



Social Collaborative Design: Creating Knowledge base in Sustainable Development

Apinya, Limpaiboon

Lecturer, School of Architecture and Design, King Mongkut's University of Technology Thonburi
(Thailand),

apinyalimpaiboon@hotmail.com, apinya.lim@kmutt.ac.th

Abstract

Mattayom Praratchatan Nayo School (MNY) was classified as an underdeveloped rural school in Chachuengzao province, Thailand. It was established in 1997 under the financial support from HRH Mahajakri Sirindhorn. With a collaborative partnership of MNY, King Mongkut's University of Technology Thonburi (KMUTT), and National Center for Genetic Engineering and Biotechnology (BIOTEC), the school has developed an integrated resource development curriculum following the directive to strengthen its educational quality using sufficient economy despite limitations. This paper presents a current actual collaborative project between school communities, design professionals, educators and design students to steer the school's physical development plan towards sustainable concept. The project aims to develop lifelong learning to all participants through socio-environment based learning, which incorporates local wisdom with design & technology. The project, further utilizes the existing resources, such as forest, rice field, and fish ponds, to create the school's master plan for sustainable site design. The designs were developed by university students working alongside MNY students and teachers. Through the social collaborative design process, the school has successfully upgraded its understanding and commitment in utilizing land uses whilst preserving its environment. At the same time, participating university students and professionals have developed their skills in addressing problems, needs and solutions from community-defined perspective.

Review of Social Involvement in Design and Planning

Nowadays, Sustainable development is a critical issue, which most countries, including Thailand, are trying to conduct their growth towards, on their own context and agenda. To achieve the sustainable development, three integral issues which are environment, economic and social must be accessed and developed together in balance. Although social collaboration is one of the key successes in balancing the system, it is the most difficult task for any sustainable society to overcome. Social collaboration could be proceeded by different means during different development stages. The ultimate goal for sustainability is to include social collaboration in every possible step it takes.

The degree of social involvement, commitment and responsibility (participation degree), refer to eight ladders of participation in planning (Arnstein, 1969), which are, partnership, delegated power, citizen power, informing, consultation, placation, therapy and manipulation. However, the ladder of participation are ordered more upon the power of citizen in decision making, not upon collaborative degree from the most to the least collaborative. In *"Theory and practice of Transformational Collaboration"*, Himmelman (1996) had defined the word "Collaboration" as "exchanging information, altering activities, sharing resources, and enhancing the capacity of another for mutual benefit to achieve a common purpose". He further recommended that partner, rather than collaborator, is a better way to describe participants. However, it has been remarked that the full model of collaboration is very complex. This project defines collaboration (which means "working together" in its Latin root), as a strategically process with participants degree is set to be in the form of partnership (working side-by-side) and/or consultation (sharing, discussing ideas, information) in the collaborative process.

From basic workflow of design process (Fig.1: Integrating Social-collaborative into Design Process), there are 7 steps from objective setting, data gathering, analysis, concept forming, schematic design, evaluation, and design development. Step1-2 can be called pre-design stage, step 3-7 called design stage, step 8-9 called post-design stage. In Thailand, there has been a continuous attempt to involve social factor in a process of design, but mostly on data gathering stage. Designers/planners use social interaction techniques, such as interview, observation, questionnaire, casual talking, and/or public meeting to involve communities in pre-design or pre-planning stage. Some projects with their nature relevant strongly with social context (such as urban planning project) might be forced to extend their social involvement to the design stage, but mostly only in the model of Public hearing and Public reviewers to get feedback from communities. In planning, since 1996, people participation in government project has been enforced by Administrative Procedure Act in some degrees. At present, direct participation is included in the pre-planning stage with the Public meeting/explanation, questionnaires, News announcement techniques, and in the planning stage with the Public hearings and Public review techniques (Pimonsatean, 2004). Still, the roles of stakeholders in practice of most projects are information provider, requirement setter and/or reviewer as they are directly affected by the design. This could be understood as "social as user and/or client" in the design process. This project further demonstrates a model of "social as design generator" which involve social collaboration in every stage of design process. Therefore, the complete cycle of sustainable process from decision making (planning), installation, renovation and maintenance is under the monitoring and responsibility of the communities.

