



The Development of Appropriate Universal Design Model in Muang Phitsanulok to Support Economic Growth, Society and Tourism

Chot Bodeerat, College of Management and Local Development at Pibulsongkram Rajabhat University, Phitsnuluk Province, chotbodeerat@psru.ac.th

Yuvadee Phongrod, College of Management and Local Development at Pibulsongkram Rajabhat University, Phitsnuluk Province

Nanthaphan Khodkhong, College of Management and Local Development at Pibulsongkram Rajabhat University, Phitsnuluk Province

Supattra Charoenphukdee Bodeerat, Faculty of Science and Technology at Pibulsongkram Rajabhat University, Phitsnuluk Province

Abstract- The objectives of this research were 1) to study factors affecting the appropriate development of universal design model, 2) to take Global Positioning System (GPS) or Landmaps to make appropriate universal design data, and 3) to study the appropriate universal design model for Muang Phitsanulok District for the economic growth, society and tourism. For the quantitative research, the research team utilized questionnaire by using Taro Yamane's table with the reliability of 95% and error of $\pm 5\%$. The samples were 400 participants. In terms of interviewees by purposive sampling were as follows: 1) 3 interviewees from Tourism Authority of Thailand in Phitsanulok, 2) 3 interviewees from the Office of Social Development and Human Security of Phitsanulok, 3) 19 interviewees from Local Administrative Organization of Phitsanulok and 38 participants from focus group discussion. The data were analyzed by employing mean, standard deviation. The findings were as follows:

1. Factors affecting the appropriate development of universal design model overall were at a high level and when considered by items, it was found that the highest mean was understanding, perceptible information, followed by the easy application, flexibility, equity on application, physical relief, appropriate working space, and safety.

2. Taking Global Positioning System (GPS) or Land maps to make appropriate universal design data for Muang Phitsanulok District, it was found that the access of GPS or Land maps to make the data from 25 government offices and private sectors and Wat Phra Si Rattana Mahathat was accessed the most because of being very important tourist attraction of Phitsanulok which is standardized in terms of design and universal design supporting the economic growth, society and tourism.

3. The appropriate development of universal design model should comprise venue, material, everything around us to support social members without specifically designed for certain group, it should be design for all genders, ages, pedestrians or wheel chairs. The mentioned design will focus on ultimate usefulness for mutual society without any limit such as the ramp and venue for wheel chair users, or block path for the blind for their convenience and safety.

Keywords: development, universal design model, economic growth, society and tourism

I. INTRODUCTION

The present global current has given importance to human rights which should be equitable and equalized regardless of genders, ages, physical conditions and it is the dynamic of the world current retrospect the importance of universal design in terms of caring on building, place, public services, and all forms of public transportation by making aware of convenience, safety, up to date, righteousness. It can be stated that universal design is an internal language of the people nowadays and in the future that mention the things which will assist the quality of human beings on the basis of well-being and safety.

For Thai society, the universal design has been started because it is heading for the aging society due to the fact that the birth rates become less each year and it is found that many more wheel chair users are present. It also becomes part of ASEAN and supports the people of ASEAN and overseas, as Thailand is the tourism hub of ASEAN, therefore, it is vital to have universal design responding to problems of all genders, ages, wheel chairs users, pedestrians who are very much important for our economy. In recently, a number of disables, elderlies of Thailand are increasing rapidly and it affects economy, employment, resource management for health and society and nation administration. The people in charge with facilities for disables such as architects and engineers who play important roles in building such things. Life taking in current society, there are various facilities and technology available but inadequately provided for those who are abnormal. From the change of mentioned population structure, it is short preparation supporting the increasing aging people for their well beings. Furthermore, it is consistent with the regulations of the Ministry of Social Development and Human Security in 2012 in that the designation of attributes or provision of facilities or services within the buildings or public services to meet the access and utilization

of the disables. In addition, the Ministry by the Department of Promotion and Development of the Disables, has integrated and cooperated with the network for disables of the Government Public Policies such as the Ministry of Tourism and Sports, the Ministry of Culture, the Ministry of Communication, the Ministry of Interior and organizations for disables in mutually driven model society supporting the well beings of the disables and to build universal designs for every single life in the society.

