HEALTH IMPACT ASSESSMENT TRAINING MANUAL

"A Learning Tool for Healthy Communities and Society in Thailand, Southeast Asia and Beyond"



By

Decharut Sukkumnoed, Pattapong Kessomboon Nusaraporn Kessomboon, Suphakit Nuntavorakarn And Nuntana Sabrum









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Research and Development Program on Healthy Public Policy and Health Impact Assessment (HPP-HIA Program), Health Systems Research Institute

and

Healthy Public Policy Foundation (HPPF)

THAILAND



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Preface

Since 2001 Thailand has embarked on multiple processes to develop health impact assessment (HIA), especially as a tool for supporting a collective learning process in society. To build up essential capacities on HIA, the development of knowledge base through researches, case studies, and teaching and learning in education institutes have been conducted together with various seminars, open forums, and international workshops. The efforts have been put to involve as many societal sectors and levels as possible in order to create a participatory and sustainable approach to healthy public policy development.

However, a common viewpoint shared by the participants of local, regional, and international events, in particular the Third HIA International Workshop and the HIA Interactive Training Course organized in Thailand in July and October 2006 respectively, is that some health impacts have transcended national territories, bringing the need for cross-border collaboration on health impact assessment and healthy public policy.

As the HIA knowledge and skills of the countries are different, international capacity building is hoped to bridge these gaps. Accordingly, this training manual is one attempt to share the knowledge and experiences of HIA development in Thailand with international audiences, particularly those in developing countries.

The inputs were in large part derived from the lessons, experiences, opinions, and suggestions shared in the "HIA Interactive Training Course: A Learning Tool for Healthy Community and Society", which was held in Khon Kaen, Thailand during 15 – 19 October 2006. It was attended by local health experts and practitioners as well as regional participants from other Southeast Asian countries and Australia.

The contributions from the participants were truly fruitful. The authors also would like to extend special thanks to Patrick Harris and Ben Harris-Roxas from the Centre for Health Equity Training, Research and Evaluation (CHETRE), University of New South Wales, Australia for their editorial assistance and useful comments.

Last but not least, the Thai-health Global Linkage Initiative Program (T-GLIP), Thai Health Promotion Foundation should receive the warmest gratitude for its funding support to the production and publication of this book. It is hoped that this Health Impact Assessment Training Manual will contribute more or less to further HIA development in Thailand, Southeast Asia, and beyond.

Decharut Sukkumnoed

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List of Acronyms and Abbreviations

ASEAN

Association of Southeast Asian Nations

BAAC

Bank for Agriculture and Agricultural Cooperatives

B.E.

Buddhist Era

CBA

Cost-Benefit Analysis

DALYs

Disability - Adjusted Life Years

EGAT

Electricity Generating Authority of Thailand

EIA

Environmental Impact Assessment

EHIA

Environmental Health Impact Assessment

EFHIA

Equity-Focused Health Impact Assessment

EU

The European Union

GIS

Geographic Information System

HIA

Health Impact Assessment

HPP

Healthy Public Policy

HPP-HIA Program

Research and Development Program on Healthy Public Policy and

Health Impact Assessment

HPPF

Healthy Public Policy Foundation

HSRI

Health Systems Research Institute

IAIA

International Association for Impact Assessment

NGO

Non Governmental Organization

NMVOC

Non Methane Volatile Organic Compounds

PDP

Power Development Plan

RCT

Randomized Controlled Trail

TSP

Total Suspended Particles

UK

United Kingdom

VROM

Dutch Ministry of Housing, Spatial Planning, and Environment

WHO

World Health Organization

PART I Introduction to HIA

PART I Introduction to HIA

The purpose of this part is to provide readers with an introduction to the manual including an overview understanding and key principles when conducting Health Impact Assessment (HIA). The training approach in this manual is not explained the step-by-step in HIA process, but rather emphasis on the key concepts and obstacles in applying HIA in order to achieve healthy public policy.

This part covers the following issues:

- ☐ Introduction to the manual
- Healthy public policy
- HIA and health promotion
- HIA development in the recent years
- HIA methodological development
- Underpinning principles of HIA
- HIA and policy-making
- Future platforms of HIA development
- Practical difficulties and this training approach

1.1 Introduction to the manual

1.1.1 For what purpose?

The purpose of this training manual is to develop essential HIA research skills and capacity in 4 main areas as the following:

- Exploring and nurturing the institutional grounds for HIA development in different policy and political contexts within the region;
- Understanding and analyzing potential health impacts by using varieties of HIA tools, both quantitative and qualitative analysis, in different levels of HIA analysis;
- Developing sound policy alternatives and sensible policy actions to promote healthy public policy in different policy and political contexts;
- * Following-up and networking within and between countries in order to continue and improve HIA collaboration within the region.

1.1.2 Learning Approaches

This training course will mainly apply a problem-based learning approach by focusing on common policy challenges facing HIA in the agricultural, energy and transportation sectors. In detail, five teaching methods will be used in this training course.

- 1. Lectures on HIA principles and guidelines.
- 2. Experience Sharing of HIA practices and lessons learnt from various countries.
- 3. **Group Work on Case Studies** of three common challenging cases in the agricultural, energy and transportation sectors. The cases include HIA for plantations, HIA for provincial energy planning, and HIA for transportation development.
- 4. **Study Visits**, to see and learn about inspiring experiences related to HIA and healthy public policy movements at a local level
- 5. **Learning by doing** by collaborating on HIA case studies and continuously building an HIA network in the region and with other regions

1.1.3 Who is the manual for?

This manual is intended for those who are concerned of health impacts consequences from any policy, program or project development and implementation, and be interested in applying HIA process to promote healthy public policy. These include HIA practitioners, policy entrepreneurs, academics, NGOs, government authorities as well as active citizens.

Introduction to HIA

1.2 Healthy Public Policy

At this time in the early 21st Century the health, wellbeing and lives of billions of people are being impacted on through economies becoming more risky, ecosystems becoming more fragile, and societies and communities becoming more fragmented. To respond to these challenges, what is required is the ability of our societies to screen, analyze, select, protect, nurture, and develop essential resources for, and positive ways of, healthy living. To do so will benefit each society and the world community as a whole.

This approach is captured in the concept of healthy public policy, introduced by the Ottawa charter for Health Promotion in 1986¹. Healthy public policy aims to create supportive environments to enable people to lead healthy lives. Since our societies are complex and interrelated, healthy public policy must link economic, social, ecological and health into integrated development strategies and actions. At the same time, a healthy public policy should assign high priority to underprivileged and vulnerable groups within societies². The main idea of healthy public policy is as follows:

- to put health on the agenda of policy-makers in all sectors and at all levels;
- * to direct them to be aware of the health consequences of their decisions; and
- to accept their responsibilities for health.

It is also very important to identify obstacles to the adoption of healthy public policies in non-health sectors, and the ways to remove them. Healthy public policy efforts should aim to make healthier choices the easier choices for policy-making³.

The Ottawa charter also stresses that "health promotion is the process of enabling people to control over and to improve their health". This means the empowerment of communities – their ownership and control of their own endeavors and destinies should be at the heart of healthy public policy strategy. In doing so, healthy public policy must also increase the options available to people to exercise more control over their own health and over their environments, and to make choices conducive to health.

Healthy public policy is, therefore, one of the key concepts for every society to protect and promote the health of their populations in an increasingly complex, dynamic and risky world. Healthy public policy means integrating a health dimension into more upstream policy process or at the early stage of decision-making process and into broader sustainable development goals, and, at the same time, empowering people to have more control over their health, lives, and destinies.

1.3 HIA and Health Promotion

A commitment to healthy public policy means that governments, at national and local levels, must measure the health impacts of their policies, and communicate these findings with their communities and societies. In doing so the systematic assessment of the health impacts of a rapidly changing environment is essential and must be followed by action to ensure positive benefits to health of the public⁵.

Following this idea, Health Impact Assessment (HIA) was recently developed as an essential tool for putting health into the consideration of all policy-makings. HIA has been defined by WHO as:

"a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on health of population, and the distribution of those effects within the population".

In the UK, the HIA gateway has described HIA as:

"a developing process that uses a range of methods and approaches to help identify and consider the potential – or actual – health and equity impacts of a proposal on a given population".

Although there are a number of ways of defining HIA, it is clear that its primary output is:

"a set of evidence-based recommendations geared to informing decision-making process".

More importantly, the fundamental goal of HIA goes beyond just providing information,

"the aim of HIA is to achieve changes in policies and proposals so that they support better health and reduce health inequalities".

In other words, HIA tries not only to project the impacts of policies, programmes, and projects, but also to influence the political decision-making process on the basis of its findings and processes 10.

HIA, therefore, has its own specific role compared to other tools in health promotion. HIA aims to provide a mechanism to achieve the engagement of other sectors in health promotion through the assessment of and recommendations for inter-sectoral actions. In pursuing this goal, HIA needs to address changes in health determinants "upstream" in the planning process, in order to find health opportunities within development processes.

However, since HIA is planned to be used with non-health sectors, HIA cannot be only a technical tool for use by public health specialists. Instead it has to be a tool that is accessible to and accountable for different stakeholders across sectors within societies. In this sense, HIA should be recognized as the bridge for integrating health dimensions into development processes, and at the same time, as the window for the health sector to participate more proactively and meaningfully in wider public spheres.

Introduction to HIA 5

1.4 The Development of HIA in the Recent Years

The development of HIA in recent years has occurred through two different streams or approaches which are; the first stream is as a part of "environmental impact assessment" (EIA) 11, and the second stream is evolved from the concept of "healthy public policy".

1.4.1 HIA as a part of Environmental Impact Assessment

This approach, usually called environmental health impact assessment (EHIA), was initially promoted by the WHO in the 1980s to address neglected health considerations in conventional EIA¹². This is because although legal frameworks for EIA in many countries already include health impacts as a compulsory element, in practice, this is often poorly done¹³.

EHIA is based on the bio-medical model of health, and assesses changes to mortality, morbidity and injuries ¹⁴. As a result EHIA is mainly based on epidemiology and toxicology. Due to its focus on specific cause-effect relationship, this approach is sometime called the "tight perspective" ¹⁵ (see more details in Part II).

This approach was firstly applied to large infrastructure projects in developing countries. At present, EHIA is practiced in developed countries such as Australia, New Zealand, and Canada ¹⁶. Several regional offices of the WHO have funded a number of projects involving workshops and guidelines on EHIA in some countries ¹⁷. Additionally, some international donor agencies and financial institutes have paid interest in integrating health into their project appraisal processes ¹⁸.

1.4.2 HIA as Evolving from the Concept of Healthy Public Policy

The second stream of HIA is evolved from the concept of "healthy public policy". While the idea of policy impact assessment on population health is not new, the emphasis on the relation between impact assessment and decision-making is relatively new ¹⁹. In 2000, at the 5th Global Conference on Health Promotion, HIA was proposed to be "a device for forcing the relevance bodies to take action in favour of healthy public policy" and "a potential catalyst for inter-sectoral action for health".

This approach is based on the socio-environmental model of health, which considers wider determinants of health including individual, social, economic, and institutional factors ²¹. Some researchers refer to this approach as the "broad perspective" (see more details in Part II).

This approach is now popular in developed countries, such as Canada, the UK, Sweden, and the Netherlands 23. Concurrently, some developing countries, like Thailand, have also played an active role in developing HIA in their health system reform 24. Recently, this HIA approach also applied in Australia to raise awareness and address health inequalities, called equity-focused health impact assessment (EFHIA) 25. In addition, HIA within this approach has been applied to various inter-sectoral policy developments including housing,

transportation, agriculture, energy, urban planning and so on, from the local to national levels to the international level 26

1.5 HIA Methodological Development

Although there is no fixed, formally agreed model of applying HIA, there is a developing consensus about core elements or stages of the HIA process ²⁷. In general, the HIA process follows the same steps as those in EIA and Strategic Environmental Assessment (SEA).