The main objective of this project is to construct an understanding in design for students and teachers of MNY as a tool for initiating sustainable development of the school's physical development plan. Through Collaborative Design (Co-Design) approach, the school is expected not only to be able to utilize the existing valuable resources, but also properly compose new landuse to serve new requirements for upcoming future.

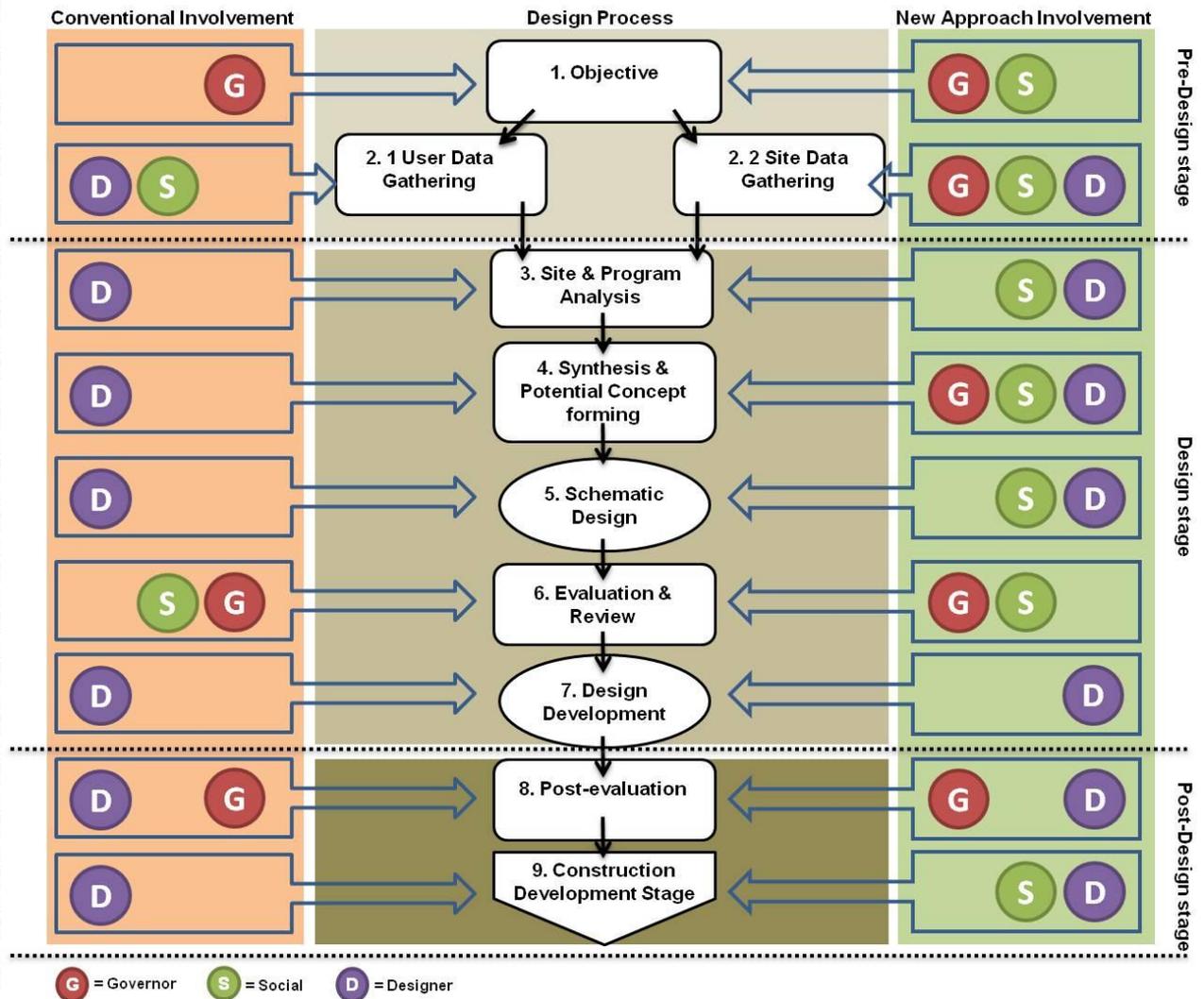


Fig. 1: Integrating Social collaborative into Design Process

The Project Background

Mattayom Praratchatan Nayoa School (MNY), a private school located only 200 kilometres from Bangkok, was classified as an underdeveloped rural school. The school was established in 1997 to serve as a high school for under-privileged students in the rural area of Chachoengsao province under the financial support from HRH Mahajakri Sirindhorn. With a collaborative partnership of MNY, King Mongkut's University of Technology Thonburi (KMUTT), and National Center for Genetic Engineering and Biotechnology (BIOTEC), the school has developed an integrated resource development curriculum in science and technology and other subjects, following the directive to strengthen its educational quality using sufficient economy despite limitations. The school has a total land area of 240 rais (94.8 acres), composing of existing academic buildings, mechanical shops, accommodations and green areas of forest, rice field and fish ponds. When the master plan development project started last year, the school was in a developing stage with a need for new buildings and other facilities to support its growth. The

direction of growth was then taken into consideration with a concern of what and how it should be.

Since 2004, the school and community have practiced on the basis of Sufficiency Economy (SE), which has been accepted as an appropriate medium towards sustainable development for Thais. Sufficiency Economy is a philosophy that stresses the middle path as an overriding principle for appropriate conduct by the populace at all levels¹ (NESDB, 2007). It has been bestowed by His Majesty the King Bhumibol as a guidance for Thais to balance their way of life. It represents the realistic idea of moderation ranges from the ground up. It also enlightens the wisdom and guideline for all Thai people from the toughest time of economy downturn through recovery. It does not deny the globalization or capitalism which driving world economy but respects interdependence among people and nature. Its basic concept stresses on the use of knowledge wisely due to circumstances and consideration. Its core values include integrity, diligence, harmlessness and sharing. Finally, its ultimate goal is seeking to achieve balance and sustainability. Sompit Moi Fusakul and Praoranuj Siridej (2010) have seen Sufficiency Economy Philosophy (SEP) as an alternative approach to sustainability, but remarked that “nevertheless, applying SEP approach in design sector is still relatively under developed”. However, to develop its physical growth accordingly, the concept of SE, the essential elements to sustainability, as well as the school components must be reviewed in order to evaluate the potential growth properly.