Nowadays the population structure has been changed from the past, medical technologies are increasing resulted in the prolong life of the people as well as the population structure has entered the aging society. Besides, it results in the daily life model of the illness with more chronic diseases and if it is not appropriately taken care of, it will make the disability in the future. Becoming aging society for Thailand can affect the daily life and human behavior changes rapidly. Therefore, local administrative organizations must increase their roles, authorities and tasks being transferred from the royal acts, plans and procedures of decentralization in 2542 B.E. especially the authority of the local administrative organization in making measurement in providing aging and disables assistance. The universal design is in line with the core of Dhamma in Lord Buddha teaching saying that birth, sickness and dead are common where no one can skip no matters to which caste they belong, rich or poor, elite or low profile, they all die. It can be compared to the national mapping design to be the universal one which everyone cannot overlook and being careless in conducting life because the heart of universal design is for convenience, safety and equality.

From the aforementioned context, it makes research team interested in studying the development of appropriate universal design model in Muang Phitsanulok to support economic growth, society and tourism for both public and private sectors towards the concrete city universal design as well as preparation for the increasing aging and disable problems according to the Royal Kingdom of Thailand constitutional intention in 2560 B.E. which is the important prototypical law that both public and private sectors can proceed the universal design city. Therefore, data and facts gained from this study will benefit the consideration of the public and private sectors in cooperating the preparation of developing the universal design city for Muang Phitsanulok in the future.

Objectives

1. To study factors affecting the appropriate development of universal design model, for Muang Phitsanulok District for the economic growth, society and tourism.
2. To take Global Positioning System (GPS) or Land maps to make appropriate universal design data for Muang Phitsanulok District for the economic growth, society and tourism.
3. To study the appropriate universal design model for Muang Phitsanulok District for the economic growth, society and tourism.

Expected Outcome

1. For the policy benefits, community will benefit this study is that taking it to make state policy and implement into practice by designating the communities in Muang Phitsanulok areas having appropriate universal design by public and private sectors as well as people, community leaders participate in developing the universal designs in Muang Phitsanulok areas to develop the aim: equality and good quality of life for the well-being and happiness for the communities.

2. For academic benefits, ones can take research results to develop in other research by studying the procedure process of community to synthesize successful life implementing plan in developing universal designs in Muang Phitsanulok areas including learning network building for self-reliance both in family level and intra community and inter community. Expanding concept and practice of families and communities are for success in sustainable community development, for national development strategy and support community mechanism driven the strong and wide community knowledge, make learning data cooperatively with the community organizations, academic institutions, and local administrative organizations.

3. For community benefits, it is believed that inequality problems in the society as well as difficult conditions impacted the community strength will minimize and it will result in the strength of economy, society and tourism both in a family and community enterprise levels. Keeping fine culture of the communities for the awareness building foundation cooperatively in the communities towards universal designs in Muang Phitsanulok areas. They will be supported and taken care of by public sectors more in order to elevate the Muang Phitsanulok community organizations to be sustainable learning organizations in the dimension of sustainable universal designs.

II. METHODOLOGY

The research entitled “The Development of Appropriate Universal Design Model in Muang Phitsanulok to Support Economic Growth, Society and Tourism” aims to obtain the data in line with the objectives. The research team has designated the methodology as follows:

Population and samples

The population for this study is 279, 292 people who live in Muang district, Phitsanulok province.

The samples were 400 people who live in Muang district, Phitsanulok province by utilizing Taro Yamane's table with the reliability of 95% and error of $\pm 5\%$, including purposive sampling interviewees from 3 areas as follows: 1) 3 interviewees from Tourism Authority of Thailand at Phitsanulok, 2) 3 interviewees from the Office of Social Development and Human Security of Phitsanulok, 3) 19 interviewees from Local Administrative Organization of Phitsanulok and 38 participants from focus group discussion (2 representatives from 19 Sub-districts).