- HIA begins with clarifying which policy options (or programmes or projects) are to be compared with respects to their health impacts (screening).
- Then, the range of health concerns and issues raised by those policies are identified (scoping).
- These first two steps also allow relevant questions to be identified by different stakeholders. These questions are then addressed based on appraisal or analysis of health impacts (appraisal).
- A formal report is drafted with stakeholders involved, after which the stakeholders again have the opportunity to debate and discuss the findings (reporting and reviewing) and their implications and influences for decisions on policy options, including mitigation measures (influencing).
- Finally, monitoring of health impacts follows the policy implication, so that the effectiveness of the process can be assessed and any expected results can be identified (monitoring and evaluation)²⁸.

HIAs can include the application of a wide variety of tools and methods; for example,

- literature reviews;
- epidemiological modeling of risk;
- * key informant interviews; and
- focus groups to elicit community views and perceptions.

However, because HIA is relatively new and developing approach, it can be difficult to determine the most appropriate methodological approach for HIA. In practice, the methods used are depended very much on what is being studied and the possibility for interdisciplinary co-operation. This flexibility is often seen as strength of HIA. However, there is a need for further methodological developments that are at the same time both "universally accessible" and appropriate for "any users or groups" of HIA practitioners.

Although the main goal of HIA is to provide evidence-based recommendations, in reality appraising evidence can also be complex because of the interrelationship between different health determinants and the many causal pathways between these and their impact on health. Moreover, it is also difficult to isolate the influences of particular policy interventions on complex and dynamic social systems. Therefore, when predicting health impacts in complex situations, it needs to be understood as "the prediction of *tendencies and types* of impacts" rather than absolute measures ³⁰.

Introduction to HIA

1.6 Underpinning Principles of HIA

The following underpinning principles and values of HIA have been revised based on recent developments in HIA from various countries, ^{31 32 33} and are summarized below to form guidance for those undertaking or considering HIAs;

- Democracy: HIA should assert and promote the right of people to participate in the formulation of policies that affect their lives, through representatives and direct public involvement.
- **Equity**: HIA should aim to reduce inequalities by assessing the differential distribution of health impact across the population.
- Ethical use of evidence: HIA should identify and use quantitative and qualitative evidence appropriately and rigorously from different disciplines and methodologies.
- Practical: HIA should be designed to fit appropriately to the time and resources available to undertake an HIA, and the recommendations should be appropriate and actionable within current societal resources and contexts.
- Collaborative: HIA should promote shared ownership with different stakeholders, encourage inter-disciplinary viewpoints in its process, and support the integration into public policy processes at different levels across health and other sectors.
- Holistic approach to health: HIA should emphasize on the wider determinants of health or a broad range of factors from all sectors of society which can affect on health of population.
- Sustainable development: HIA should assert and emphasize principles and goals of sustainable development as core elements of a healthy society.

1.7 HIA and Policy-making

For HIA to add value, it should be able influence decision-making and policy directions by taking into account decision-making structures and political processes. However, while HIA has a clear aim in influencing policy decision-making ³⁴, early versions of HIA incorrectly assumed a linear process with a direct link between impact assessment and decision-making processes.

For example it has been noted that in Australia³⁵ the links between policy development and the usefulness of HIA were often not explicitly made in many HIA studies. In other words, in such studies, HIA has developed "without real consideration of the political and administrative frameworks within which it has to operate³⁶. Therefore, many HIAs failed to communicate to decision-makers, to be relevant to policy development, or arrived too late to influence decision-making³⁷.

Fortunately, more recent versions of HIA have tended to place greater emphasis on decision-making structures and political processes ³⁸. This requires HIA process to fit with decision-making rules and procedures, including timeframes these decisions are made within ^{39 40}. Some studies and guidelines also suggest that HIAs are more likely to inform decision-making if the decision-maker own the assessment process and report, and are

closely involved in all stages of the HIA. However, on the other hand, involving decision-makers may mean difficulties with conforming to the principle of openness and transparency ⁴¹. Moreover, in various cases, entrusting HIA to policy-makers could be dangerous, especially in countries where corruption may be occurring ⁴².

The UK experience shows that HIAs can successfully influence policy-making such as in formulating mayoral strategies for London 43 or in urban development projects 44. The key to success in applying HIA to influence the decision-maker here was as follows:

- strong political commitment;
- * participatory processes of different stakeholders; and
- finding effective ways in fitting a non-statutory assessment into statutory planning framework.

The importance of enabling institutional infrastructure can also be seen in other HIA reviews 45 , including those in developing countries 46 47.

Since policy-making in reality is subject to a range of influences, it can be difficult to establish a cause & effect relationship between HIA process and subsequent policy decisions ⁴⁸. As a result, the success of HIA should not necessarily be evaluated as being a one-off event, but more as "a continual effect that bring change in organizational thinking about health and subsequent decision-making" ⁴⁹. Taking this viewpoint also asserts the importance of long-term involvement in the development of healthy public policy ⁵⁰.

The more moving forward to the long-term involvement in policy-making processes, the more comprehensive policy analysis frameworks has been also developed, at least, in the Netherlands and Thailand Section 2. Such frameworks provide HIA practitioners a lens for analyzing public policy processes and domains, and to better identify appropriate or effective means to participate in the policy development process (see more details in Part IV).

1.8 Future Platforms of HIA Development

As highlighted earlier, HIA has been developed in different ways for different purposes. Each of these approaches has gradually built up their approach to fit with their purposes and the conditions each is used within. Although all approaches share common objectives, it is useful to foresee different future trajectories for HIA. In this training manual, four main platforms for HIA development have been identified.

1) Project-based HIA

Project-based HIA is the approach that applies HIA to analyze the impacts in project approval process. HIA within this project based is often applied as part of a broader EIA process. In several countries, the project-based HIA have been, or will be, legally recognized within EIA or EIA-related law, as seen recently in Thailand. Although the strength of this approach is that it works within clear institutional frameworks, it is less proactive compared to other HIA approaches. This is because it requires that the project proposals are complete before it is begun. As a result there is often less opportunity to change policy directions and, in some cases, to analyze the project or policy alternatives.

Introduction to HIA

2) Policy-based HIA

Policy-based HIA has been applied to influence changes in policy direction. This often allows more proactive involvement than project based HIAs. At this policy level, HIA normally presents broader strategic results, but less specific results when compared to projected-based HIA. In policy-based HIA, HIA should be involved in policy discussions over the long-term.

In general, policy-based HIA is not required by law. In some countries, governments have special agreements or policies to conduct HIA for policy analysis and screening. Conversely in other countries, policy-based HIA may be difficult to be implemented due to difficult political contexts to operate within.

3) Community-based HIA

Community-based HIA shares the proactive characteristics of policy-based HIA. However, due to its local level of implementation, community-based HIA applies different methods and tools than policy-based HIA, both in terms of analytical practices and public participation process. Moreover, while policy-based HIAs usually involve in long-term process of specific sectoral policy and planning (such as transportation or energy), community-based HIA usually focuses on specific problems in the local community and can easily shift the focuses from one specific issue to other issues, if needed.

4) HIA across the border

The last approach refers to HIAs that cover cross-border policies and projects, such as free trade agreements or the large hydropower dams traversing countries in the Mekong region. The importance of this approach has been emphasized in the Bangkok Charter on Health Promotion in a globalised world. On the one hand, HIA across borders can share approaches with either project-based HIA (when applied to large infrastructure projects) or policy-based HIA (when applied to policy issues, such as free trade agreements). On the other hand, due to its international institutional setting, its implementation practices differ greatly from all three above-mentioned approaches. In practice, especially in South-east Asia, this HIA approach has had very limited implementation. However cross-border health impacts are becoming more obvious, particularly in South East Asia, and so this is an area of considerable opportunity for HIA in future.

1.9 Practical Difficulties and This Training Approach

Although HIA around the world has been established and developed for almost two decades, resulting in enriched methodology and experiences, in practice, HIA practitioners still face some important difficulties. In Thailand, five major difficulties have been generally found that face the HIA process. These five practical difficulties include:

- ❖ Different Perspectives on Health and Health Impacts. Both health professionals and ordinary people look at health and health impacts in different ways. Some of them refer to health as the absence of disease, which implies the analyzing health impacts in diseases or quantitative scale, while others recognized health as a holistic well-being approaches. Without advanced preparation, it can be that these two perspectives have difficulties in working together on HIA, due to their different ways of recognizing and measuring the health impacts. However, prior to working on the HIA, group discussions concerning different health models provide the opportunity to deal with these potential difficulties.
- ❖ Lack of Clear Appropriate Policy and Project Alternatives. In Thailand it has been found that several HIA studies have been done without offering clear and innovative policy and project alternatives. In these studies, HIA loses its opportunity to introduce healthier policy directions and practices by limiting itself to specific proposals. To overcome this in practice, HIA practitioners need to develop systematic and creative ways of understanding, creating or linking to policy and project alternatives.
- Limited Evidence and Lack of Appropriate Analytical Practices. Like other developing countries, Thai HIA practitioners face incomplete evidence-based information. This limitation makes HIA become much more difficult to reach the agreeable conclusions especially in situations where conflicting views and values become apparent. Making a recommendation to upgrade evidence-based information in developing is one of our most well-known recommendations. However this is mostly out of the control of HIA practitioners and their supporting institutions. Linking to the evidence base in developed countries may be more practically possible, but the questions will exist concerning the relevance of the evidence to the very different contexts of developing countries. Another possible way is to develop different approaches and skills which can be used in conditions where limited technical data exists, such as the collection of community-based evidence.
- ❖ Influencing Decision-making or Policy-making Processes. As mentioned earlier, the objective of HIA is not only to inform the decision-making process but to gear to policy towards a healthier policy direction. Influencing decision-making and policy-making process is vital for if HIA is to be considered successful. Certainly, involvement in public policy process is very complicated, and difficult to predict. Developing frameworks for analyzing public policy processes should be done to guide HIA practitioners in constructive interactions within policy process.
- Facilitating Meaningful Public Participation. Public participation is the key process and strength of HIA. However, in the reality, facilitating meaningful public participation is not an easy job, especially when it is occurred within conflict

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situations and complicated public policy process. Meaningful public participation requires appropriate process, tools, skills, and enabling environments.

Given the importance of these real difficulties in HIA practice, and the fact that these are crucial to overcome if HIAs are to be implemented successfully, this training focuses on tackling these five difficulties in HIA process rather than describing the step-by-step in HIA process. It is important to note that the step-by-step is not seen as less appropriate or effective than our approach offered here. On the contrary, taking a step-by-step approach is very useful and necessary. However, almost all countries in the South-east Asian region have already conducted step-by-step HIA training in their own countries. Therefore this is an opportunity to compliment the conventional step by step one, and combine to add greater value in strengthening capacity for HIA development within this region.

A Summary of Key Points

- Healthy public policy is the bridge for integrating health dimension into upstream development process and empowering people to have more control over their health, lives and destinies.
- HIA provides "a set of evidence-based recommendations gears to informing decision-making process".
- HIA provides a mechanism to achieve the engagement of other sectors in health promotion, through the assessment of and the recommendation for inter-sectoral actions.
- HIA method applies a wide variety of tools, such as literature reviews, epidemiological studies, mapping, key informant interviews, focus groups to elicit community views and perceptions etc.
- Underpinning of HIA is; democracy, equity, ethical use of evidence, practicability, collaboration, collaboration, comprehensiveness, and sustainability.
- Decision-making is not a linear process, applying HIA to influence policy-making it needs to analyze policy process prior.
- Present and Future Platforms for HIA Development: 1) project-based HIA, 2) policy-based HIA, 3) community-based HIA and 4) HIA across the borders
- Practical Difficulties in HIA
 - Different perspectives on health and health impacts
 - Lack of clear appropriate policy and project alternatives
 - Limited Evidence and lack of appropriate analytical practices
 - Influencing decision-making process
 - Facilitating meaningful public participation

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PART II

Analyzing Potential Health Impacts

PART II Analyzing Potential Health Impacts

In this part we will discuss about understanding of health, different perspectives of health impacts, and different approaches to analyze potential health impacts. This understanding is significant for determining different approaches to design HIA process. Without a clear understanding of these differences, HIA practitioners may face with difficulties when conducting HIA.