Four basic requirements to achieve sustainability without poverty in developed community are:

- Improve and promote knowledge and understanding (knowledge Base)
- Improve marketing strategy and increase production and cash income (Economic base)
- Pursue concerned citizens to participate in any stage of development process (Community base)
- Support local and national policy by good governance (policy base)

The important of “knowledge and understanding (wisdom)” is not only mentioned in sustainability, but also in Sufficiency Economy Implementation as one in two key conditions of success (Siridej & Fusakul, 2010). It is also stated that Sufficiency Economy requires breath and thoroughness in planning, and carefulness in applying knowledge and in implementation of those plans.

The project, were the quest of MNY School to lay out its master plan for building-area expansion and landscape development. The sustainable development of the school as well as community had been discussed to see the possibility and to set the strategy to achieve. Regarding to the MNY School and community components towards sustainable development, we reviewed the relationship of three key integral issues-- environment and natural resources, policy and social aspects. A list of its strength, weakness and potential has brought into discussion. The result implies opportunities or constraints in Collaborative design (Co-Design).

Strength,

- 1) Participants have basic understanding in sufficient economy and sustainability.
- 2) Encouraging of participation of all level is the main policy to develop the school.

¹ Sufficiency Economy is a philosophy that stresses the middle path as an overriding principle for appropriate conduct by the populace at all levels. This applies to conduct starting from the level of the families, communities, as well as the level of nation in development and administration so as to modernize in line with the forces of globalization. “Sufficiency” means moderation, reasonableness, and the need of self-immunity for sufficient protection from impact arising from internal and external changes. To achieve this, an application of knowledge with due consideration and prudence is essential. In particular great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fibre of the nation, so that everyone, particularly public officials, academics, businessmen at all levels, adheres first and foremost to the principles of honesty and integrity. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable to create balance and be able to cope appropriately with critical challenges arising from extensive and rapid socioeconomic, environmental, and cultural changes in the world.[5],
Sufficiency Economy Implications and Applications by Sufficiency Economy Movement Sub-committee

3) There are strong relationship and interdependency between school and community.