Research Instruments

The research team uses questionnaire constructed by studying concepts, theories, texts and documentation and related literature on factors affecting the development of appropriate universal design of Muang Phitsanulok to support economic growth, society and tourism. It is divided into 3 parts as follows:

Part I. Factors affecting the appropriate development of universal design model, for Muang Phitsanulok District to support the economic growth, society and tourism, the 5 rating-scale questionnaire is employed which means as follows:

- 5 means the highest level
- 4 means the high level
- 3 means the fair level
- 2 means the little level
- 1 means the least level

By the criteria used in this questionnaire, the interpretations of the criteria (Best: 1993) are as follows:

- From 4.50-5.00 points, it means a highest level
- From 3.50-4.49 points, it means a high level
- From 2.50-3.49 points, it means a fair level
- From 1.50-2.49 points, it means a little level
- From 1.00-1.49 points, it means the least level

Part II. Taking Global Positioning System (GPS) or Land maps to make appropriate universal design data for Muang Phitsanulok District to support the economic growth, society and tourism.

Part III. Developing appropriate universal design model for Muang Phitsanulok District to support the economic growth, society and tourism.

Data collection of focus group discussion is gathered by purposive sampling interviewees from three sources as follows: 3 interviewees from Tourism Authority of Thailand at Phitsanulok, 3 interviewees from the Office of Social Development and Human Security of Phitsanulok, and 19 interviewees from Local Administrative Organization of Phitsanulok and 38 participants from focus group discussion (2 representatives from 19 Sub-districts) for the overall picture of data on the development of appropriate universal design model in Muang Phitsanulok areas.

Testing the research instrument, the research team has checked the quality of questionnaire in 2 facets as follows:

1. Testing validity of the instrument is to test for the precision of the instrument (questionnaire and questions for focus group discussion) to see if they meet the research objectives thoroughly or cover all the contents through meeting with the experts for their comments and suggestions on every item of the questionnaire and then the readjustment according to their suggestions is made.

2. Testing the reliability of the questionnaire by using Alpha Coefficient (Cronbach, 1990: 204) by trying out with more than 30 people who are not the sample group. Then the research team administered the questionnaire to find reliability using the computer.

Data collection: It is conducted with the procedures as follows: (1) Have a meeting among research team to plan. (2) Review the related literatures. (3) Construct the instrument to collect data and test the instrument. (4) Make understanding and coordinate the research unit. (5) Collect data for quantitative study (questionnaire and focus group discussion). (6) Analyze data and conclude the research project and, and (7) Make a complete research report.

Data analysis

Data analysis and process of the questionnaire collected from the sample group is done via descriptive statistics; namely, frequency, percentage, mean, standard deviation to explain the attributes of population and the level of understanding factors and technology (GPS) or Land maps to make data on appropriate universal design of Muang Phitsanulok to support the economic growth, society and tourism by using computer, along with additional analysis obtained from focus group discussion and utilizing content analysis from the group discussion questions according to the research objectives.