This part covers the following issues:

- Determinants of health
- Approach to understand health impacts
- Dimensions of health impacts

The range of potential health impacts to be measured and analyzed in HIA depends on the definition of health employed by those conducting the HIA. There are two different perspectives on health that are mainly applied in HIA. On the one hand health can be associated with the absence of disease – a 'tight' approach to health - or on the other hand as associated with well-being – a 'broad' approach . Not establishing a clear understanding of these different health perspectives may give rise to difficulties when conducting the HIA, as each perspective leads to different ways of analyzing and measuring health impacts.

Before analyzing potential health impacts, it is necessary to consider the main determinants of health, as this will help identify potential health impacts carefully. Moreover, the comprehension on approach to understand health impacts and dimensions of health impacts is also important to widen our understanding toward comprehensive health impacts.

2.1 Determinants of health

Determinants of health are factors which influence health conditions and determine health differentials or health inequalities and inequities. Approaches to understanding health determinants can be categorized into 3 types, which are:

- * a 'health risk model';
- * 'comprehensive standard'; and
- 'local-based approach'.

The first model is based on biological 'tight' approach, while the others are based on a 'broad' social determinants approach.

Box 2.1 Equity in relation to HIA² (broad approach to health)

Equity in relation to HIA

In HIA equity is concerned with making clear if a proposal will differentially impact on different groups. Differential impacts refer to whether the benefits of the proposal may be experienced by one group and not others, or whether the negative impacts of a proposal may be experienced by one group and not others. For example a freeway may make it easier for people to travel to and from work but may also have negative impacts on the air quality and noise for people living near the freeway.

In a HIA this may involve a judgment concerning whether this difference is considered unfair and is able to be altered. This is especially true if one group is seen to carry a higher burden of disadvantage or risk of being disadvantaged. For example whether major roads go through poorer areas and skirt around richer areas.

2.1.1 Health Risk Model

Determinants of health under this approach are defined as factors that are directly harmful to human health and can cause disease, infirmity or disability. These may result from exposure to specified health hazards; inborn or inherited characteristics; or personal lifestyle or risky behaviors, which, on the basis of epidemiological evidence lead to disease, infirmity or disability.

According to health risk model, health hazards and health risks are the main influential factors determining health conditions. Under this approach, biological knowledge and scientific data are mainly used in order to prove the causal relation of a specific risk factor that may affect to human health. Risk factors can be diagnosed clinically and the model is concerned primarily with treating symptoms rather than their underlying causes.

Box 2.2 Difference between health hazard and health risk

A health hazard is an agent that may cause harm

A **health risk** is a measure of likelihood that an identified hazard causes harms to a particular group of people at a particular time and place

Health hazards can be classified into the following categories:

- Agents of communicable diseases;
- The change of environment and agents/causes of non-communicable diseases;
- Causes of malnutrition;
- Causes of injury; or
- Causes of psychosocial disorders

Box 2.3 Example of health hazards

Health Hazards are not always Health Risks

The malaria parasite is a health hazard in the tropics. However, malaria may be a very small health risk in the middle of many large cities in the tropics, because the mosquitoes that transmit the infection are likely to be absent

Table 2.1 Determinants of health under health risk model

Categories of influences on health	Examples of determinants of health
biological factors	age, sex, genetic factors, inborn or inherited characteristic
behavior and lifestyles	smoking, alcohol consumption, diet, physical activity, safe sex and other risk-taking activity
environment	air and water quality, noise, smell/odor, built environment, housing an working conditions, waste disposal, toxic substance, diseases injury hazards, accidents

Box 2.4 The Mab Ta Phut Industrial Estate in Thailand³, an example of determinants of Health under the health risk model

The Case of Mab Ta Phut Industrial Estate

Mab Ta Phut Industrial Estate is recognized as one of the biggest industrial areas in Thailand. The operations of various industries in the Estate were found to cause serious environmental and adverse health risks to local communities for several decades.

Examples of Determinants of health

Air pollution – various kinds of terrible smells mainly from petrol-chemical and oil refinery industrial production. Twenty out of twenty-five communities suffered from this air pollution.

Chemical Accident — Many chemical accidents occur each year, both in the chemical plants themselves and in the chemical transportation process. From 1996 to 2001, the overall trend of chemical accident cases in this area increased in number.

Water Pollution – Currently, both the quality of fresh and seawater have significantly deteriorated due to the chemical contamination from both air and groundwater pollution.

Illegal Hazardous Waste Dumping — The illegal hazardous waste dumping, caused by ineffective environmental management systems, has been found in many places on the Estate, leading to the contamination of soil, canal, and groundwater.

2.1.2 Comprehensive Standard

Determinants of health under this approach refer to the **complex set of factors or conditions that influence or determine human well-being.** It is now generally accepted that human well-being are affected by social, economic and environmental factors, as well as biological factors, such as age and sex.⁴ We call the range of factors affecting health as 'Comprehensive Standard' of determinants of health.

Examples of the comprehensive standard models of the determinants of health include the Merseyside model, the Canadian model, or Dahlgren and Whitehead's model. The details of each model will be described more in the following sub-topics.

1) The Merseyside Model

The determinants of health under the Merseyside model are divided into 6 categories, which are:

- biological factors;
- personal/family circumstances and life style;
- social environment;
- * physical environment;
- * public services; and
- * public policy.

Examples of key health determinants under this model are illustrated as the following table:

Table 2.2 Determinants of health of the Merseyside model⁵

Categories of influences on health	Examples of specific influences (health determinants)
Biological factors	Age, sex, genetic factors
Personal/ family circumstances and lifestyle	Family structure and functioning, primary/secondary/adult education, occupation, unemployment, risk-taking behavior, diet, smoking, alcohol, substance misuse, exercise, recreation, means of transport (cycle/car ownership)
Social environment	Culture, peer pressure, discrimination, social support (neighborliness, social networks/isolation), community/cultural/spiritual participation
Physical environment	Air, water, housing conditions, working conditions, noise, smell, view, public safety, civic design, shops (location/range/quality), communications (road/rail), land use, waste disposal, energy, local environmental features
Public services	Access to (location/disabled access) and quality of primary/community/secondary health care, child care, social services, housing/leisure/employment, social security services, public transport, policing, other health-relevant public services, non-statutory agencies and services
Public policy	Economic/social/environmental/health trends. Local and national priorities, policies, programs, projects

2) The Canadian Model

Canada has conducted a number of studies for several years, in order to identify what are crucial determinants that influence health of Canadian people. At present, determinants of health of Canadian people comprises of 12 factors as follows:

- income and social status;
- social support network;
- education and literacy;
- employment/working conditions;
- physical environment;
- social environment;
- personal health practices and coping skills;
- healthy child development;
- biology and genetic endowment;
- health services;
- culture; and
- spender.

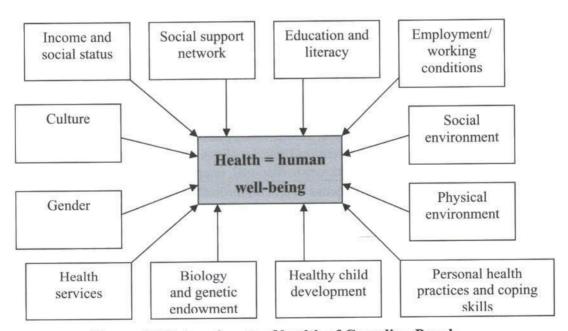


Figure 2.1 Determinants of health of Canadian People

Table 2.3 Determinants of health under the Canadian Model

Determinants of health	Explanation
Income and social status	High income determines living conditions such as safe housing and ability to buy sufficient good food. The healthiest populations are those in societies which are prosperous and have an equitable distribution of wealth.
Social support network	Support from families, friends and communities is associated with better health. Such social support networks could be very important in helping people solve problems and deal with adversity, as well as in maintaining a sense of mastery and control over life circumstances.
Education and literacy	Education contributes to health and prosperity by equipping people with knowledge and skills for problem solving, and helps provide a sense of control and mastery over life circumstances. It increases opportunities for job and income security, and job satisfaction. And it improves people's ability to access and understand information to help keep them healthy.
Employment/working conditions	Unemployment, underemployment, stressful or unsafe work are associated with poorer health. People who have more control over their work circumstances and fewer stress related demands of the job are healthier and often live longer than those in more stressful or riskier work and activities.
Social environment	Social stability, recognition of diversity, safety, good working relationships, and cohesive communities provide a supportive society that reduces or avoids many potential risks to good health.
Physical environment	Hazard exposure, contaminants in our air, water, food and soil can cause a variety of adverse health effects including cancer, respiratory illness, etc. In the built environment, factors related to housing, indoor air quality, and the design of communities and transportation systems can significantly influence our physical and psychological well-being
Personal health practices and coping skills	Personal health practices and coping skills refer to those actions by which individuals can prevent diseases and promote self-care, cope with challenges, and develop self-reliance, solve problems and make choices that enhance health.
Healthy child development	New evidence on the effects of early experiences on brain development, school readiness and health in later life has sparked a growing consensus about early child development as a powerful determinant of health in its own

Determinants of health	Explanation
	right. For example, a young person's development is greatly affected by his or her housing and neighborhood, family income and level of parents' education, access to nutritious foods and physical recreation, genetic makeup and access to dental and medical care.
Biology and genetic endowment	Genetic endowment provides an inherited predisposition to a wide range of individual responses that affect health status. Although socio-economic and environmental factors are important determinants of overall health, in some circumstances genetic endowment appears to predispose certain individuals to particular diseases or health problems.
Health services	Health services, particularly those designed to maintain and promote health, to prevent disease, and to restore health and function contribute to population health. The health services continuum of care includes treatment and secondary prevention
Gender	Gender refers to the array of society-determined roles, personality traits, attitudes, behaviors, values, relative power and influence that society ascribes to the two sexes on a differential basis. "Gendered" norms influence the health system's practices and priorities. Many health issues are a function of gender-based social status or roles.
Culture	Some persons or groups may face additional health risks due to a socio-economic environment, which is largely determined by dominant cultural values that contribute to the perpetuation of conditions such as marginalization, stigmatization, loss or devaluation of language and culture and lack of access to culturally appropriate health care and services.

3) Dahlgren and Whitehead's Model

The Dahlgren and Whitehead's model has considered health outcomes as the results of interactions between different levels of causal conditions, ranging from the individual as the inner layer until the outer layer which refers to general socio-economic, cultural and environmental conditions (see figure 2.2).

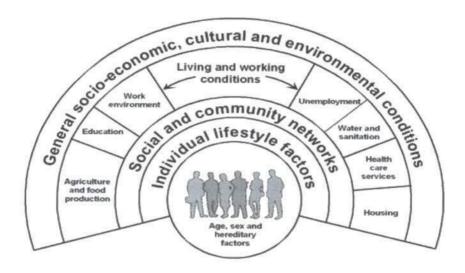


Figure 2.2 the Main Determinants of Health of Dahlgren and Whitehead's model

Table 2.4 Determinants of health of Dahlgren and Whitehead's model⁸

Determinants of health	Explanation
Age, sex and hereditary factors	Individuals are at the centre of the picture, undoubtedly, age, sex and genetic factors influence human health potential.
Individual lifestyle factors e.g. diet, smoking, exercise	The next layer represents personal behaviors and lifestyles. People in disadvantage circumstances tend to encounter risky behavioral factors such as smoking and poor diet, and will also face greater financial barriers to choosing a healthier lifestyle.
Social and community networks e.g. social support, community relation	Social and community influences are represented in the next layer. These social interactions influence personal behaviors, for better or worse. Having fewer networks and support systems may lead to mental health impacts as they cannot cope with any adverse psycho-social problems.
Living and working conditions e.g. environmental circumstances, quality of house	At the next level up, we find factors related to living and working conditions, food supplies and access to essential facilities and services. In this layer, poorer housing conditions, exposure to more dangerous or stressful working conditions and poorer access to services create differential risks for the socially

Determinants of health	Explanation
	disadvantaged.
General socioeconomic, cultural and environmental conditions e.g. public policy	These conditions, such as the country's economic state and labor market conditions have a bearing on every other layer. The standard of living achieved in a society, for example, can influence an individual's choice of housing, work and social interactions, as well as eating and drinking habits. Similarly, cultural beliefs about the place of women in society or pervasive attitudes to minority ethnic communities can influence their standard of living and socioeconomic position.