Weakness,

1) Stakeholders have less participation in level of decision making or suggestion due to culture and social status in Asian society.

2) Not every stakeholder is aware of the beneficial of preservation and reforestation, although the school policy is to preserving the forest area to 60% of its total area.

3) Decision making of development guideline comes from administrators; the lack of participation from every party might cause the main failure of sustainable development.

Potential,

1) Even though the lack of academic knowledge and professional practice, school and community have high ability to initiate and implement many projects by their own.

2) Ratio of developed area is still low, preventing the conflict of land use, while vast area is still available for future expansion. However the appropriate zoning and site capacity for the next phase of development must be aware.

As the school has developed its education through collaborative partnership with various institutions in many subjects, we saw an opportunity to set up the strategy in designing the school's physical development plan through education, by the collaborative design (Co-Design) between KMUTT, MNY communities, educators and design professionals. This strategy will strengthen Knowledge Base and Community Base as it initiates community's sustainability in learning which leads to lifelong learning and self-dependence in long run. The model of Co-Design activity would allow all stakeholders, who are MNY administrative, students, teachers to be involved, and thus will build their understanding in design for sustainable development of their school.

Knowledge Aspects for the project,

1. Acquire board knowledge in sustainable development
2. Provide knowledge and analytical thinking in physical aspect and site capacity such as opportunities and constraints, pros and cons
3. Provide understanding in decision making process for stakeholders in community
4. Develop student's intellectual, creative and imaginative capacity according to landscape architectural education.

Objectives of the Collaborative Design (Co-Design)

- To provide opportunities for administrators, teachers and head of students to study, participate and practice in sustainable landscape design and spatial/program management which can be applied for other areas/cases
- To develop an understanding in essential elements of sustainable development appropriated to their own community contexts which are resources and environment, macro economics, and community's identity
- To promote the importance of appreciation and awareness in the value of environment and hometown to the participants
- To demonstrate landscape design education for prospect students on how to apply those knowledge to their hometown
- To provide opportunities for students to develop and understanding of the professional practice of architectural design based on sufficient economy theory and to be aware of the influence of 3 essential elements in sustainability development.

- To expand an ability of the students to engage/collaborate with 3 different parties which are local people as stakeholder, students in different field of study and expertise.
- To offer social contribution's opportunity for professionals
- To promote the importance and awareness of an involvement of social in design process

Model of setting Co-Design activity

According to the Public Participation Manual (Siroros, 2003), many different techniques are recommended to apply in three different patterns of participation: Informing, Hearing and, Discussing. The selected technique to initiate discussing and consulting pattern in Co-Design is Training Workshop.

The Co-Design activity of the project was set up through a basic circle model. It was a continuing sequence of stages in circular flow, starting from Review and Analysis of resources and contexts to set collaborative Learning/Working model. This model defined framework of activity as well as collaborative parties and their roles. Then, the activity stage, collaborative parties were learning by doing, they worked side-by-side to propose the ideas. The Outcome was production (result) that was produced in an activity stage. Then, both result and activity were marked the strength and weakness in Evaluation and Refine stage. Consequently, some production may need refinement by a more skillful professional. Finally, the Review and Analysis of the whole process were conducted, which was a starting stage for the next task.