III. RESEARCH RESULTS

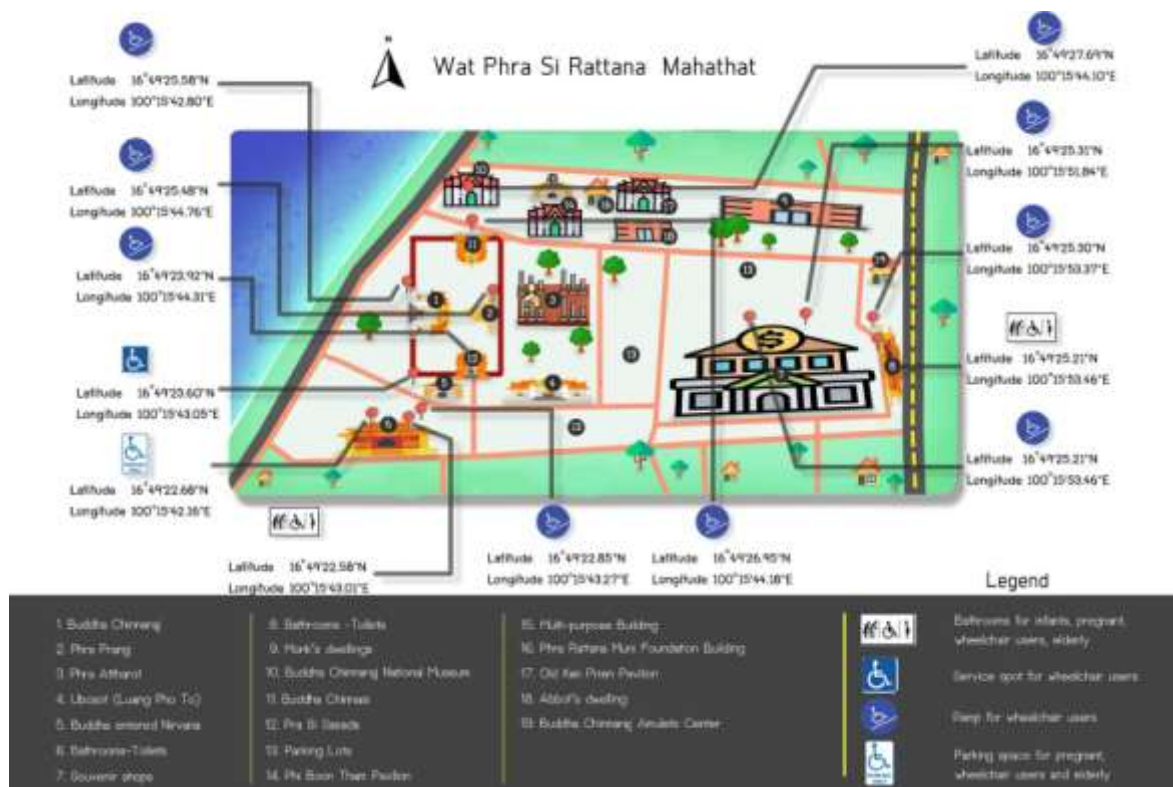
The conclusions of the research based on research questions were as follows:

1. Factors affecting the development of appropriate universal design were, overall, at a high level and when considered by items, it was found that the highest mean was the understanding facet of which contains perceptible data followed by simplicity, flexibility, fairness (equality), energy conservation, space and safety as shown on table 1.

Table 1 Analytical results on the level of factors affecting the development of appropriate universal design model for Muang Phitsanulok areas in 7 facets:

Statements	\bar{x}	S.D.	Means
1. Fairness: equality in terms of utility	3.92	.73	High
2. Simplicity: easy to access	4.06	.71	High
3. Understanding: perceptible information	4.10	.69	High
4. Flexibility: changeability	4.02	.76	High
5. Safety: danger measure and prevention	3.48	.79	moderate
6. Energy Conservation: reduce physical burden	3.86	.68	High
7. Space: venue availability for every physical condition	3.62	.77	High
Total	3.87	.73	High

2. Taking Global Positioning System (GPS) or Land maps to make data on appropriate universal designs for Muang Phitsanulok was found that the places that make use of GPS or Land maps such as Wat Phra Si Rattana Mahathat, City Hall of Phitsanulok province, City Municipality of Phitsanulok, Aranyik Municipality, Sub-district Municipality of Plai Chumpon, Ban Khlong Municipality, Hua Ro Municipality, Tha Thong Municipality, Local Administrative Organization of Sub-district Wang Nam Khoo, Local Administrative Organization of Sub-district Ban Krang, Local Administrative Organization of Sub-district Phai Khodorn, Local Administrative Organization of Sub-district Tha Pho, Local Administrative Organization of Sub-district Wat Chan, Local Administrative Organization of Sub-district Wat Phrick, Local Administrative Organization of Sub-district Ban Pa, Chi Na Pura Hotel, Ruan Phae Hotel, and Wang Chan Riverview, to make data on the most appropriate universal designs and the venue which people access in terms of universal design the most is Wat Phra Si Rattana Mahathat because of being very important tourist attraction of Phitsanulok ; therefore, it results in the design to support the standard of universal design enabling to support the economic growth, society and tourism as shown in the following map.



3.The development of appropriate universal designs was found that it must comprise venues, material, everything surrounding us in supporting the access of social mass in the society without any specific design for certain group regardless of genders, either young or old, pedestrian or wheelchair users, the design should focus on the ultimate utilization for the mutual benefit of societal public without any limit such as the ramp, sidewalk, buildings for wheelchair users or block sidewalk for the blinds so they can spend their daily lives outside with conveniences and safety.

