Impacts of Exclusive Relationships between Decision Makers and Systems of Problem on a Development of Household Economy in Rural Area

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Diverse Systems of Problems in Participatory Rural Development

This article reflects upon a rural area development project in which contradictory solutions were generated by the local elders and a university team who were involved in a re-occurring problem of water shortage at Baan Sa-Ngin-Klang, Omkoi, Chiang Mai. Initially, these two examples were not intended to be participatory and by all means separate situations. But at one point, the Karen teacher had a chance to share the result of her study with the local elders. The result was dismissed, completely. Authors questioned this incident why did the elder rejects our solution despite its supporting data from a survey. Based on our experiences and long years of field works, cross-examination was carried out within the university team and with the teachers who participate in our rural development projects in the past four years. Interview, discussions, question - all these shed light on unintentional flaws in the way in which we make decisions to put forwards our participatory development projects.

In Omkoi Districts, Karens are living in more and more open economy to the outside world. Many villages in Omkoi have long been migrated from hunter-gatherer societies into agricultural society in which only some households are closed to trading with the outside. The production and consumption of goods become clearly separated in the same way as the mainstream. Due to low division of labor, provisions of basic necessities are not well managed. Annual preparation of provision of rice and chili are rooted in their culture. They are capable of reasoning planning and inventing as much as we do. Karens are one of main producers of low-price vegetables in the market, in turn; they consume other mainstream products too. Due to lack of infrastructure, Karen household economy still relies directly on availability natural resources such as firewood, water and sunlight. Economy changes, culture changes. Within mixed socioeconomic context, development projects for such areas must consider relationship between the decisions to develop and the system of decisions.

Relationship of Agents and Systems of Problem

There are considerable numbers of development projects carried out in rural areas in order to improve quality of their lives and to conserve the forest. Success of the projects depended largely on local collaborations, which require a platform for participations from all parties. We, hence, look

into a gap occurred from academic and local 'decision makers' made contradictory choices. We observed two separated events of decision-making in water shortage in a Karen village. The difference does not lie in actual solutions *per se*. The focus is on relationship of the decision-maker (or solution generators) and their decision system. This article argues if decision-makers exclude oneself from the problematic system that one want to find solutions for, the use of causal analysis alone generates incomplete solutions and miscommunications. Collaboration will be infertile.

Our experience suggested that discrepancy between their sociocultural system and that of the mainstream is not easy to bridge. Ellis, R., (2011:198) pointed out that the contradiction emerges when practices of participation that are mainstreamed by *sustainable development* paradigms are hijacked by *a civil sphere* that aims to exclude certain political forms." If we are looking at participation of a council of elders from a tribe to a university research-based development team, It is critical to identify from both sides: viewpoints, goals and objectives, immediate benefits (not necessarily money) and contexts of problems at hand.

Real benefits of the program must be perceived as valuable from the view of the local. For example, a university enabling program in rural Australia (Susan Johns, et.al., 2016). She described a key success that the local participants and the university team shared perception of value of the training program. Many local participants appreciated that their improvement had brought actual benefit in their lives. Successful cases were evident and that led to widely acceptance of the program. On the contrary, a development project attempted to achieve a social sustainable goal through NGO activity in urban India failed from the view of Ellis, R., (2011:205). He criticised the ways in which participation was enacted through consultation and litigation, as opposed to an appeal to territorial claims by the locals. The result was "*an NGO-dominated version of participation, which functions as much to exclude as it does to include*." The inclusive relationship of agent and the system is critical. For example, the local and specific system of land ownership; adult learners and results; the authoritative bodies and broader impacts on urban area. This kind of relationship between decision-makers and system of decisions should be clarified in participatory approach to development - especially with minority groups.

This article elaborates on exclusive relationship between decision maker and the system of decision that would has impacts on the development projects. It is not intended to explain psychological science of Karen's decision-making, rather to provide an observation of two different approaches - scientific versus habitual - to frame one's own systems of decisions.