2.1.3 Local-Based Approach

This third approach shares the same basis as the Comprehensive Standard approach and includes the complex set of factors or conditions that influence or determine human well-being. However, within the local-based approach these determinants mainly depend on the specific context of each community and that community's values concerning health and well-being. The following box, the case of Pak Mun Community, is an example of determinants of health under the local-based approach.

Box 2.5 The case of Pak Mun Community in the Northeastern Thailand, an example of determinants of health under the local-based approach.

The Case Pak Mun Community (1)

The Pak Mun Hydropower Dam is the first run-of-the-river dam in Thailand. It is located on the Mun River, 5.5 km. before reaching the Mae Kong River. The dam operation causes the obstruction of the natural fish migration from the Mae Kong River. This has been resulted in the sharp decrease of fishery resources in the Mun River, on which the local communities depends their livelihood for generations.

The Definition of Health in the Pak Mun Community Viewpoint

According to the villagers' point of view, health is "living happily and peacefully together with the family and community, and within the natural environment, which can be ensured their secure livelihoods and community culture". The villagers also determine 6 factors for healthy living, as follow;

* Having enough food. One villager said that, for her, food security means that, "when I am going to sleep, I do not worry what will be the food for my children tomorrow". They also mention that "enough food" does not only mean enough food for their family, but also food for sharing and donation.

The Case of Pak Mun Community (2)

- Secure livelihood. Secure livelihood means they do not worry about financial costs and expenditure on health when they get sick and educational costs and expenditure for their children. They also wish to own their farmland, livestock, and saving money, according to their own capabilities.
- * Happy Family. For them, happy family means all three generations grandparents, parents, and children are living together within the family, and learning from their parents how to secure their livelihoods, including maintaining supportive relationship with their relatives.
- Healthy Body. Healthy body means they can exercise and continue their jobs and activities. It also means they can live without severe diseases and syndromes, travel without moving sickness and listen to regular long Buddhist preaches without painful beriberi.
- Peaceful spirituality. They hope that their mind should be free from the anxiety of food insecurity, sickness, poverty, and conflicts. They should also join every Buddhist ceremonies together at their community temples.
- Generous Community. Generous community means they can live and share with their neighbors. Within the community, they can develop their community and organize regular donation and activities together, with the strong and shared spirit.

According to their definition of health and their own ways of living, they define four main determinants of health, as mentioned below;

- 1. Natural Resource Security includes (a) the fertile arable land, (b) naturally flowed river, (c) fertile forest (d) natural rapids, (e) diversified fishes, and (f) herbs and local vegetable.
- 2. Food Security concerns with (a) diversified food sources (b) food safety, and (c) food availability.
- 3. **Economic Security** concerns with (a) income, (b) expenditure, (c) saving, and (d) debt.
- 4. **Social Environment** includes (a) togetherness, (b) supportive relationship, (c) shared activities, and (d) shared regular donations and ceremonies.

As shown in the above examples, understanding of the different determinants of health will expand our knowledge and understanding on potential health impacts. Furthermore, the underlying causes of health impacts will be seriously taken into account.

2.2 Approaches to Understand Health Impacts

From different understandings and various sets of determinants of health mentioned in the previous topics, there are two approaches to understand and analyze health impacts, which are:

- * Tight Perspective; and
- Broad Perspective.

2.2.1 Tight Perspective

Health impacts under this perspective are analyses and measured on the basis of defining health as the absence of disease, infirmity or disability. This approach rests upon the need to clarify a direct causal relationship between a hazard, risk, and health effect. Systematic monitoring and data collection is important to analyze and identify health hazards, such as toxic substances, pollution, and diseases. This perspective often focuses on the assessment of the direct affects of pollutants and frequently uses risk assessment and epidemiological methods.

Furthermore, analysis of health impacts is based on quantitative studies; for instance health impacts assessment of sulfur dioxide from a power plant and the rate of respiratory disease in the local community. Methods used in this perspective include risk assessment, epidemiology, or toxicology.

2.2.2 Broad Perspective

According to broad perspective, health impacts are considered as part of a dynamic association between various factors and effects rather than causal relationship. The analysis of health impacts within the broad perspective examines socio-economic context and social structure of societies and the community. The perspective also incorporates multidisciplinary approaches and methods, such as those used in psychology, sociology, and anthropology, to better understand the inherent complexity of factors that make up a broad definition of health.

Indigenous knowledge and participation of people and communities in the broad approach are crucial as these provide and inform data and information for the analysis and measurement of health impacts to include better understanding of the dynamics of and interactions between the many factors that affect health. Therefore several kinds of tools have been developed that include community risk mapping, body risk mapping, and bioregional mapping.

Table 2.5 Characteristics of tight and broad perspectives 10

Dimension	Tight perspective	Broad perspective
View of health	Emphasis of defined and observable aspects	holistic
Discipline for analyzing health impacts	Epidemiology, toxicology	Sociology
Ethos	Technocratic	democratic
Quantification	Towards exact measurement	In general terms
Type of evidence	Measurements	Key informant data; popular concern
Precision	High	low

 $\begin{tabular}{l} \textbf{Table 2.6 Characteristics of indicators for different perspectives of analysis of health impacts \end{tabular}$

Indicators for tight perspective	Indicators for broad perspective
Specific- Indicators must show what the project aims to change or make direct impacts upon, avoiding impacts arising from other factors	Subjective- Indicators should portray the experiences or perspectives of key informants, which provide broad and diverse viewpoints about the project's impacts.
Measurable and unambiguous- Indicators must precisely measure and identify values and must be able to compare between groups and periods of time.	Participatory - Indicators should be developed from the project's affected areas and should allow the participation of stakeholders.
Attainable and sensitive- Indicators should show the attainable changes from the project as well as the sensitivities resulting from changes in project's characteristics.	Interpret and Communicable - The indicators must be explained or defined from the perspectives of different groups e.g. affected people, benefited groups, experts, academics, authorities, in order to facilitate the communication among them.
Relevant and easy to collect- Indicators should allow the researchers to easily store and collect data within the limits of time and cost which are reasonable and relevant to the project's impacts.	Cross-check and compare- The correctness of data must be examined by comparing between different indicators, key informants, methods and analysts.
<i>Time bound</i> - Indicators should show or explain the periods of time in which changes are attainable.	Empowering- The formulation process of indicators and assessment should be supportive to the empowerment of people by encouraging different groups to voice their views and experiences concerning the project. Diverse and disaggregate- The effort should
	be made in finding different indicators for different groups of the population – for example in terms of age and gender. These records should be described in a way that shows differences in each period of time.

2.2.3 Connection between Tight and Broad Perspectives

The tight and broad perspectives are not opposed to each other, and can be seen as complementary. The World Health Organization's Health and Environment Cause-Effect Framework or DPSEEA model (Driving Forces-Pressures-State-Exposure-Effects-Actions) is one example of a model that can be applied to connect the tight and broad perspectives. The main components of DPSEEA model are depicted as the following figure.

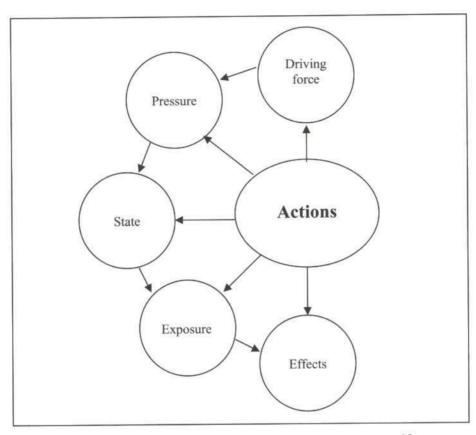


Figure 2.3 The main components of DPSEEA model 12

The "driving forces" component of the model refers to the factors that motivate and push the environmental processes involved. These result in the generation of pressures on the environment. In response to these pressures, the state of the environment is often modified or altered. Deterioration in the state of the environment, however, poses risks to human well-being only when there is interplay between people and the hazards in the environment.

Exposure is therefore rarely an automatic consequence of the existence of a hazard: it requires that people are present both at the place and during the time that the hazard occurs. Exposure to environmental hazards, in turn, leads to a wide spectrum of health effects, which may be acute or chronic. Some hazards may have a rapid effect following exposure, whereas others may require a long time to produce an adverse health effect. The concept of exposure is best developed in relation to pollutants in environmental media. The amount of the pollutant absorbed, i.e. the "dose", depends on the duration and intensity of the exposure.

In face of the environmental problems and consequent health effects, society may attempt to adopt and implement a range of actions. These may take many forms and be targeted at different points within the environment—health continuum. Actions may be taken to reduce

or control the hazards concerned, such as by limiting emissions of pollutants or introducing flood control measures. The most effective long-term actions, however, are those that are preventive in approach, aimed at eliminating or reducing the forces that drive the system, 13.

The case study of Thungthong Community in the Central Thailand, is an example that had applied the concept of connection between tight and broad perspectives to explain pesticide impacts.

Box 2.6 The case of Thungthong Community in the Central Thailand, an example that applied the connection between tight and broad perspectives.

Introduction to Thungthong Community

Thungthong community is located at Sai Thong Wattana district, in Kampangphet Province, in central Thailand. Most of local people there are farmers and paddy rice fields are the main crops in the area. Pesticides and agro-chemicals have been widely used in this area and becoming the serious problems of the community.

The following figure is shown the relationship between increasing pesticide uses and health impacts on the local community ¹⁴.

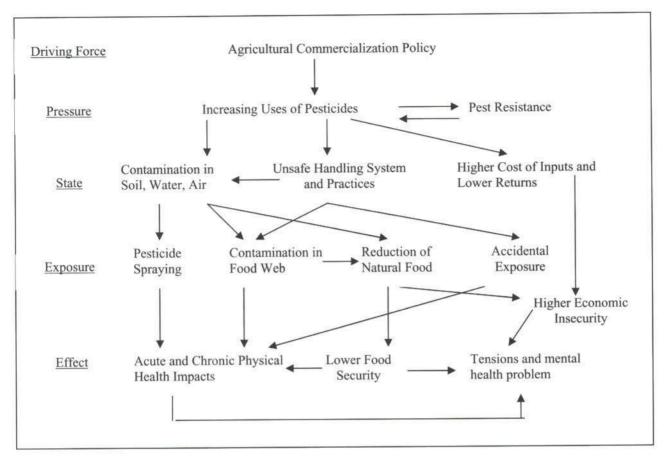


Figure 2.4 The DPSEEA Model of Potential Health Impacts from Increasing Pesticide Uses

Using the DPSEEA Model can provide the link between the tight and broad perspectives on health. The tight perspective tends to focus on analyzing the exposures and effects, while the broad perspective attempts to deal with the association between the changes of socio-economic and environmental factors and health impacts.

By putting the two perspectives together the DPSEEA Model can provide a more comprehensive picture of health impacts, from exposure and effect to driving forces and pressures that created the impact. Therefore, the recommendations and actions can go beyond mitigating health risks and improving health services to other policies in non-health sectors and the underlying causes of the impacts. Furthermore, the recommendations can be formulated in each component or stage of the model, leading to a more complete policy and plan for dealing with the health impacts.

Table 2.7 Recommended policy and actions in protecting health from increasing pesticide uses in the local level and National level 15.

Levels of Action	National Level	Local Level
1. Driving Force	 Policy targeting 50% reduction in pesticide use Supportive policy for alternative healthy agriculture 	 Integrating healthy agriculture in local development plan Policy targeting the reduction in pesticide uses and promotion of healthy agriculture
2. Pressure	 Strict control of pesticide marketing Supporting IPM and other alternative farming techniques and practices 	- Better control of pesticide distribution and handling practices - Introduction of IPM and other alternative farming practices
3. State	 Strengthening environmental surveillance with better focus on pesticide contamination Enforcing the rules in safe pesticide handling 	 Developing tools for local surveillance system Educating for better pesticide handling systems and practices Better knowledge in pesticide uses
4. Exposure	- Supporting the development of self-assessment learning tools - Promoting safe practices in pesticide uses	- Developing or implementing self-assessment learning tool for assessing farmers' exposure - Developing local indicators to reduce environmental exposures - Promoting safe practices in pesticide uses and handling systems
5. Effect	- Improving medical capacity and health record system	- Improving primary care capacity and local health record in dealing with pesticide effects

However, it is important to emphasize that if the impact analysis under the DPSEEA Model is limited to specific 'cause and effect' analysis and consider only the driving forces that directly link to the health risks and health hazards, it will become a tight perspective model.

