

## **The Potential Development for Traffic Accident Prevention of Stakeholder in Communities Beside Highway in the Northeast of Thailand**

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**Abstract:** Over 3,000 die each day and >10 millions are injured. Participatory action research base on 3 phases; such as situation analysis, potential development and implementation in Itui sub-district, Yangtalad district, Kalasin province, 50 samples of stake holders and 247 students. Data were collected by questionnaire and future search conference including Hiyari hatto. Content analysis and descriptive statistics in addition to paired t-test for statistically different. The results showed the situation in the past; the cause of accident from overload truck, drunk and sleepy driving, no signal, racing, no traffic light, no training, no helmet using, non-standard road, high speed, animals, without training, no identification drive while in the present situation; same problem but increasing concern from stakeholders in phase 1. Hiyari hatto result found that fifteen risk spots. Expectation in the future need training; strong law implementation, no drunk drive, limit speed, increasing concern, car checking, volunteer, improving and extent road, safety guideline, budget, helmet and belt using, rescue volunteer. In phase 2, the potential development for raising traffic accident prevention by identification driving license training, traffic volunteer training for student in four school. Training both for stakeholders and students; handbook distribution, discussion, planning, public relation, meeting and sharing for increasing concern. In phase 3, all stakeholders implement for traffic accident prevention in communities beside highway both in school and community traffic accident prevention training such as cutout public relation at risk area, local broad casting, study competition for traffic accident prevention for raising awareness, campaign warning cutout in the risk area the appropriate of Hiyari hatto result including village competition for traffic accident prevention. Traffic accident prevention score on knowledge, belief, attitude, intention and practice after implementation higher than before significantly both in stake holders and students. The number of death and injured from traffic accident were decreasing.

**Key words:** Potential development, traffic accident prevention, highway, phases, Hiyari hatto, Thailand

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### **INTRODUCTION**

Road safety is no accident. Over a million people are killed each year on the world's roadways: >3,000 die each day and >10 millions more are injured. Road traffic related crashes impose an enormous public health burden global. In 2000, road traffic injuries were the 9th leading cause of disability-adjusted-life years lost worldwide and are projected to become 3rd by 2020. The World Health Organization (WHO) is taking a bold step forward by addressing road traffic injuries as a preventable global health problem (Peden *et al.*, 2002). The comparison of

traffic accident among ASEAN country found that Malaysia is highest number of death 25.0 per 100,000 population and Thailand is 2nd 22.9 per 100,000 population, the trend of number of accident fatalities per 100,000 population and per 10,000 vehicle during 1997-2007 are stable until right now no decreasing (Fukuda, 2006; Taneerananon, 2006). Although, Thai government alert to alleviation this serious problem. Traffic accidents are one of the leading causes of death in Thailand. According to an ADB-ASEAN, report released in March 2004, the average economic cost of one traffic accident death is about 2.85 million baht. In addition,

there is also the inestimable psychological damage (Thai health promotion foundation). Therefore, traffic accidents impact human physical and mental, social including prosperity and quality of life.

The 1st National socio-economic development plan of Thailand was established in 1961. This caused Thailand to develop rapidly in all aspects such as transportation, industry, agriculture, etc. The government, however had no national accident prevention plan, so more development produced more traffic accidents and thus patients. Therefore, we could say that the traffic accident is a disease that is caused by an increase in development from 1969 up to now. Traffic accidents are a major cause of death and the trend increases rapidly every year. Most deaths occur in youths with about 20,000 cases year<sup>-1</sup>. (Booryahotara, 1993).

Traffic accidents are a serious problem in Thailand in every province. This leads to public health, economic and social problems. In the years, 2003 and 2004, there were 65,932 and 86,528 accidents with 46,035 and 80,305 injuries as well as 11,252 and 13,836 deaths. Traffic accidents have been the 3rd cause of death since, 1969 until now and increased to 13,996 die and injured 973,104 in 2006 (Ministry of Public Health, 2007), the trend of traffic accidents is increasing rapidly. Although, the Thai governor alert to implemented to tackle traffic problem.