The relationship of Decision maker and System of the Problem

The relationship has influences, more or less, on the process of making choice. When discussing about this kind of relationship, system is sometimes referred as decision-makers' environment, which is possible to be known by the decision makers, even though in practice, the decision-makers are within complicated system: social, political and economic forces. Decision makers represent a process taking place when they perform cognitive activities: analysis, generation and evaluation. A system of decision is the interplay of the process with the decision-maker's context, which affects

their choices and outcomes. For discussions of the incidences in this article, the system of decision[1] involves 1) *the goals or outcomes* sometimes cannot clearly defined, especially in sequential decision, because the choice situation is influenced by the past choices: 2) *the relevant alternative* referred to set of actions from which a choice will be made. It is also concerned with relation of choice and consequences: and 3) *choices* and probability of the choice situation which are certainty – uncertainty – and risk. Preferred choice is established on rules or a relation of causes and factors. These factors must be made clear when initiate participatory development in order to create mutual trust, hence, leading to an honest -fruitful collaborative development.

Sensitivity of System and Flexibility of Decision maker's Perspective

Reasoned and habitual decisions are equally essential in life because we cannot carry out reasoning in every single activity in our daily-life. In this article, two opposing approach appeared in other theoretical terms elsewhere. In an extensive review by Bernacer, J., et. al, (2014), Yu, P.L., and Chen, Y. Ch. (2010), , Chen, C., et.al., (2004), there are *Conscious decisions* and *Retrospective attributions to unconscious behavior*. Therefore, Scientific Approach to decision is conscious, deliberative,reasoned and scientific. It requires a high cognitive load, for complicated situation. Habitual Approach that composed of a) *Automaticity* (efficiency and lack of awareness[2]). Habitual approach is efficient because it is intentional - executed to reach a certain goal. In fact, in many daily decision scenarios, decision makers are equipped with a choice before evaluating any alternatives and their outcomes, based on their prior experiences (Betsch et al., 1998).[3] b) known conditions (*Perceived available time*, resource, knowledge) and c) *Constancy* - usually repeated pattern.

Both decision making approaches are governed by *Value* that can be learnt directly from experience. Dayan, P., (2008: 57-61) explains that *Native value* represents the actual utility or perceived value of an outcome in a motivational state. Naturally it should ground all methods of choice making. For example, shortcut save time, more water can come from new water-sources. *Cached Values* can be seen as alternative estimates of predicted utilities. Unlike the native this value show no direct commitment to its causes in terms of particular outcomes. It has *distinct computational benefits for choice* but has problem *coping efficiently with changes to the environment or motivational state.* Inflexibility of the habitual are the psychological hallmarks of automatic. It is called *habitual control.* For Scientific approach, if choices are based on approximate evaluations of predicted outcomes, decisions are made accordingly. This is the most straightforward control mechanism. If the evaluation system is sensitive to motivational state, then so will be the choice of action. (Sanfey et al. 2006: 60-61 Goal-directed Control) At this point, sensitivity and flexibility represent relationship between decision maker and the system of problem, of which choices are allocated to the core.

Contradictory Systems of Decisions on Solution to Water Shortage: A Case study

Baan Sa-Ngin-Klang is a Karen village of 35 households on mountainous area in Omkoi district, Chiangmai province, Thailand. There are 152 populations; 79 males and 73 females. On average,

[1] Formulation of these elements is based on criteria given by Shapiro, V. et.al. (2013) Measuring Dimensions of Coalition Functioning for Effective and Participatory Community Practice: 351

[2] C. Chen., et.al , 2004: e.g. stopping at the red traffic light and following the curve of the road etc.

[3] _____ , Activity rescheduling: reasoned or habitual? accepted 3 October 2004 doi:10.1016/j.trf.2004.10.003

there are 4 peoples per household. Karen way of living involves agricultural activity (rice and other economic crops). Karens are mixed in religious beliefs of animism which is culturally fundamental; Buddhism, and Christianity. It locates 29 kilometers from Omkoi district center. Normal travelling time is 1 hour on dirt road or longer due to the road conditions and weather. It is one of a few villages that have access to mainline electricity. Now, every house has water storage because affordable large plastic buckets are available in Omkoi city.