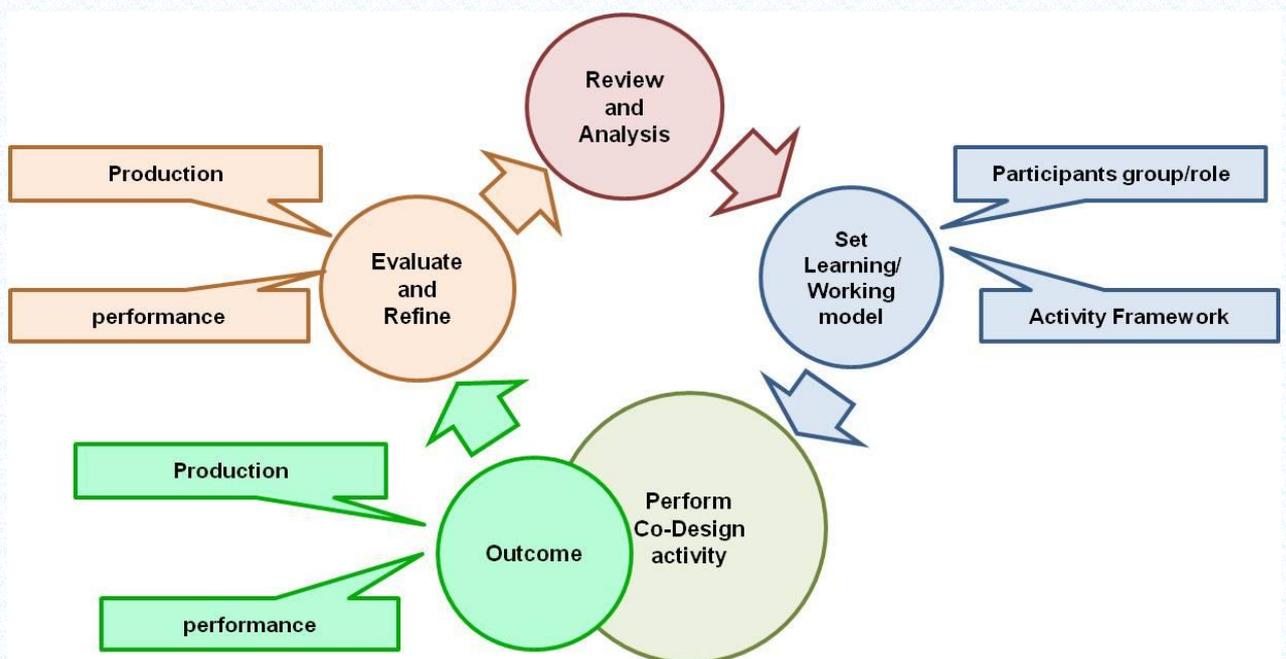


Fig. 2:Model of setting Co-Design activity

The Co-Design knowledge base process is based on the idea of “Learning by Doing”. It will be conducted through workshops with the style of “PLAN without plan”, it means that outline of objectives, working process, and target groups is carefully defined and set, but there won't be rigid schedule or activities for workshop. Along the process, the activity is evaluated from times to times and the schedule or activities will be conducted accordingly by moderator (or consulting

team). The knowledge contents will then be inserted into each stage by brief lecture, comments and conclusion of the activity they have done. So the working model is flexible enough for different group of participants and it will be designed according to their potential, commitment and contribution.

Creating Knowledge Base by Co-Design

For MNY School, we set 3 phases of workshop (WS1, WS2, and WS3) with an intention to involve social participation into every stage of the Design process. The theme of Co-Design workshops is called FUN-FIND-FOCUS to avoid using various Design technical terms in communicating with school community. MNY, KMUTT and BIOTEC, first carefully discussed and set target groups of participants. During the activities, participants' capability, involvement and commitment were observed. After each phase, participants' performance was evaluated in order to plan the detailed schedule and components of the following phase.

WS1 "FUN": The purpose of first workshop was to give basic knowledge in Landscape Design to participants, so they would have some background before design phase in WS2 with Landscape architecture students (LA students). Consulting team was composed of 5 lecturers (experts) in planning, design, architecture, social study, resource management. They played various roles during the activities as lecturer, visitor, moderator, consult or conductor. Community participants are composed of 3 groups of stake holders, 25 MNY students in high school level who live in a village, 5 MNY teachers and school president.

The FUN activity started with brief lecture from KMUTT to MNY communities about definition in design and some basic information about site plan data and investigation techniques, such as scale, map, direction, plan etc, Then the knowledge and practice would be achieved through play + learn exercises such as site survey, brain storming, mind mapping, and informal discussing. Finally, they had produced a zoning map by their own sketch, together they named the zone from voting for most preferable name. It implied that they started to propose the concept and program for each zone.