Accident deaths are rapidly increasing. Thai deaths in the year, 2000 were 13,194 cases or 21.4 per 100,000. Injury and treatment in all government hospitals is 921,352 cases, 90% of injury patients, major cause of death <50 years old and mostly males. For both, injury patients and deaths >80% are drivers or passengers and most were motorcycles. The most severe and most causes of death were from head and face (Santikarn, 2002).

Accidents in developing countries are higher by 10-40 times than in developed countries. This is because developed countries can control and prevent the increasing rate of traffic accident deaths. Developing countries however, do not control this problem seriously so, people die prematurely (Booryahotara, 1993). Injury surveillance and traffic research has found that accidents are the main cause of death with males more than females at a ratio of 3.2:1, ages from 15-29 years in the labor group and having risk behaviors of not using helmets when riding and being drunk while driving (Epidemiology Division, 2000).

Future search conference as a vehicle for educational change is a shared vision, action, the planning process, the conference design components (the past, the present, the future and planning), successful outcomes and lessons learned. Bailey and Dupre (1992) made the people concern their situation problem and challenge to

development. Hiyarii hatto (Fukuda *et al.*, 2007) is a Japanese verbal of expression exclaimed when sudden unexpected incident is happened but not yet crashed as individual had perceived, the risk and responded promptly to their self consciousness and witnessed the situation and then reacted to stop before the accident occurred so, call potential accident or in other word similar to near miss Hiyari hatto concept is a psychological technique which is widely used in Japan for conducting safety issue in hospital, factory and company and recently use in traffic safety data collection like black spot identification by IATSS scholars in Japan.

Therefore, Hiyari hatto is the technique for help people concern their live in risk area and have to change the risk to be safely situation. Researchers are concerned about this serious problem, so would like to study the potential development of traffic accident prevention among stakeholders in communities beside highway by applying Future search conference and Hiyari hatto to strengthen development both in schools and communities as well as for traffic accident control and reducing the traffic accident rate, mortality and disability in addition to for good quality of life of the people and good society further.

## **MATERIALS AND METHODS**

The research aims to study the potential development for traffic accident prevention of stakeholder in communities beside highway in the Northeast of Thailand. This research designed by participatory action research, the researcher will use complex methodology both of quantitative and qualitative study. The research is separated in three phases, consists of phase 1 for situation analysis and phase 2 was develop the potential of stakeholder for traffic accident prevention and the 3rd phase was traffic accident implementation and evaluation.

**Phase 1:** Situation analysis and need assessment for traffic accident prevention among stakeholders by using Future search conference. This phase, the researcher study the situation analysis of traffic accident prevention both in stakeholder and primary school students in communities.

The study designed in this phase was descriptive study design. This phase will study both quantitative method by questionnaire and qualitative method by future search conference and Hiyari hatto. The population in this study was head village, sub-district administration organization member, teachers, health personnel and health volunteer including primary school students. Setting study area is Itui sub-district, Yangtalad district,

Kalasin province, Thailand. The study samples were consisting of 50 stakeholders from community and 247 primary school students.

**Instruments:** The variables of this study will collect by structural questionnaires which answer the aims of the study by literatures reviews. The questionnaires consist of five sections such as personal data, traffic accident prevention knowledge, attitude toward traffic accidents prevention, intention for traffic accident prevention and practice on traffic accident prevention.

**Standardize properties of questionnaires:** Content validity; the content validity will check by sending questionnaires to unless than three road traffic accident experts to consideration in content validity, suggestion and recommendation after that the researcher will improve as followed suggestions for correctly and completely.

**Data collection method:** Coordinating with head of sub-district administration organization, chief of rural police station, teacher, chief of head villagers, monks and chief of health station and then interviews and qualitative data collection by using Future search conference and Hiyari hatto technique.

**Quantitative data:** The data will be recorded into the computer base on double data entry procedure by researcher's assistants using program STATA. The analyses will be taken place in order, starting from descriptive statistic for percentage, standard deviation and arithmetic mean and different significant by Paired t-test.

**Tools for qualitative methods:** In-depth interview target samples about traffic accident situation with head of sub-district administration, head of health station, head of policeman and teachers and Future search conference including Hiyari hatto as well as used observation method for general context in communities and schools also.