Water fetching was a mundane for the young. As our Karen teacher explained her experience;

> "*When I was young, it was my daily chore, sometimes my brother, to gather water from the creek. It was very far, at the time. My brother and I had to make many trips until everybody done their business with water. That was a tough for such a small girl. It was OK for everyone else because they did not have to do it. May be, apparent lack of water storage is for small girls only. Now, I'm a mother. We got water from pipe and store it for daily use. It's much better for my kids and everyone.*"

The experience told her that bigger water-tank would relieve this tedious chore. It could also be bad experience that encourage change. In the past decades, many villages built communal storage not only for household activity but also for sanitary care and livestocks. Water sources on the mountain are abundant however not to all. Watershed areas are thus vitally important to Kaen people. It is rooted in their culture. It is culturally wrong to cut trees or to excrete in certain areas that will interrupt water supply. Past experience cannot stop actions of stupidity and ignorance. There was an incident which a man cut down many trees in on the top-hill. Disregarding warning from the elders and neighbours, the result was a loss of that water source.

To the locals, water shortage has been a problem in this village for more than l0 years, especially in dry season. Chen, C., et. al (2004: 357) stated "…*Over time, mode choice behavior exhibits one of the most important features of habit: repeated performance…a positive relationship between past behavior and present behavior is implied, but not necessarily that past consumption will stimulate greater consumption in the present*…" Vice versa, on-going problem did not seem to improve management of water in the village. Amount of water set limits to all 3 purposes, mainly drinking water, sanitation and household economy (livestock and plants). Nutrition, expansion of farm and experiment with ideas are stagnant because water was not allowed. A teacher, who is a Karen and our team member, brought the problem into our attention and stated that this was the local's interest. The local needs and area based problem provide initiatives to all of our projects derived. First, we asked a basic question to examine the supply and demand of water in the village and to clarify the definition of "not having enough water for household activity"

A university team, in collaboration with the teacher, employed 'scientific problem-solving approach.' We set out what we do best - study the problem. The teacher designed learning process for her students to search for 'real cause of water shortage'. They asked simple questions volume of the water used and that of the water supply. The context of the teacher is that she taught in a Community Learning Center[4] in (cottage school) in this village. This school is under Office of the Non-Formal and Informal Education (NFE) whose purpose is to provide functional litercy, skills for

[4] Cf. The Hill Areas Education Model: The Ashram Approach to Community Education Development, Department of Public Welfare, 1986 : Original fromthe University of Wisconsin - Madison

occupations and knowledge for better quality of life and conservation of the environment. The cottage school is critical mostly to children to expose to literature at young age. The cottage's curriculum can be independently designd to fit specific context of area. The teacher has been in our training program for research-based and problem-based integration for learning & teaching by the university team for 4 years.

The village got water supply via pipeline linked from water source on the mountain. The school team found that water flowed consistently but at small volume. Systematic survey and mapping was arranged for students to grasp overall picture of water consumption. To studies household management of water and amount of the supply, the students investigated, water sources, Pipes line, capacity of water storages. They also measured water inlet flow-rates from pipelines. They measured ratio of the water volume during a period of time at different time of day. The final result is an average of 10 surveys. In case of amount of water in the stream, they calculated flow-rates simply by use stream *cross-sectional areas* multiplied by *speeds* of stream. Measurement of water flow-rates from 3 points of inlet-pipes, 10 times each to average, 1nd-point is 7.90 liters/minute, 2nd -point is 4.40 liters/minute, and 3rd-point is 9.77 liters/minute. Sum of them are 22.07 liters/minute, calculated to 31.8 cubic-meters/day. In term of at stream that located near and lower altitude than village, is 30.93 liters/minute, calculated to 44.5 cubic-meters/day. In brief, the amount of daily supply was 8 times larger than that of the demand.