2.3 Dimensions of health impacts

In order to expand our understanding on potential health impacts, it is important to consider the dimensions of health impacts (see table 2.8). This is because some important issues are often neglected in practice during HIA, for example impacts that are indirect, irreversible, and cumulative. Moreover, the distribution of impact has becoming more important and should be considered in any impact assessment.

The analysis of all dimensions will lead to a more comprehensive understanding of various aspects of health impact, and this in turn will help to minimize negative impacts and maximize positive impacts. The details of these dimensions are as the following.

Positive Impacts vs. Negative impacts

When we analyze potential health impacts of any project, program, or policy we need to consider its impacts thoughtfully, and look at both negative and positive impacts. However, usually Health Impact Assessments focus on negative health impacts, while positive impacts are neglected. This limits the effectiveness of HIA in changing decisions as decision-makers usually want a balanced assessment that includes what is being done well, not only what is being done badly. Understanding of both positive and negative issues will lead to better deliberation for comprehensive solutions and therefore assists decision-makers to reach reasonable and balanced decisions on project, program or policy development.

Direct Impacts vs. Indirect impacts

It is also important to consider potential health impacts both in term of direct and indirect impacts. Normally the appraisal of health impacts is more focused on direct impacts rather than indirect impacts. Direct impacts are resulted from carrying out the project, program or policy directly, so they are easily observed and easy to monitor. However, indirect impacts are difficult to clearly identify, as they are consequences of the changes of socio-economic and environmental factors that may affect human well-being. Understanding of both direct and indirect impacts will help us to consider potential health impacts carefully, particularly the often unexpected outcomes of indirect impacts. At the same time, considering both means that more comprehensive solutions will be offered and discussed.

Acute Impacts vs. Cumulative and Long term Impacts

Some health impacts can be immediately observed and their effects are obvious. These are termed acute impacts. Since acute impacts are almost always taken into account when analyzing health impact, most the mitigation measures tend to concentrate only on acute impacts. However some impacts are cumulative (a series of smaller impacts that collectively add to a large impact) and may take a long time to occur. Cumulative impacts may cause adverse effects or severe problems in the future and it may be expensive or too late to deal with them when they arise. Examples of cumulative impacts include cancer, collapsing of the ecosystem, and climate change. A full HIA requires careful consideration of both acute and cumulative impacts.

Reversible Impacts vs. Irreversible Impacts

Another dimension of health impacts that is usually neglected is the issue of reversible or irreversible impacts. Some impacts can be resolved with mitigation measures or can be recovered after solving the problem, while some impacts remain irreversible a long time after the HIA. Therefore, these kinds of impacts should receive special attention and high priority in the assessment.

Many health impacts are irreversible and are therefore important to consider in HIA. For example, building a nuclear power plant imposes high risks to society. If the power plant is accidentally damaged and exploded, the adverse impacts on the environment and people's health cannot be reversed, recovered or compensated.

Uncertainty

Current society is complex and complicated. Some important factors affecting our daily life are uncontrollable, particularly those that occur at transnational levels, e.g. oil price, climate change, new communicable diseases, etc.

It is impossible to understand every single issue and know all impacts that may happen in the future. Therefore the issue about uncertainty of impacts should be carefully taken into consideration when analyzing potential health impacts, particularly long-term or accumulated impacts.

Examples of such uncertainty are pesticide uses and the risks of cancer, the Persistent Organic Pollutants (POPs) and the change of the ecosystem, etc.

Distribution of impacts

Usually, the analysis of potential health impacts tends to consider only the amount or the significance of impacts, without any attention to the distribution of these impacts. Distribution of impacts is critical if HIA and Healthy Public Policy are to better understand equity implications (that some groups may be differentially affected in comparison to other groups, and that this difference is unfair and is able to be altered by decision-makers). For example, there are development projects that have positive net benefit overall if distribution is not taken into account. However, in reality, the benefits mainly go to rich groups, while the negative impacts are born by poor and marginalized groups. Examples where this inequitable distribution often occurs are mining, industrial estate, and large dam.

As a result it is vital to take into account different groups. For example those who may be vulnerable groups, other groups that may benefit more than others, and other groups that may be more affected than others.

The following table is shown some examples of dimension of health impacts

Table 2.8 Examples of Dimensions of health impacts

Positive Impacts Economic growth, income generation, employment, revenue/taxes, improve quality of life	Negative impacts Health hazards, health risks, mental health problems, damage, irritants, conflicts, and poor quality of life.
Direct impacts Pollution, health hazards, damage, injury, accident	Indirect impacts Mental health problems, social conflicts, environmental degradation, loss of biodiversity
Acute Impacts Bad odors from chemical uses, headache or skin rash from pesticide exposure, water shortage	Cumulative Impacts Chronic disease such as cancer, loss of biodiversity, collapsing of ecosystem, climate change

Decreasing of income, reducing of economic growth, damage to infrastructures

Irreversible Impacts

Effects on child development, chronic disease, collapse of ecosystem, extinction of species and loss of biodiversity

Uncertainty

e.g. pesticide uses and the risks of cancer, the Persistent Organic Pollutants (POPs) and the change of the ecosystem, climate change

Distribution of impacts

- the groups who gain benefits
- the affected groups or vulnerable groups

A Summary of Key Points

- Health can be understood as 'absence of disease'- tight perspective approach or 'human well-being'- broad perspective approach.
- Understanding of health paradigms and different perspectives of health impacts is very crucial for determining different approaches to design HIA process.
- Determinants of health are factors which influence health conditions and determine health differentials or health inequalities.
- There are three approaches to understand health determinants which are:

Tight perspective approach

■ Health risk model – factors that are directly harmful to human health and can cause to disease, infirmity of disability.

Broad perspective approach

- Comprehensive standard factors or conditions that influence or determine human well-being e.g. the Merseyside model, the Canadian model, the Dahlgren and Whitehead's model.
- Local based-approach complex set of factors or conditions that influence or determine community well-being.
- There are three approaches to understand health impacts
 - Tight perspective approach needs to clarify causal relation between hazard, risk and health effect. Disciplines for analyzing health impacts are based on risk assessment, epidemiology, and toxicology.
 - Broad perspective approach emphasis on dynamic association of various factors and effects rather than causal relation. Multi disciplinary, such as psychology, sociology and anthropology, is required to understand the relationship and complexity of factors.
 - Connection between tight and broad perspective approach The tight and broad perspectives are not opposed to each other, and can be seen as complementary. DPSEEA model, developed by WHO, can be applied as the connection between tight and broad perspective.
- When analyzing potential health impacts, it is important to consider dimensions of health impacts which are:
 - positive impacts vs. negative impacts;
 - direct impacts vs. indirect impacts;
 - acute impact vs. cumulative impacts;
 - reversible impacts vs. irreversible impacts;
 - uncertainty; and
 - distribution of impacts

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PART III Analyzing Policy Alternatives

PART III Analyzing Policy Alternatives

Health Impact Assessment is a good tool in providing information on impacts. However, HIA should not only be used to show what the impacts of a project or policy proposal are. But the impacts of different policy options should also be analyzed and assessed in order to come up with sound solutions and sensible policy suggestions. This part will concentrate on the analysis of policy alternatives and the formulation of policy options as the important part of conducting HIA.

This part covers the following issues:

- Levels of policy alternative
- Dimensions of policy alternatives
- From policy alternatives to the policy options

HIA studies often put a lot of effort to 'prove' health impacts and their significance. When it comes to solutions and policy suggestions, however, often HIAs do not include analysis of policy alternatives in their analytical framework, and therefore these are not analyzed or assessed in the HIA, limiting the HIAs effectiveness in assisting or influencing the decision-making process.

The experience of HIA in Thailand has resulted in the realization that the analysis and measurement of impacts alone is often not enough to lead to healthier options. HIA should assess the health impacts of various alternatives. This will enable HIA to identify and justify healthier options. Consequently, analyzing policy alternatives is also required for HIA.

However, different stakeholders think differently about alternatives. They normally have differences in scope of thinking about alternatives, and therefore propose different types and levels of alternatives.

Therefore, the first part of analyzing alternatives is the understanding on different levels of policy alternatives. These are divided into six types, from end-of-pipe alternatives to address the symptoms of problems to area and size alternatives. The other three levels are technology alternatives, institutional alternatives, as well as goal alternatives, in order to provide the comprehensive framework of considering policy alternatives.

Following this, three dimensions of policy alternatives will be explained and discussed. Firstly, the clear understanding on the goal as well as the unit of analysis of different alternatives is crucial for the analysis. Next is the potential of each alternative that should be thoroughly examined in five aspects, which are natural resources and ecosystem,

knowledge and expertise, economic and financial, organizational and institutional, and policy and political aspect.

Following the consideration of goal, unit of analysis, and potentials of alternatives, the last topic addresses the necessity to go from various policy alternatives to formulate the sensible policy options, to be used for assessing health impacts in the HIA.

3.1 Levels of policy alternative

3.1.1 End of pipe alternative

The first level is the alternatives for immediate problem solving or detailing improvements. These may include introducing or adding more mitigation measures for environmental or social impacts e.g. air pollution control, wastewater treatment system, waste management, etc. Also, other alternatives can be adjusting the procedure, improving the production line, and good practices of the workers or farmers, in order to minimize negative or maximize positive impacts.

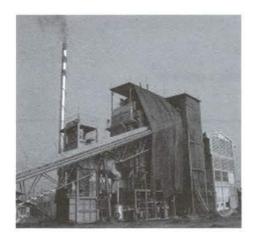




Figure 3.1 Some Examples of the End of Pipe Alternatives

Furthermore, other supplementary measures may be proposed as 'alternatives' to improve the policy or project as well. These are mainly environmental monitoring system and impact compensation fund.

This level may be called 'End of Pipe' alternative because it tends to address the *symptom* that is the end result of the problems or impacts rather than the causes of the problems. This means that this level of policy alternative does not change the key characteristics of the policy or project, but more as supplementing or modification measures.

Table 3.1	Examples	of the	End-of Pipe	Alternatives
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Issues	End-of-Pipe Alternatives	
Industrial and Energy policy	Dust precipitator, Flue Gas Desulphurization unit, Higher stack or longer pipe for diluting pollution, Wastewater treatment, Environmental monitoring system, Health surveillance system, Impact compensation fund	
Agricultural pesticide policy	Recommendations for safe use, Well protection for the farmer, The waiting period for safe harvesting	
Flooding	Sand bags, Water pumps, Flood protection wall or dam, Warning system	
Road transportation policy	Build more roads, cross-over bridges, express ways, Speed management, Car Pool	
Poverty policy	Money lending to poor people, Debt waiving, More social aid programs	
Health policy	More hospitals and clinics, More medicine, More health care services	

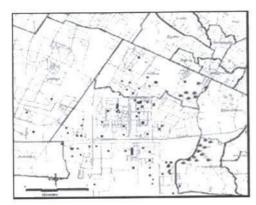
The effectiveness of End of Pipe alternatives depend on the types of impact. Some impacts and problems can be prevented by End of Pipe alternatives, and thus they are necessary and useful.

But often many other impacts have to be addressed effectively at their cause, for example, greenhouse gas emission and climate change, contamination of pesticide or other chemical substances in the environment. As a result, End of Pipe alternatives cannot address these kinds of impact.

In addition an effective (often long-term) monitoring system is required to ensure the continuous operation of mitigation or enhancement measures, in order to prevent the impacts from occurring. At the same time it is important to consider that the mitigation measures may be able to control for the potential impacts, but if there is accident or a problem with the mitigation measures themselves, impacts can still be happen. Therefore, this level of alternative can mitigate impacts, but cannot prevent the risks.