**Data analysis:** Qualitative data from target groups collected will be using content analysis.

**Stakeholders in this study:** Stakeholders in target area will corporate to causality identification of traffic accident prevention such as Health care workers in community health center. The teachers from four primary schools, policeman, sub-district administration organization.

**Phase 2:** The potential development among stakeholders was conducted for traffic accident prevention. The

potential development program for raising traffic accident prevention program depends on problem study and need assessment in phase 1 such as implementation was depended on problems solving that finding for vision or action plan from Future Search Conference (FSC) of all stakeholders and Hiyari hatto. Training, media conduct, public relation, participatory approach for activities in traffic accident prevention.

Coordination with expert and invitation for lecture and practice for traffic accident, prevention emphasize human factor especially driver, pedestrian and passenger both car and motorcycle which involving their car and road using as well as their environment for traffic accident. After stakeholders are attended the program for potential development by Future search conference and Hiyari hatto program for traffic accident prevention then they must implementation for traffic accident prevention in their communities further to meet their problem and context.

**Phase 3:** All stakeholders implement for traffic accident prevention in communities beside highway both in schools and communities, especially in curriculum and obtain fiscal year plan of sub-district administration organization:

- Identification driving license training
- Traffic accident prevention training
- Cutout public relation
- Traffic accident prevention hand book distribution
- Traffic volunteer training for student in four schools
- Article competition for traffic accident prevention among students
- Campaign in the important festival both new year and Songkran festival
- Warning cutout in the fifteen risk areas, the appropriate of Hiyari hatto result
- Village competition for traffic accident prevention

## RESULTS

The results of this research divided into two groups; both stakeholders and students.

**Stakeholders:** Demography characteristic of stakeholders, the total sample size consists of 50 stakeholders. Most of them had age group of 41-55 and 46-50 years (28%) male, occupation were government employee and agriculture 52 and 36%; position were member-district administration organization, vice head villages, health volunteer 74%, income per month >20,000 baht, married 88% education were bachelor degree

and high school 34 and 28%. After implementation, the mean score of knowledge, belief, attitude, intention and practice of traffic accident of stakeholders were significantly increasing than before ( $p < 0.001$ ).

**Students:** The demography of students, the total sample size consists of 247 students. Most of the subjects were 12 years old 25.91%, education grade 9 number 25.91% and male 127%. After implementation, the mean score of knowledge, belief, attitude, intention and practice of traffic accident of students were significantly increasing than before ( $p < 0.001$ ).

The results of future search conference could divided to three situation namely situation of traffic accident in the past 5 years, situation in the present and future expectation for traffic accident prevention as follow:

**The situation of traffic accident in the past 5 years:** Crash between motorbike and car, drunk drive, crash cow, truck, road, ride racing among youth, no traffic light, no helmet using, non-standard road, narrow, lack of traffic rule knowledge, car crash with farm car, crash at curve road, high speed in community, unsmooth road, car without signal light, farming car, many kind of animal; cow, chicken, duck on the road, without training from parents, not clear and not enough of public relation cutout, unhealthy physical; drunk, sleepy, racing motorcyclist, sugar cane truck, narrow road, no Traffic sign, no lighting enough on the road, high rate of traffic accident; motorcycle and car.

**The situation of traffic accident in the present:** Racing drive, lack of traffic rule knowledge, drunk drive, high speed in community, no Identification drive, not standard road, racing motorcyclist, sugar cane truck, no traffic sign, no lighting enough on the road traffic accident, animal on the road cause of accident, bad environment, curve road, no helmet, M 100 drunk, not enough of traffic accident prevention cutout, policeman teach traffic rule, many organization concern increasing.