To investigate the water demand, the students carried out survey, interview almost every household. They collected two sets of data during a year. First, the demand in rainy season was 110.24/liters/ household/day. The second - in dry season - was 115.93 /liters/ household/day. The average was 113.08 liters. Note that use of water is quite consistent throughout the year. Demand of water is distributed mainly into personal hygiene and household sanitation (cooking including washing cloth, dishes). The total village demand sizes is 3.95 cubic-meters/day. If considered by person, it is 26.03 liters/person/day. Average consumption rate was lower than that of Thailand rural area that is 100 liters/person/day.[5] Karens at Baan Sa-Ngin-Klang was in a hygienic habit and consumed water quite efficiently. Analysis of the water supply and demand pointed out that the daily volume of supply was greater than daily used for 8 times. day, 27.85 cubic-meters of water was overflowed and yet not including water in the stream.

Based on the result, it urged us to re-think about the problem of water shortage in this village. The school team reflected upon water usage and a behaviour pattern emerged. It was evident that every household consume 3.95 cubic-meters/day in the same period; in the morning before went to work and in the evening after came back to village. During the morning and evening, the flow-rate was 1.32 cubic-meters per hour - 3 time lower than actual demand. Therefore, this village experienced interval water-shortage during peak consumption time. They merely did not store enough water to use in their household. For the rest of the day, water overflowed after filled in all the storages. The school team concluded the cause of the shortage was concentrated consumption

[5] *Department of Water Resources, Ministry of Natural Resources and Environment, (2003) http://gis.chiangmai.go.th/index.php?name=infobase&themeID=4&pid=29&District_ID=23*

pattern and water storage management. The solution thus involved adaption of consumption behavior, management of water distribution and storage on household and village scales.

Alternatives Viewpoint of Decision makers

On April 3rd 2014, with 35 representatives of each households attended the village committees meeting, as well as the teacher. The water-shortage was on agenda. The teacher took the opportunity to present their study to the meeting, explain the situation and put forward Water management as a solution that is considered sustainable and economic. For example, to provide larger storage; smart management of water supply system; authorize water managing committees. The local elders rejected this solution with many given reasons. One of which was difficulty in adapting the village's ways of living. The village elders proposed a solution that involves expansion of water sources. The elders also suggested that financial supports from local authoritative body or NGO would facilitate them to expand the pipeline to another water source. The support was also viable, especially from the local authority. Majority of the meeting inclined to agree with this idea.

Later on, the new pipeline was completed. More water was brought into the village. The supply increased for all, yet the shortage reoccurred, particularly, during the common time for chores. On our discussions, the teacher said that the villagers still complained about "not having enough water for household activity." In addition, over supply of water caused overflow around the village. It was inconvenient to the villagers and could lead to infections in animals and children, if no caution.

Contradictory Preference and Common fallacy of Habitual Approach

End results proved the school team was right in suggesting the water management proposal over the expansion of water sources. At Present under the tribal ideology and semi-closed economy of this village, the contexts of public projects, such as water pipeline, are far more complicated. Benefit is a key influence when the value of choices was perceived. Although most of decision-makers undergo their decision rationally, Belief had an impact on the decisions this happen on a level of ordinary people to "*secretary-of-state level*." (Pearce, 1989) The politicians need to be informed about the impact of built environment on well-being of the population. Yu and Chen (2010:209) methodology seems to be a comparison of ideal against perception of value of decision makers. As well as reality against perception. From this aspect, the decision to expand water resources was also influenced by some other reasons apart from environmental sustainability. Relationship of decision maker (agents) and the problem (system) is a reminder of the gap that need best effort to be bridged.