3.1.2 Area alternative

The next level of alternatives is considering various areas and sites for policy or project proposal. Since the impact and the appropriateness of a policy or project is very much dependant on the area or site. Choosing the area or placing the project in the most appropriate area will result in less impact and more benefits from the same proposal.



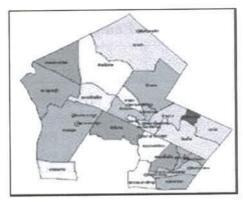


Figure 3.2 The Area Consideration in the HIA of Mab Ta Phut Industrial Estate, Rayong, Thailand

The consideration of area alternatives normally includes environmental protected area, cultural heritage, and socially important areas. There are many tools for spatial planning and area analysis, particularly mapping and Geographical Information Systems (GIS).

The existing activities and pollution must be included in the consideration of area alternatives because cumulative impacts are important issues – and are usually neglected. Consequently, some areas may need to study the 'Carrying Capacity' of the area to analyze the environmental, natural resources, and social capacities for determining sustainable development of the area.

Moreover, area alternatives can be proactively study by analyzing the natural resources and the environment, the local livelihoods and local ways of living, the economic activities, as well as the social and cultural aspect of the area, for identifying or formulating the development alternatives of the area.

Table 3.2 Examples of the Area Alternatives

Issues	Area Alternatives	
Industrial factory and power plant	Industrial zoning, Site selection for industrial estate and project, Buffer zone between the industry and community	
Mining policy	Zoning of the mining area, Permission to the forestry area, Site selection for the processing plant	
Road transportation policy	Route selection for new road, Urban planning especially the residential and commercial zones, Zoning in the city center	
Flooding	Spatial planning and water management, Site selection for dam or other water management projects	
Area Development Policy	Agriculture, Fishery, Agro-industry, Large industry, Tourism, Commercial hub	

3.1.3 Size alternative

Apart from area alternative, size of the project or the activity is another level of alternatives. The same kind of project or activity can have different size options for implementation. For example, irrigation or hydro electrical dam can have different sizes, one large dam or various small dam. Size alternatives also have direct implication for policy, since a policy can design for or set the development framework of big or small projects and activities.

Based on the conventional concept of economy of scale, policy and project development tends to favor large scale. However, big projects also tends to have more negative impacts and in wider areas. Therefore, smaller projects may provide better solutions. Although cumulative impacts can occur from the effects of a number of small projects in one area, the potential for large impacts is less and the people in the area is in the better position to monitor and control small project or activity. In addition, the differential distribution of benefits tends to be more equitable for smaller project, when compared to larger project.

Box 3.1 The Example of Size Alternatives of Rice Husk Power Plants

Many companies in Thailand are interested in developing power plant projects using rice husk as fuel. Some big projects will use about 460 tons of rice husk per day, which has to be transported from all over the province by heavy trucks everyday. This causes many concerns among the local people.

At the same time, some rice husk power plant projects are developed by the rice mills. The power plant is much smaller and will mainly use the rice husk from the mill, hence, no transportation of rice husk is needed. These projects cause less concerns to the local people about the potential impacts.

However, size has to be considered within the broader context (the surrounding social and political environment) of the policy or project. For example in some specific contexts, small projects may not be able to afford the best available technology. In contrast, in other contexts some impacts of large-scale project may not be preventable through mitigation measures. Therefore, various sizes of the project or activity should be carefully considered.

Table 3.3 Examples of the Size Alternatives

Issues Size Alternatives	
Industrial factory and power plants	Size of a factory, Size of an Industrial Estate Power Plant Complex, Large power plant, Small power plant, Community power plant
Flooding	Large dam, Small dam, Check dam Large pond, Small pond

Issues	Size Alternatives
Transportation	Size of the road, express way, skytrain, or underground train Number of routes to be built
Urban development	High-rise, Medium-rise, and Low-rise building Large department store, Discount store, Small store

It is important to emphasize that size alternative is clearly linked with area alternative. When changing to another area, it may need to adjust the project's size accordingly. Or increasing or reducing the size of a project may need to find the new area. In the other words, different sizes are needed for different sites in order to meet the constraints or to be more appropriate to the context.

3.1.4 Technology and knowledge alternative

The forth level considers different technologies and/or different knowledge alternatives, which provide different ways of achieving the same goal. So this level of alternative will provide various ways for a policy or project.

For example considering electricity generation, there are many technologies and fuels (See Figure 3.2 below) including coal, gas, hydroelectric dam, and nuclear, as well as biogas, biomass, mini-hydropower, solar, wind, and geothermal.

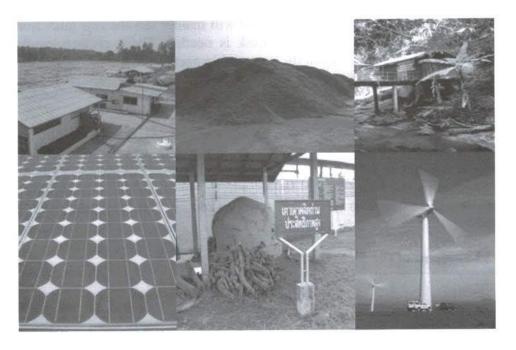


Figure 3.3 Various alternatives of renewable energy

Table 3.4 Examples of the Technology and Knowledge Alternatives

Issues	Technology and Knowledge Alternatives	
Electricity generation technologies	Coal, Natural Gas, Nuclear, Hydroelectrical dam, Biomass, Biogas, Mini hydropower, Wind, Solar, Geothermal	
Electricity saving technologies	High-efficiency light bulb, refrigerator, air-conditioning, and other electrical appliances, Insulations, Passive cooling, House design	
Agriculture practice and plant cultivation	Chemical fertilizer, Organic fertilizer, Effective Microorganisms (EM), Pesticide, Biological controls, Integrated Pest Management	
Land transportation	Bicycle, Motorcycle, Car, Bus, Truck, Train, Underground train	
Waste management	Sanitary landfill, Composting, Incineration, as well as Reuse, Recycling, and Waste minimization.	

Discussion about alternatives normally focuses on technology options. But it is important to emphasize that each technology has its own strengths and weaknesses, and its appropriateness depends on certain factors and conditions. Therefore, the 'best' technology depends very much on which aspects are considered to determine the appropriateness of different technology alternatives.

For instance, coal or natural gas power plant can generate large amount of electricity in the constant manner, but it also emits many greenhouse gases (GHGs) and coal and gas are depleted. But for wind, solar, or biogas, they can generate only small amount of electricity but emit no GHGs and they are renewable.

Therefore, technology options should be considered and assessed from various aspects. If the large and constant electricity generation for industrial sector is the priority, coal or natural gas power plant may be the most appropriate technology. But if greenhouse gas emission and natural resources sustainability are concerned, coal or gas power plant is not the best technology but renewable energy, such as wind, solar, or biogas will be the most appropriate.

However, this depends on the decision-makers and the involvement of other stakeholders for the discussion of or openness to various alternatives. This involvement reflects the importance of the next level.

3.1.5 Institutional alternative

As introduced in technology and knowledge alternatives, the institutional alternative issue is very important for the consideration and the decision-making process. Different institutions will lead to different considerations and different decisions on what alternatives should be considered, recommended, or implemented. Therefore, the difference of institutions is another level of alternative.

The term institution covers broad range of issues, thus, institutional alternatives can be view from different angles of institution. Therefore the following explanation of institutional alternatives is divided into three issues, as follows:

- 1) Organization;
- 2) Institutional structure; and
- 3) Rules and regulations.

Organization

Organization is a key component of institution. Each organization has its own interests, expertise, and resources and its interests are mainly determined by the benefit and cost structure of the organization, particularly the prior investments and other sunk costs. So each organization will consider and support a set of alternatives, and at the same time, will refuse some alternatives as well.

Thus, institutional alternatives can be different organizations or groups of organizations for formulating, considering, or implementing a policy or project. Moreover, analyzing institutional alternatives can also be identifying new organization(s) and encouraging them to take part in the process.

Box 3.2 The Example on Different Organization, Different Basis for Decision on Investing in Renewable Energy Project

In the case of the Electricity Generating Authority of Thailand, they have to compare renewable energy project with other options, for instance, coal, gas, or large dam, and also consider their expertise and other sunk costs in these conventional technologies. But for a new energy company, their interests in renewable energy do not have any sunk costs, either knowledge, equipment, or other existing projects, in any specific technologies.

Furthermore, in the case of agro industries such as rice mills or pig farms, rice husk or pig manure is the residual or waste of their production and they have to find a way to manage it anyway. Therefore, if they build power plant using rice husk or biogas from pig manure to generate electricity, the fuel is free of financial cost and the power plant investment also replaces the cost for the previous waste management. But if we compare this to community rice mills or cooperatives alternative, the investment in renewable energy project may not aim for maximum benefit as in the case of agro industries, but may also aim to strengthen the local people and being more self-sufficient in the local community.

Institutional Structure

The institutional structure also determines the role, responsibility, and relationship of each organization. The important point here is that the organization(s) who control the policy and decision making process will dominate the consideration of policy alternatives. The scope of alternatives can be narrow or broad and the aspects to consider different alternatives can be limited or more comprehensive. Thus, examining various institutional structures can lead to different institutional alternatives as well.

For example, if the structure of the power sector is dominated by the large electricity authorities and large power companies, the centralized power plant using coal, gas or nuclear is normally the favorable options. But if there are many small-scale power producers and they have some key roles in the decision-making process, the decentralized power plant using biomass or biogas will become the favorable options.

Rule and regulation

Rule and regulation is another aspect of institution that can control, support, or push one alternative or a group of alternatives over the others. Different laws and regulations, both formal and informal, can significantly affect the policy and decision-making process as well as the policy and project implementation. Analyzing institutional alternatives, in this aspect, also covers amending or canceling existing rules or regulations, setting new ones, and enforcing the related social rules and regulations.

In addition, there are two other aspects of institution, which are termed 'cognitive' and 'normative' pillars. However these are partly covered in the explanation above and they are more linked to the next level of alternatives, and hence, will be discussed more below.

It is important to note that institutional alternative is very important for the consideration of alternatives, since it can open the opportunity to include various levels alternatives or, on the contrary, it can influence the process to exclude some levels of alternatives. This is particularly crucial for the next level of alternatives.

Table 3.5 Examples of the Institutional Alternatives

Issues	Institutional Alternatives	
Decision on building a new power plant	Electricity Generating Authority of Thailand Private power company Agro-industry factory Community organization	
Structures of the Power Sector	State Monopoly structure Private Monopoly structure Power Pool Competitive structure Decentralization structure	
Decision on transportation policy	Central government Decentralization to local governments Decentralization to community organizations	
Main role and responsibility of an Impact Monitoring System	Self system of the factory Environmental authority Several authorities from environment, health, and social development Community organization and local people's monitoring	

Issues	Institutional Alternatives
	system
Decision on water allocation	National Committee Water authority
	Privatized water enterprise Community organization

3.1.6 Goal alternative

The last level of alternatives is the goal alternative. Generally, there are many goals that are important for the society, which represent various aspects of development, for example, economic growth, income distribution, pollution control, climate change, self-sufficiency, community cohesion, social integrity, etc. A policy or project may be related to many goals.

But if it is taken that any policy or project is developed to achieve a main goal or a set of main goals, the key question to ask is 'what is the main goal(s) behind developing the policy or project?'

This links to the priorities and the way of thinking of decision-makers as well as the other stakeholders in the policy and decision-making process, the 'normative' and 'cognitive' pillar, that which goals are the most important.





Table 3.6 Examples of the Goal Alternatives

Issues	Goal Alternatives	
Energy planning	Security of energy supply	
	Lowest energy cost	
	Self reliance on domestic resources	
	Create employment	
	Reduce pollution and Climate change	

Issues	Goal Alternatives				
	Create value added for agricultural residuals				
Transportation policy	Increase energy efficiency of transportation Reduce pollution and Climate change Healthy society e.g. increase exercise of the people, social cohesion				
Agricultural development	Export Food security and self sufficient Rural development and local livelihood				
Industrial development	GDP growth Value added to domestic products Local employment Sustainability of resources and Healthy environment				

However, goals often change because of changing situation and priorities of the society, the policy or project has to change or adjust or new ones are needed instead. This will open the opportunity for other alternatives. Moreover, being aware of these changes can enable new alternatives to be suggested and recommended.