Fig. 3: WS1 FUN Collaborative activities

WS2 "FIND": The second workshop, by working alongside with LA students, they will depict their vision on to paper. It was the demonstration of how to design systematically from analysis to final production. Consulting team was composed of lecturers from 5 institutions in design with collaboration of 3 experts from Thai Association of Landscape Architects (TALA). They would be advisors and critiques during the analysis and design activities. Academic participants were 50 LA students from 5 institutions who would work alongside with MNY students to purpose the

Landscape Master Plan. Community participants are composed of 25 MNY students, 5 MNY teachers and MNY president; most of them continued their tasks from WS1.

The FIND activity started from a brief background of the site and philosophy of the school by school president. MNY students presented about what had been done in last workshop (WS1), their dream school and the outcome production, which was the sketch zoning plan from their discussion. Then LA students showed the zoning map in 1:2000 and 1:500 scale which they had prepared by CADD from MNY sketch, so it was the first time MNY saw their work in technical drawing map. After that they were separated in 8 groups to work on design, starting from site analysis, site selection, conceptual design and proposed landscape development design of the area they picked. Each group were composed of MNY students, teacher and landscape students from 2 institutions or more. MNY president, lecturers and experts would give comments and critic their work in each stage. Each member in a group had to present the work and how they involved.



Fig. 4: WS2 FIND Collaborative activities

WS3 “FOCUS”: The last workshop is planned to be detail design and installation stage. MNY communities will build the selected area from their design with the help of professionals and contractors. The purpose is to focus their knowledge in refining detailed design and construction, so they will be trained some skills in maintenance.

The FOCUS activity is now on process of setting private sector collaboration both in terms of funding and professional supporting.

Outcome and Discussion

WS 1 “ FUN” : Fun in Knowing, Addressing, Imaging

We have to ask which kind of knowledge is needed to address their identity, their values, and what could encourage them to think about their needs and their dreams and how they can achieve them. The other results we should have from WS1 are we should be able to estimate the participant’s commitment, their learning potential and their abilities in design.

1) Components

The components in WS1 were defined to assure that three issues of sustainability were involved. Preserved forest, agriculture field, and local way of living represented resources (environmental issue). Students and teachers represented user and community (social issue) and school president represented policy, philosophy, and financial resource (economic issue).

2) Collaboration activities

Participants had a chance to practice their observation and thought about their identity, their like and dislike through “FUN” activities as followed;

“Meet your new friends” introduce brief knowledge and definition of site design and master plan to them.

“Show me your school and village” let the students and teachers investigate and observe school environment in details and be able to explain to others.

“Why I like here most” is the practice of analysis and synthesis,

”impossible dream?” allowed the students to dream further from existing context and express through their mind-map,

“Storm your brain” is the brain storming session to practice opinion expression,

“What we will name it”. Allowed them to create concept, and give zoning fit to site on to the map.

3) Review and discussion

In the WS1, the intention of social collaboration model between KMUTT and NMY community was more likely to be coaching system than partnership. The important thing was that they were encouraged to express their thought and speak out their opinion. The role of collaboration parties would take turn from teacher to learner and vice versa in different activates. The school had an opportunity to be a host, a tour guide who knows more than visitors. This would help to create sense of belonging and pride of local identity.



Fig. 5: WS1 Outcome

Compare to critical thinking of design process, WS1 is data gathering, site investigate; program forming, and conceptual design. In addition, we had to insert knowledge background about what was the purpose and definition of Site Design to the participants in between each activity.

The production outcome showed that even though the students were able to understand the site condition and able to propose land use zoning, their graphic communication was limited by lacking of drawing skill. Therefore this minor obstacle was assisted by LA student who reproduced their sketches to AUTOCAD later on.

WS2 “FIND”: Find problems, needs and solutions

We have to ask which kind of knowledge is needed to **put vision into drawing**, and how they can achieve it.

1) Components

Again, the components' role in WS2 was defined to assure that three issues of sustainability were involved. Natural and agricultural land represented resources and value role in development (environmental issue). School students represented owners and design driven (social issue) in designing Master Plan. School president and teachers represented supporter in management and budget in investment and operating plan (economic issue).