**Future expectation for traffic accident prevention:** Strong law implementation, traffic light, kindly driving, no drunk no drive, limit speed driving, increasing concern from policeman, training on traffic rule for the people, do not let the children driving on road, car checking, Improving road, traffic accident prevention education both in school and community, expand road lane for animal and pedestrian, traffic light on the intersection road, increasing knowledge for traffic accident prevention in many group; parent, standard setting for road safety guideline in community by stakeholders, sacrifice from stakeholders, budget support from government,

stakeholders all in community, limitation of speed driving, need policeman to educate in community, extend road for pathway, improve the road, u-turn, lane in community, vinyl for public relation; black spot, student motorbike training, motivation for helmet, safety belt, standard road, public relation, encourage community for traffic accident prevention, light on road, leadership for traffic accident prevention, traffic accident prevention campaign, participation all stakeholders, guideline for traffic accident prevention setting, check up point (alcohol, vehicle, drive ID), driving license training, traffic signs and handbook distribution.

**Hiyari hatto technique:** The result of Hiyarii hatto shown that there were fifteen risk point in there communities which same results from car, motorcycle and pedestrian analysis. These lead stakeholders increasing concern for traffic accident prevention by conducted cutout public relation for traffic accident prevention in the communities for warning the people carefully traffic in their communities.

**Villages candidate for traffic accident prevention:** The candidate arrange for all villages in Itui sub-district focus on: no death case; no traffic accident; committee for traffic accident in community was setting; currently active activities for traffic accident prevention in communities; traffic accident prevention on traffic accident prevention was distribute to villagers by using local broadcasting or handbook. These process conducted by staff in communities. Finally, three villages won and got rewards from researchers.

**Article candidate on traffic accident prevention:** After implementation about knowledge on traffic accident prevention on four schools in Itui-sub-district administration, especially training for traffic accident prevention volunteer in school including handbook for traffic accident prevention distribution. The study candidate on traffic accident prevention was arrange for students for increasing leadership and awareness concern about traffic accident and safety life. The 48 articles from four schools were sent for candidate and give them good opportunities for receiving rewards from president of ATRANS.

## DISCUSSION

**Stakeholders:** After implementation, the mean score of knowledge, belief, attitude, intention and practice of traffic accident of stakeholders were significantly increasing than before ( $p < 0.001$ ). Because of many activities for traffic accident prevention such as training, meeting,

discussion, license training and campaign about traffic accident prevention make stakeholders gain knowledge, attitude, belief, intention and practice for safety. The same as Sota studied. The potential development of community beside highway location for traffic accident prevention and problem solving found that after traffic accident prevention program implement made traffic safety behavior score higher than before implement significantly.

Therefore, it necessary to information, education and communication by participation with all stakeholders including using Hiyari hatto and Future search conference made them know their problem, their need and how to meet their requirement for traffic accident prevention as the study in Japan by Fukuda *et al.* (2007) found that Hiyari hatto is the technique for help people concern their live in risk area and have to change the risk to be safely situation and relevance that Future search conference made the people concern their situation problem and challenge to development (Bailey and Dupre, 1992).

**Students:** After implementation, the mean score of knowledge, belief, attitude. Intention and practice of traffic accident of students were significantly increasing than before ( $p < 0.001$ ). The correlation analysis show that intention correlation with practice while attitude and belief correlation with intention. Therefore in the case of traffic accident prevention behavior modification have to increasing concern to attitude and belief especially intention firstly.

Because of many activities for traffic accident prevention such as training, meeting, discussion, study competition, volunteer training for road safety about traffic accident prevention make students gain knowledge, attitude, belief, intention and lead to gain practice for safety behavior follow the normative theory said that attitude and belief effect to intention and intention correlation with practice.

**Future search conference:** The results of Future search conference could divided to three situations namely situation of traffic accident in the past 5 years in the present and in the future expectation for traffic accident prevention. Because future search conference made the people express their idea and experience including the future their need to share and change each other among stakeholders and lead to plan and implement for traffic accident prevention both in human, environment and regulation in their community.

**Hiyari hatto:** The result of Hiyariii hatto shown same result from car, motorcycle and pedestrian analysis. The result of risk sport in communities fifteen points. This lead

stakeholders increasing concern for traffic accident prevention by conducted cutout public relation for traffic accident prevention in the communities for warning the people carefully traffic in their communities. Because Hiyari hatto made the people found risk sport in their community made them concern about their risk and have to alleviation their problem that appropriate their potential and their context, especially sub-district administration organization is available plan and budget for next year and make development sustainable are increasing in community and finally made quality of life of the people in community further.