IV. CONCLUSION AND DISCUSSION

The research entitled, **“The Development of Appropriate Universal Design Model inMuang Phitsanulok to Support Economic Growth, Society and Tourism”**, the findings according to study objectives were as follows:

1.Factors affecting the development of appropriate universal design were, overall, at a high level and when considered by items, it was found that the highest mean was the understanding facet of which contains perceptible data followed by simplicity, flexibility (changeability), fairness (equality in terms of utilization), energy conservation, space (fit for all) and safety (having measure in dander prevention) which are consistent withthe importance of universal design of Lalai’s (2013) stating that universal design is inevitably important and needy for a current world and future with 5 reasons as follows:

1.1.The aging will outnumber over the world, so currently many countries if this world, Thailand with no exception, is entering the aging society, human beings will live longer and require variety of facilities for their conveniences and safety much more to live daily life.The data from United Nations indicate that the population of the world is more than 7,000 million people: the people over 60 years of age is about 893 million people or 12.8%.In that number, there are people with over 100 years of age more than 340,000 people and the trends seem that the population will increase around 200 million people within the next 10 years, that means within the year of 2022, the population of the world will be over 1,000 million people.

1.2.The world population will have more disables, so they or those who require facilities in the current world and in the future will be increasing since their disabilities are not from birth but from the illness, accidents or from their senilities.

1.3.Enacted law, currently, the affluent countries like Japan, America, England, Germany etc. have issued the law to have public venues, buildings provided conveniences for all; however, within 15 years, Thailand has enacted the laws implementation such as the promotion and development of lives for disables law, the regulations of Ministry of Interior in 2005 and the regulations of Ministry of Social

Development in 2013 in effective to the design of buildings and every single public place is required universal design that is they have to provide varieties of facilities for disables and elderly as well.

1.4. Global regulations, universal design is the universal language and regulations of the current world and future as they can be seen that the affluent countries even some of the developing countries should have these things; therefore, universal design is one of the indicators to measure the country prosperity. In addition, Thailand has joined the ASEAN, we have to be well aware that if we still do not have no universal design reform or develop our country, we will not be recognized in the world arena because we do not only take good care of disables and the elderly as well as the recovered patient but also violate the basic right of the humans so we will be seen as the underdeveloped or uncivilized country.

1.5. It is in line with the Dhamma core in Buddhism which our Lord Buddha once said birth, aged, sickness and dead is common; nobody can avoid it regardless of which caste we are in, poor or rich, tall or short, black or white so designing the country having universal design to show the carefulness of leading the life and it will actually benefit all people. Because some day we ourselves might rely on this universal design. The key of universal design relies on “the convenience, safety, fairness, for all and equity”; that is, the development of basic structure in supporting every group equally including the elderly and disables, according to the using behavior such as direction posts with the symbol for the blind, the ramp and public bathrooms for the wheelchair users. The aforementioned concept is consistent with Rattanaburi’s (2009), who studied the factors affecting the success on One stop service into practice. Owing to the one stop service is provided for public service focusing on building the system for the effective officer’s operation. This emphasizes the public need with high satisfaction. This also accords with Chayabut’s (1993) who showed his perspective on One stop service to public service in that it facilitates convenience for people who come for the service spending with the least time as much as possible.

2. Taking Global Positioning System (GPS) or Land maps to make data for appropriate universal design for Muang Phitsanulok, was found that Wat Phra Si Rattana Mahathat makes use of GPS or Land maps for universal design for people to access the it the most due to the fact that this temple is one of the important tourist attractions of Phitsanulok. The universal design is standardized to support the economic growth, society and tourism which is consistent with the research of Charernra, Masalong, Boontem and Thongthep (2017), who studied information technology system on design management for mass people in Thailand: Thai well-being by analyzing University Design (UD) and developing it for the information system for Thailand. The mentioned system is the application web focusing for the physical disables, disable caretakers and everyone enabling to lead their life in the society equally by searching facilities or services in line with each person’s environmental needs conveniently, and rapidly. In terms of system, the people can be divided into 10 categories such as alternative genders, the blind, disables with wheelchairs, disables, people with pets, Muslim, children, elderly, novice and monk and pregnant ladies. The research results will support tourism in Thailand and elevate the quality of life for the disable, elderly and everyone can access these things more conveniently and rapidly as stated in the Bill of supporting and developing the quality of life of the disable in 2550 B.E. Act 37 enacted the regulations of the Ministry to issue the attributes or providing facilities or services in the buildings or public venues so support the disable to utilize those areas thoroughly and fairly according to the concept of Mamee’s (2011), who studied the design criteria of public toilet design for the disable under the “Design for Mass people” to find the model on design and developing public toilet for the disable who cannot walk and for general toilet users with the same standard and meeting everyone’s needs with the awareness of safety and equality.