The example is from the agricultural sector. During the Green Revolution in 1970s, the main goal was to produce more products for export. The agricultural policies, then, concentrated on commercial farming, chemical fertilizer, and pesticide. But due to changed situation and the economic and social problems both at the national and the community and household level, the policies now changed toward Sufficiency Economy and there are more and more cases of self-sufficient organic agriculture around the country.

Another useful example comes from the energy sector. In the past, energy planning and development have placed a priority on the security of supply to support stable economic growth. As a result large-scale projects focus on developing fossil fuels as the key option — as these are perceived to securely support stable economic growth -, and renewable energy has not been an option since its production depends on natural conditions, such as wind or sun shine — often not perceived as not secure enough to support economic growth.

But recently other socio-economic problems have become a priority of society, including increases in fuel price, investment burden of the government, and employment creation. At the same time the security of large-scale fossil fuel projects has been questioned because they have huge investment, low flexibility, high risk, and create less jobs compare to renewable energy alternatives.

These changes in the goals of energy planning and the society open up the opportunity for renewable energy alternatives.

The next table is an example of considering various alternatives for the transportation policy. It includes different levels of alternative and their effectiveness on the key impacts.

Table 3.7 Alternative Measures for Healthy Public Policy in the Transportation Sector and Their Effectiveness on the Key Impacts

Measures	Reducing crashes	Reducing air pollution	Reducing noise	Mitigating climate change	Promoting physical activity	Promoting community cohesion
1. Reduction of Road A				377		
(More focus on End-of-l	Pipe level)					
Speed management	©	☺	©	©	☺	©
Traffic calming and speed reduction in residential areas	©	☺	☺	©	©	©
Safer cars (including fronts protecting pedestrians)	©	(2)	Θ	Θ	Θ	©
Reducing the power of vehicles	☺	©	⊜	0	Θ	?
2. Mitigation of Environmental (Include Technology and)	t.		
		0.172	9		•	•
Clean fuels and more efficient vehicles	⊜	☺	⊜	☺	•	Θ.
Environmentally differentiated fees for motorized transport in urban areas	(4)	©	⊜	(9)	(4)	?
Implementing noise reduction barriers	@	(2)	©	⊜	⊜	0
3. Demand side Manag (Include Area, Institutio)			
Reducing transport demand (such as by telecommunication)	©	©	©	©	©	©
Traffic Congestion Charges or Fees for the Congestion Areas	©	©	©	©	©	©
Urban parking management	©	©	0	0	©	0
4. New Alternatives fo	r Transport	ation (Includ	le Institutiona	l and Goal Al	ternative)	
Promotion of safe cycling, walking and public transport	©	©	©	©	©	☺
Investment in safe infrastructure for cyclists and pedestrians	©	©	☺	③	©	©

^{⊕ =} positive effect ⊕ = not relevant ? =unclear effect (Adapted from Racioppi, F. et.al, 2005²)

3.2 Dimensions of policy alternatives

The six levels of alternatives discussed above can be used as the framework for identifying and considering policy alternatives. However, different stakeholders prefer and push forward different alternatives and this can lead to confusion and even conflict situation.

To facilitate the meaningful discussion of alternatives, both in the HIA as well as in the policy and decision-making process, a clear understanding of each alternative is needed to prevent the mixing and confusion of alternatives that will lead to achieve different goals or alternatives of different units. Moreover, many proposed alternatives have very low potential or hardly possible.

Therefore, three dimensions of policy alternatives that may assist in clarifying and providing a better understanding about each alternative are explained below. The three dimensions are as follows.

- 1) Goal of each alternative;
- 2) Unit of analysis of each alternative; and
- 3) Potential of each alternative.

These are not totally separated from each other, but they are link and overlap.

3.2.1 Goal of each alternative (or Alternative To Achieve What?)

Since each alternative aims for a specific goal or a set of main goals, so it is important to have the clear understanding about the main goal of each alternative. The question to ask is 'what is the goal of each alternative?' This can also be re-phrased to consider each alternative that it is the 'alternative to achieve what'?

For example, in the discussion on alternatives for power development planning, several alternatives may be push forward by various stakeholders, such as coal power plant, gas power plant, or wind power. Even though, all of these alternatives can generate electricity, but the main goal for each alternative is different.

The main goal of coal or gas power plant is to provide a big amount of stable power supply. But gas power plant emits less pollution compared to coal, so it is also the alternative to reduce air pollution from power generation. However, the price of coal is less fluctuated compared to gas price, so coal power plant is an alternative to provide stable electricity cost.

When compared to coal or gas alternatives, wind power can generate smaller amount of electricity, thus, cannot fulfill the large demand. But this alternative utilizes wind, which is a renewable source, and also does not contribute to global climate change, so it is an alternative to energy resources sustainability and to solve the climate change as well.

The clear understanding of each alternative's goal is vital because, normally, the alternative proposed by the powerful stakeholder will be the priority in the decision-making process, even though it may produce smaller benefits than the other alternatives regarding to the other goals of the society.

From the previous example, the government or the electricity authority normally support the alternative of coal or gas power plant, and these alternatives will have higher priority in the policy and decision-making process, compared to wind power or other alternatives. Therefore, the understanding of the goal of each alternative will contribute to the more meaningful consideration and deliberation of alternatives in the HIA process.

Another example comes from agricultural sector. Agricultural authorities may support the alternative of commercial farming mainly because of the highest productivity goal. At the same time, agricultural business may also supports the same alternative of commercial farming, but mainly because of the maximize profit goal for their business. But some community organizations and farmers may support the alternative of organic farming, not because of the highest productivity goal, but because of the self-sufficiency goal as well as the good environment and health goal.

3.2.2 Unit of Analysis of each alternative (Alternative of What?)

Another important dimension is the unit of analysis of each alternative. Very often, alternatives to the same issue or the same goal are different as they relate to different units of analysis. The various units of analysis for policy alternatives can be project, program, plan, and policy; or community, province, country, region, and global; or etc.

Different units of analysis are regularly mixed up and confused in the discussion of alternatives as well as in the policy process. Hence, the question to ask is 'what is the unit of analysis of each alternative?' In the other words, each alternative is the 'alternative of what'?

Table 3.8 Examples of Different Units of Analysis of Alternatives

Issues	Examples of different units of analysis
Electricity generation	Alternatives of policy: coal, gas, nuclear, large hydropower, or renewable energy or demand side management
	Alternatives of plan: short, medium, or long term planning, how much demand side management, renewable energy, coal, gas, or others will be implemented, area consideration and spatial planning
	Alternatives of project: site and size selection
	Alternatives of project details: numerous impact mitigation measures, machines and equipments
Water management	Alternatives of community: Local weir, Check dam, Local pond
	Alternatives of province or watershed: Small dam or reservoir, Large dam, Large pond, Water demand management, Restrictions of water-intensive cropping
	Alternatives of country: Series of large dams, Water diverting between watersheds, Agricultural

Examples of different units of analysis			
policy on water-intensive cropping Alternatives of region: Large dams on the international river, Water diverting across			

3.2.3 Potential of each alternative

Considering the potential of each alternative is very important. Some alternatives are very good choices in theory, but may not be feasible in the real world conditions. So, to a large extent, the importance or significance of each alternative will be determined by its potential. At the same time, examining the potential of the preferred alternatives in detail will identify issues for improvement in order to push forward the alternatives in the policy process.

To encourage thorough consideration, the potential of alternative can be analyzed from five aspects, which are listed as follow.

- 1) The Natural resources and the Ecosystem Aspect;
- 2) Knowledge and Expertise Aspect;
- 3) Financial and Economic Aspect;
- 4) Organizational and Institutional Aspect; and
- 5) Policy and Political Aspect.

1) The Natural resources and the Ecosystem

The potential in this aspect can be considered through the availability of resources such as land, water, etc. If an alternative needs a lot of resources, for instance, a big piece of land or will use a lot of water, but it may has low potential because water scarcity and land limitation are more common problems in the present.

Furthermore, the consideration should include the pollution level and other environmental problems in the area, as well as taking the other planned or under-construction development projects or activities into consideration. The alternatives, which will contribute to more pollution or other problems, will have less or no potential.

In addition, the potential should also be considered for the overall picture of the ecosystem, particularly the sensitive areas e.g. natural forest, wetland, wildlife sanctuary, as well as cultural heritage. Some alternatives may pose so many burdens that the ecosystem cannot sustain these.

For example, many large dams have severely changed the ecosystem of the river and cause many impacts to the forest, wildlife, fishery resources, as well as the local communities. This shows that large dam alternatives in many areas are not possible in terms of their surrounding ecosystem.





Also the risks associated with each alternative on natural resources and the ecosystem must be taken into consideration. These may include the effects on the land environment, flora, fauna, aquatic, and on biodiversity.

2) The Knowledge and Expertise

To develop and implement the alternatives, both knowledge and expertise is required. For some alternatives, there may not exist enough knowledge concerning development or application. For some others, knowledge may exist but may not be available. Furthermore, knowledge may be exist and available, but there is no expertise for implementation. Thus, the alternatives in these cases have no or low potential.

Moreover, the potential of knowledge and expertise has to be considered with context. Knowledge and expertise normally has to be applied or adjusted to the local context, where indigenous knowledge and local expertise may be the key to identify appropriate knowledge and application.

3) The Economic and Financial Aspect

Financial and economic feasibility is important for realizing any alternatives. The economic aspect, in principle, is concerned with determining the worthiness of each alternative. Economics tries to maximize benefits, minimize cots, and making clear the net benefit is crucial for showing the potential of the alternative.

Regarding the financial aspect, this mainly concerns the source of budget and support of each alternative as well as investment, income, and expense,.

Some alternatives may be economically feasible, but financial unfeasible, for example biogas, solar hot water, and several energy saving measures have high rate of return, but still not so wide spread utilization due to the obstacles in other aspects. On the contrary, some alternatives may be financially feasible but economically unfeasible, such as landfill or lignite power plant, mainly due to their environmental and social costs..

4) The Organizational and Institutional Aspect

Any alternatives need to have actors, who are groups or organizations that take responsibility for the alternative, particularly for its implementation. As a result, if there are organizations ready for the development or implementation, the alternative is highly possible.

In addition, alternatives often need basic infrastructure and social services, such as water and energy supply, waste management, as well as health care services. In many cases, there are clearly not enough that exist or may exist for some alternatives, as seen in some cases of large industrial, mining, or power plant development and implementation.

Therefore, some alternatives may not be possible in term of social services, or they may need considerable improvements to increase their possibility.

At the institutional level, the structure, rules, and regulations are crucial whether they support or hinder the alternatives and the related actors. Moreover, institutions also include values and norms of a society. Some alternatives may be highly questionable in the society, and therefore, have low potential from the institutional aspect, such as nuclear power and Genetically Modified Organisms (GMOs). Other seemingly desirable alternatives may need societal values and norms to support the possibility of them occurring.

Box 3.3 Example on the Institutional Aspect of Wind Power Investment in Thailand

Even though potential to use the wind for power is clear in many areas, and the cost of wind power is already competitive when compared to other energy options, there have been only a few organizations trying to develop wind power in Thailand. One main reason is that wind turbine is capital-intensive and needs high investment at its initial stages. However, after that the fuel for power generation is free and the operation and maintenance cost is very low.

So the return on investment depends on the price and unit sale to the system. However the rules and regulations are not so clear on this issue, and may have to be negotiated with the electricity authorities, who have the monopoly power in the present structure. As a result the wind power business is still considered risky or not feasible, particularly by many private companies.

5) The Policy and Political Aspect

The last aspect for considering the potential of each alternative is policy and political aspect. Firstly, proposing alternatives in the form of policy proposal should have higher potential in the policy process than proposing them as ideas or general suggestions. Furthermore, the quality of the policy proposal, for example it is clear and covers all important issues, will determine its potential in the policy process.