**Villages candidate for traffic accident prevention:** The candidate arrange for all villages in Itui sub-district focus on: no death case; no traffic accident; committee for traffic accident in community was setting; currently active activities for traffic accident prevention in communities; traffic accident prevention on traffic accident prevention was distributed to villagers by using local broadcasting or handbook. These made the people try to improve their village to be change for good quality of lie in the traffic accident prevention and got reward especially proud in their community to be road safety.

**Article candidate on traffic accident prevention:** After implementation about information about knowledge on traffic accident prevention on four schools in Itui sub-district administration, especially training for traffic accident prevention volunteer in school including handbook for traffic accident prevention distribution. The study candidate on traffic accident prevention was arrange for students for increasing leadership and awareness concern about traffic accident and safety life. The 48 articles from four schools were sent for candidate and give them good opportunities for receiving rewards from president of ATRANS.

These made students increasing concern about their behavior, especially knowledge, attitude, belief, intention and practice for traffic accident prevention and more over made them strong good behavior in road safety further. This participation action research aimed to study the potential development for traffic accident prevention of stakeholder in communities beside highway in the Northeast of Thailand.

This study was study at Itui sub-district administration organization, Yangtalad district, Kalasin province, Thailand. Two kinds of sample, firstly was 50 stakeholder from communities such as head of village, health personnel, policeman; member-district administration organization, vice head villages, health volunteer, monks, EMS staff, accident prevention in

communities. And the other group of sample was 247 students from four schools namely Donkeevithaya school, Yangkumvithaya school, Bankaevothaya and non-gwangbokaew school. The implement of this research using Future search conference and Hiyarii hatto for problem analysis of traffic accident in communities, planning together and implementation on various activities such as campaign, cutout public relation, local radio broadcasting, training for driving license, handbook of traffic accident prevention distribution article candidate among student, village traffic accident prevention candidate all activities focus on participation and then evaluation both qualitative and quantitative data.

The quantitative data was used STATA program for analysis and qualitative data using content analysis. The statistically, significantly comparison of mean score of traffic accident prevention knowledge, belief, attitude, intention and practice on traffic accident prevention between before and after implementation by Paired t-test was applied. The results revealed that statistically significant differences ( $p < 0.001$ ) both in stakeholders group and students group. When study about correlation found that in the student group knowledge is no significantly correlation but belief and attitude is significantly correlation to intention and intention is directly correlation to practice.

In the stakeholders and community, no significantly correlation among variable. Future search conference was used for analysis situation for in the past, present and the future for traffic accident prevention and using Hiyari hatto for participation analysis risk point in community in the term of car, motorcycle and pedestrian traffic accident. The result of risk sport in communities was fifteen points and lead to conduct warning cut out in these area. Beside these, there were the traffic accident prevention villages candidate as well as articles candidate in traffic accident prevention by students also.

The number of death and injured was decreasing. This study recommends that behavioral intervention to increasing traffic accident prevention should incorporate with Future search conference and Hiyari hatto including implementation suitable stakeholders needs and participatory action.

## CONCLUSION

Traffic accident prevention model 3 phases; 1st situation analysis, 2nd potential development and 3rd implementation by participatory action, all steps with application Hiyari hatto and Future search conference lead to successful for traffic accident prevention behaviors and decreasing number of death and injuries.

## RECOMMENDATIONS

It should publish relation to another community for traffic accident prevention:

- Hiyari hatto should be applied for find out the risk sport and approving the physical environment in community
- Future search conference is needed for make the people know their village about situation of traffic accident problem and traffic accident prevention in the past present including future
- The important modification for traffic accident prevention is intention increasing, attitude and belief for traffic accident prevention
- Participation from all stakeholders make the development of traffic accident prevention is sustainable
- It should study participation of all stakeholders in district level and provincial including nation level
- It should continuous study for sustainable in the same area
- It should be resource allocation both upper and lower dimension in communities participation together
- Future search conference and Hiyari hatto need are application together for traffic accident prevention in other target
- It should application social norm theory for application in other target for good behavior modification

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