2) Collaboration activities

To demonstrate the working process in design and to exchange ideas + skill in team working (creative thinking) with stakeholders. The MNY community was lead step by step through the design process. In this stage, more technical terms in design and planning such as analysis, concept, Zoning map, harmony and contrast, landmark etc., were introduced to educate MNY participants in design. Participants had a chance to practice on group working, sharing ideas and exchanging knowledge through the "FIND" activities as followed;

"Find what are good and bad points" was the exercise of analysis and group discussion to identify problems and opportunities.

"What do we want to do/what we can do" was the practice of group discussion about site selection and concept

"Present your ideas" allowed participants from all levels to talk about their idea.

"Show me your design" allowed only students to propose their solutions while teachers and experts became critics.

3) Review and discussion

In WS2, we observed that there were knowledge and skill sharing between MNY students and LA students according to the changing of role they were responsible. For example MNY students taught LA students about plant ecology and water supply system produced by their own school and LA students taught MNY how to draw and use technical drawing tools in return. During the oral presentation and critic stage, they also shared their point of view and in their part.



Fig. 6: WS2 Outcome

Compare to critical thinking process, WS2 ranges from site and program analysis, conceptual design to proposed development plan. Moreover in WS2 the degree of involvement and commitment of student were encouraged as much as possible.

At the end of WS2, NMY students and participants would understand the whole design process regarding to their experience. Moreover the administrator had more confidence in students' opinion and potential which led to more involvement of decision making in the future development of the community.

In the WS2, the social collaboration model between KMUTT and NMY community was changed to be more partnership system to increase the degree of participation in design of NMY community.

Conclusion

From observation, we found out that it is possible to construct knowledge base in design for sustainable development for the community in some certain level. However the achievement of knowledge base is composed of 3 following aspects;

1. Awareness and respect in nature and culture of the participants.
2. Involvement of stakeholders who are in charge of policy setting, investment and management.
3. Collaboration and commitment of the community.

With this composition, the participants are expected to be self-dependence in the future by sustainability approach. The Ultimate goal of sustainable knowledge is to develop critical thinking ability of school community in order to tackle any problems in a future with or without assistance from expert.

However the interim evaluation of this phase cannot reflect the accomplishment of the whole project because of the last workshop (WS3: "Focus") has not been executed yet. Therefore, to assess the level of success in constructing sustainable knowledge, the post evaluation requires 2 evidences as achievement indicators which are;

1. Students and community are able to apply knowledge and experience from this project in other cases.
2. Students and community are able to pass over this knowledge to next generation.

The significant evidence in this project proves that the collaboration of different background of people is possible even in design. It would strengthen their sense of belonging and their pride of local wisdom. This would lead to sustainability society at the world.

References

1. Arnstein, S. R. (1969). A Ladder of Citizen Participation. *Journal of American Institute of Planners* Vol.35, No.4, 216-224.
2. Fusakul, S. M., & Siridej, P. (2010). DSEP: Implementation of Sufficiency Economy Philosophy In design. *Sustainability in Design: Now* (pp. 178-190). Bangalore: LeNS Conference, Bangalore, India.
3. Himmelman, T. (1996, January -). <http://www.commbuild.org/documents/himmcola.html>. Retrieved April 4, 2011, from <http://www.commbuild.org/index.html>: 4 February 2011
4. NESDB, S. E.-C. (2007). *Sufficiency Economy Implications and Applications*. Bangkok: Office of the National Economic and Social Development Board.
5. Pacharee Siroros. (2003) *คู่มือการมีส่วนร่วมของประชาชน* [Public participation Manual: EPA Review Vol. 5] Bangkok: Thammasat University Press.

6. Siridej, P., & Fusakul, S. M. (2010). BALANCE: the ultimate goal of Sufficiency Economy. *Sustainability in Design: Now!* (pp. 504-515). Bangalore, India: LeNS conference, Bangalore, India.
7. Yongtanit Pimonsatean. (2004) *โครงการรณรงค์เพื่อสร้างการมีส่วนร่วมของประชาชนในการวางและจัดทำผังเมืองรวม [Campaign to built People Participation in preparation of Bangkok Comprehensive plan]*. Bangkok: Department of Regional and Urban Planning, King Mongkut's Institution of Technology; , King Mongkut's University of Technology Ladkrabang.