3. Development of appropriate universal design, it was found that the appropriate universal should comprise venues, materials, everything around us supporting the use of social members without any specific design certain group of people regardless of genders, young or old, walkable of wheelchair users, the mentioned design should focus the ultimate utilization for mutual society without any restriction such as ramp, sidewalk, buildings for disable with wheelchairs or blocked sidewalk for the blind so they can lead their lives outside more conveniently and safely which is in line with the concept of Jarurat and Thong Art’s (2014), who showed the interestingly perspective on the important universal design in 7 types as follows:

3.1. Thinking of equitable use, that is, everyone in the society can use whatever being offered equally without discriminating for different ages and abilities such as designing counters with different levels for wheel chair users or small children conveniently.

3.2. Thinking of flexibility in use; that is, the ability to change for the use by designing for various users both right or left-handed people and facilitate the users according to their mobilities.

3.3. Thinking of simplicity and intuitive use; that is, using the pictures as for universal symbols and easy to understand, simple design, easily accessible without any language knowledge or expertise

such as indented telephone cards for the blind to feel on which side they should insert or the reaching machine as JIS (Japanese Industrial Standards) and the use of the pierce or holes.

3.4. Thinking of the perceptible information; that is, provide simple information without so much of physical perception. The design should have symbolic sign or color contrasting with the surrounding environment with a variety of channels such as pictures indicating how to use sanitary wares, brail and sound.

3.5. Thinking of tolerance for error; that is, having error prevention system in the usability with the least danger. The design should minimize the danger or unprecedented accident or prepare utility for safety such as scissors with sheath and can cut paper and usable with different surface types prior to the ramp and rails.

3.6. Thinking of low physical effort; that is, convenient without using much force such as the plugging in or out which require only punching for pressing the tip of equipment to help inserting the plug easily.

3.7. We should be aware of size and space for approach and use; that is, they can be seen regardless standing or sitting on the wheelchairs, easily accessible for the hand reach without any physical constraints or mobility such as appropriate size the disabled bathrooms, wheelchair users having enough space for them to turn around which is consistent with Khowkhachaporn's (2014), who studied on universal design, from the summary of the administrator, it was found that the universal design is the design, developing basic structure, various services, products to support every single group of social members regardless the elderly, disables, or those who can lead their daily lives differently from others with the physical constraints. The key concept of design is the convenience, safety, fairness, thoroughness, and equality in leading daily life and more importantly such places regardless of building construction and or various facilities should be created for the mutually utility.

V. RECOMMENDATIONS

Suggestions for applicability: The research entitled "The Development of Appropriate Universal Design Model in Muang Phitsanulok to Support Economic Growth, Society and Tourism" was found that there are appropriate universal designs to support economy, social and tourism regarding the car parks for disable/elderly, number of toilets, counters for wheelchair users and elevators designed and constructed with standard and safety with easy access, having signs, symbols to convey regarding Thai and English, universal language including Chinese. The related agencies should support the development continuously for the standardization and confidence meeting the users' satisfactions. More importantly, the related agencies should support and develop in terms of the basic structure developing design and products to support every single social member equally regardless specifically for elderly, disables, children, women or those who lead their daily lives different from general people though they have physical constraints including foreigners from scores of countries; therefore, communication, language use, clarification, safety and the standard should be prioritized.

Suggestions for further study: (1) There should both quantitative and qualitative research with larger target group in order to obtain database to support the findings and a variety of perspectives resulting the practical achievement concretely. And **(2)** there should be problems, difficulties, and models on development of appropriate universal design in Muang Phitsanulok to meet more public needs.

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