In the term ''participation'', Cosimo. T., and Mannarini., T., (2014) points to two semantic aspects: *participating as ''taking part'' and participating as ''being part''*. Therefore, participation entails (community) involvement and (social) identity. In water shortage solution, the locals take part to improve their lives. This kind of project endorses every members of the society to participating as 'being part'. It is their community in which everybody knows everybody else. Each individual identity is bonded socially - leaders or followers. In this system, local participation is innate but academic team participation is naturally alienated. Vice versa, this would happen in research-based development project. Solutions of the local did not include their behaviour as a cause of the water shortage. They seemed to own the water system (natural resource) and have authority to alter and exploit. They were taking part of to solve the problem and disregard themselves as being part of the

problem. Although the project aims for benefit of the local, The local participation sometimes appears as taking part but more often merely a helping hand who could hardly express their true opinions and needs. Everyone had right to influence political issue in some ways or another. Academic team has to position themselves wisely soas to adapt goal, methods, to serve the targeted community and not appear too naive, over simplistic, and to some extent, irrelevant.

Remote rural Community and mainstream society operate under different system. To identify the Relationship with the system, it requires scientific approach. All data and factors must be present. This article presents two parties ; local elders and academic team who approach the community work from habitual decision making approach. Two parties who seemed to employ habitual approach are the local elder and the university project leaders. The former made decision based on past experience and partial information. It is normal where *problem solvers skipped directly from problem recognition to hypothesis generation to solution planning, all without systematic data collection to support their efforts*. (Marcie J. et. al 1995: 13) The latter made decision based on confident in dominating view. Example, when a proposal for rural development is rejected, we usually claimed that our proposal is reasonable and scientifically sound but the villagers merely could not understand. Automatically employing one's own approach across culture could blind the decision maker and fall into habitual approach. (Chen, C., et.al., 2004: 353-354)

Automatic and Relevant alternatives

The locals repeatedly experienced water shortage problem because convenient timing compare to storing water during daytime. This habitual behavior can also be controlled by conscious planning if needed. A good practice would be to set a " Knowledge-building process" to share with the locals. (Falconi, S. M., & Palmer, R. N., 2017 :33) This step proved to be an extremely challenge. It takes up time, resources and human resources. Rural development project have to pre-plan introductory phase that may yield another kind of result before initiate main project.

Alignment of Perceived available resources and and Goals

Approach towards rural development in Thailand and elsewhere seemed different geographically, economically and socio-politically. Local support is pivotal to the judgement of the development in karen village. There are emerging of various organisations working in the area. Alignment of needs and goal must be done within the perceived available resources, from the local views. In case of the water shortage problem, it is unclear whether all the actual needs have been aligned by the decision makers. The survey of water supply and demand may not include all the need that is agricultural activities that is operated under the financial pressure of the open market. In such changing environment, scientific approach seem hesitate to alter their goals to fit the dynamic system.

Consistency of Choice and Probability

Probability of choices affected decision on water shortage problem. Discussions on cause and effect of the problem can be done. Change of behaviour could also evolve. But academic team did not explain possibility of obtaining water storage, cost, transportation. Thus, the solutions would seem impossible. A dominant leader's decision could be approved by the all attendants in the meeting as collective decisions because kinship networks may be at play. Hiwatari, M., (2016:14-15) suggested that we should look into relationship of the network as "risk-sharing networks" to mitigate income fluctuations and daily difficulties. Not all have access to the market. Probability of choices is under the condition of semi-closed household economy.

Conclusions

Relationship of decision maker who representing process of decision and the system of decision which representing 1) *the goals or outcomes* 2) *the relevant alternative* 3) *choices* and probability of the choice situation which are certainty – uncertainty – and risk. The relationship may be evaluated from two aspects: a) sensitivity of the system dimensions. In practice, the system is formed by decision makers. It become concrete once comes to existence. In terms of sensitivity, decision makers should constantly re-evaluate the system in order to maintain its sensitivity to constantly changing elements (such as motivation and need). In this case, the locals disregard themselves as being part of the system while the scientific decision maker did not taking part. These led to misunderstanding of one another's good intentions; miscommunication and non-inclusive approach toward rural development. b) Flexibility of the decision maker's perspective in order to operate across different systems of decision simultaneously. It require high level of self awareness. To work in a world in which automation expand exponentially, flexibility in perception is invaluable. Decision maker in such situation must not be automatic - being habitual in the name of science may not always right.

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