014 http://www.worcester .ac.uk/discover/biodiversity.html.

Wheelen, T. L., & Hunger, J. D. (2012). *Concepts in strategic management and business policy*: Pearson Education India.

World Wide Fund for Nature Australia. (2550). Retrieved 1 May 2015 https://www.google.co.th/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=world%20wide%20fund%20for%20nature%20(wwf-australia).

Yamane. (1973). *Statistic: An Introductive Analysis*. New York: Harper and Row Publisher.