The next issue is concerning policy measure. Alternatives with concrete policy measure(s) should have higher potential than the ones that do not include any policy measures.

An example is the experience of renewable energy development in Thailand. Previously, the alternatives of renewable energy were proposed with its benefits and feasibilities, but an important challenge now for further development is to analyze and advocate for the policy measures, such as feed-in tariff, investment subsidy, regulations and standards for selling electricity, etc.

Lastly, the decision on alternatives, policy proposals, and policy measures will mainly depend on the supports and obstacles in the political process. The key factors in the political process include policy actors and policy network, policy framing and rationality, as well as timing and fitting with the policy window of opportunity. These factors will determine the potential of each alternative in the political arena and they will be explained in details in the next Part on Analyzing Policy Processes.

3.3 From Policy Alternatives to the Policy Options

Generally, there are many alternatives for a policy or a project. After analyzing the three dimensions of alternatives, the diverse alternatives should be synthesized in term of the policy goals, the units of analysis, and their potential and limitations.

This is because discussing so many alternatives in the HIA as well as in the policy and decision-making process may cause problems to the stakeholders and the public and may not lead to the useful process and results.

Therefore, synthesizing the alternatives is crucial and the output is the policy options that may comprise of, or even elaborate from, one or several alternatives. The policy options normally represent the key policy directions of the specific policy issue in focus.

Synthesizing or developing the policy options is also very useful for HIA in order to assess and compare both positive and negative, health impacts of each policy option, as well as to communicate the results to the public.

Consequently, the number of policy options should be carefully considered in order to lead to constructive alternative discussion and policy process. Even though, there is no specific principle for the number of the policy option, but the suggestion here is not more than five, if they are to be constructive, as ten or twenty options may be too many and too diverse.

3.3.1 The Three Policy Options of the Power Development Plan in Thailand

The first example is the three policy options for the Power Development Plan in Thailand. Based on the broad consideration of different energy alternatives and the conditions in the policy process, the Strategic HIA of Alternative Power Development Plan (PDP) developed three options of PDP for impact assessment.

The first option was the existing formal plan of the government, which will mainly rely on natural gas for the next 12 years. However, the Electricity Generating Authority of Thailand warns that relying too much on gas is too risky for security of supply, and proposes that it is necessary to use more coal for power generation. Thus, the second PDP option focusing on coal is developed to represent this policy direction.

The third PDP option comprised of various alternatives. These are adjusting the long-term demand forecast, energy efficiency measures, different renewable energy sources, cogeneration system, and re-powering the old power plants. The chosen composition has to follow the conditions in power planning as well as showing the technical feasibility for the overall power system.

3.3.2 The 'Three Reductions, Three Gains' Policy Option in Vietnam

Another example of developing the policy option is an agricultural policy in Vietnam³. Since there were many problems and also alternatives for rice cultivation, the agricultural authority implemented the policy development process, comprising of problems identification and validation, field surveys and trials, and farmer participatory research.

Based on the results, they put together and packaged the important alternatives to be 'Three Reductions, Three Gains' for the farmers. The three reductions cover seed, fertilizer, and insecticide and pesticide, while the three gains are higher yield, better grain quality, and more income.

The policy was formally launched in 2003. In 2004, the Minister of Agriculture announced that all provincial authorities of the whole country will implement the policy. In 2006, 1,110,717 farmers participated in the policy.

A Summary of Key Points

- HIA must go beyond proving the health impacts and their significance to include the analyzing of solutions in order to better influence the policy and decision-making process.
- Analyzing Policy Alternatives is the key step to include the analysis of solutions and policy recommendations in the HIA.
- There are six levels of policy alternatives, which are End of Pipe, Area, Size, Technology and Knowledge, Institutional, and Goal alternative.
- From these policy alternatives, the clear understanding of each alternative is important to prevent confusion and to lead to useful discussion on different alternatives.
- The goal as well as the unit of analysis of each policy alternative are the first two dimensions to provide the clear understanding of each alternative.
- ❖ The third dimension is the potential of each policy alternative, which can be considered from five aspects the Natural Resources and the Ecosystem aspect; the Knowledge and Expertise aspect; the Economic and Financial aspect; the Organizational and Institutional aspect; and lastly, the Policy and Political aspect.
- ❖ Based on the clear understanding of the policy alternatives, the proper number of Policy Options should be developed by synthesizing the important alternatives, to be used for discussing as well as assessing the health impacts of each Policy Option in the HIA process.

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PART IV Analyzing Policy Processes

PART IV Analyzing Policy Processes

The purpose of this part is to equip the readers with essential knowledge of public policy process analysis by providing some useful frameworks which are applicable to the use of Health Impact Assessment for healthy public policy. For HIA to be most effective, it is necessary that the persons involved in the application of its be aware of the related policy contexts which may play the roles in supporting or obstructing the move towards the goal(s)

This part covers the following issues:

- Theoretical framework for policy analysis
- Policy analytical framework for HIA
- Policy conditions and policy analysis

Applying Health Impact Assessment to promote healthy public policy is less effective without a clear understanding of the processes involved in public policy. In the real world, public policy processes are multi-faceted and unpredictable. Without insights into the public policy process HIA cannot lead to satisfactory policy outcomes, as evidenced by the experience of some HIAs in Thailand Therefore, capacity building of HIA researchers to better understand and analyze public policy processes is crucial for the effectiveness of HIA and healthy public policy development.

One of the ways to overcome this issue is to develop an appropriate framework for public policy analysis, together with learning activities for capacity building. A comprehensive policy analysis framework is being developed for HIA practitioners, and is discussed in detail this section.

To gain more insightful understanding, the development of this framework is based on a deep exploration of relevant theories and concepts, combined with reflections from actual practice and valuable contributions from policy scientists. Additional practical insights and responses are based on capacity building activities that have been conducted in parallel in order to the development of the framework. The outcome of this study is expected to be a comprehensive analytical framework, which can be used as practical guidelines for HIA researchers. This will be subject to be further reflection and re-conceptualization based on lessons learnt from actual practice in the future.

4.1 Theoretical Framework for Policy Analysis

From several theoretical perspectives, the HPP-HIA program has identified three main models of policy analysis. These are presented in Figure 4.1 and described below.

4.1.1 Linear Model

The linear model is a policy analysis model that is based on an assumption of full rationality within the decision-making process. This perspective was developed during the 1950s and 1960s based on the development and expansion of bureaucratic structures during the modernization era. This model suggests that decisions by any organization, including government policy-making, should be made rationally¹. The policy analysis in this model, therefore, concentrates on how to develop principles, guidelines, and tools, for securing efficient and rational decisions and implementation.

The policy process in this model is usually perceived as a staged or step-by-step approach. Each stage has its own rules in guiding how rationalized decisions should be made. These stages and their principle criteria are usually underpinned by laws, regulations, as well as professional and bureaucratic codes of practice. Moreover, various decision support tools have been developed for the model, for example cost-Benefit Analysis (CBA), cost-effectiveness, and environmental impact assessment (EIA) in order to ensure the rationalization in decision-making process. This linear model has dominated the policy-making process in several countries up to now.

On one hand, the linear model seems to provide the strongest link between scientific knowledge and decision-making processes. It also appears to be accountable, with a clear set of principles and rules underpinning each stage of decision-making. As a result it is believed by some that this linear model will provide the best available and most scientifically robust options, given the current societal orientation that privileges science and rationalism.

On the other hand however, following the linear policy model inevitably implies that experts receive a privileged role in decision-making process. Also, in practice, rationalization has usually been applied as goal oriented decision-making. However in reality policy debates and analyses are not only about how to achieve a goal more efficiently but are also about the goal itself. As a result, discussion about the societal goal(s) cannot pragmatically be framed in linear rationalized model, since it (or they) depends very much on societal values rather than scientific rationality.

More importantly, the actual decision-making process does not seem to fit with the assumptions in the linear model². In the political world, answers (i.e. policy decision) usually come much earlier than questions (i.e., the problem situations). In various cases, the policy-makers only wait for the situations to be occurred. Therefore, there is no place for full rationalization to take place. When the answer comes first, shortcuts in the formal decision-making process may become usual practice. In several cases, to reach this predetermined answer, various decision support tools may be misused or badly applied.

In other words, the linear model seems to work only in the academic or ideal world. "In other words, the linear model seems to work only in the academic or ideal world. This is because: It cannot provide the rules for decision-making where knowledge and evidence

are lacking; it does not satisfactorily serve the need for meaningful public participation; and it cannot explain decision-making in the real world, when power is always behind what appears to be rationality (and sometimes this is not noticed, even by those being rational)"³.

However, understanding the stages and procedure of decision-making is still useful for HIA researchers, because, these are what governments will follow or at least refer to. Analyzing the linear model can lead to better understanding in terms of the conditions, timings, and rationality that surround the government's decision processes. Understanding these can provide entry-points at which HIA recommendations may fit more meaningfully into the decision-making process.

4.1.2 Negotiation Model

The acknowledged unrealistic assumption of the linear model has led to policy analysts searching for more practically and pragmatically oriented frameworks. The second approach, the negotiation model, focuses on policy as courses of action within ongoing processes of negotiation and bargaining between multiple actors over time. Famously described by Lindblom, the policy process in this approach is recognized as "the science of muddling through" rather than well-defined rationalized process⁴.

The negotiation model can expand the scope of policy analysis to cover issues of policy networks, policy windows, policy entrepreneurs, and policy-oriented learning. Within the negotiation model, there are two main analytical frameworks, which can differently applied to healthy public policy in Thailand; namely Multiple Stream Theory and Advocacy Coalition Framework.

a) Multiple Streams Framework:

The multiple streams framework was developed by John Kingdon (1984)⁵. The framework views the policy process as the composition of three streams of actors and processes: a problem stream consisting of information about various problems and the proponents of various problem definitions and significance; a policy stream involving the proponents of solution to policy problems; and a political stream consisting of politicians and elected officials. In Kingdon's view, the streams normally operate independently of each other and do not lead to any significant changes, except when a "window of opportunity" permits policy entrepreneurs to couple various streams. If the entrepreneur's attempt is successful, the result is major policy change. However, normally the policy window is opened and closed very rapidly, therefore, timing and the policy entrepreneurs' strategy are certainly crucial for policy changes to occur.

The multiple streams framework provides very useful insights for policy analysis. Unlike the linear model, the multiple streams framework has recognized and been developed in response to the understanding full rationalization cannot be applied (which, as shown above is the normal situation in the political world). There are a number of critical components to using the framework:

- 1. Understanding timing issues in policy process
- 2. Identifying the three policy streams in the framework along with policy windows can help with understanding why policy changes happen in some cases and do not reach in other case. In practice, some policy changes do not occur because of the forces from the

problem stream, but mainly because of the initiatives in policy streams (for example arriving at the answer before defining the problem).

- 3. In some cases, the policy and political streams are waiting for the problem to highlight its significance. Therefore, the three policy streams can be used as both analytical and operational frameworks.
- 4. The focus on policy entrepreneurs is also very important to better understand the roles of change agents in policy arena.
- 5. Last, based on this framework, the success in policy advocacy depended on chances as much as on skill and capacity.

However, the multiple streams framework is not without problems. It seems to focus on the policy process as each decision-making shot within overall policy dynamics, which consequently make policy works become tactical rather than strategic. It also omits long-term changes and influences in policy making including historical influences within a policy arena. Last, the independence of three streams may not be true in many cases, especially when there is a strong relationship between different actors operating in different streams⁶.

b) The Advocacy Coalition Framework:

The advocacy coalition framework was developed by Sabatier and Jenkins-Smith⁷. Unlike the multiple streams, this framework views policy change as a process of changing ways towards thinking in the longer term. Thus, this framework focuses on the interaction of advocacy coalitions - which consist of actors from a variety of institutions who share a set of policy beliefs – within a policy subsystem. Policy change is a function of competition coupled with policy-oriented learning within a subsystem and events and conditions outsides the subsystem. The framework spends a lot of time mapping the belief systems of policy networks and analyzing the conditions under which policy-oriented learning across coalitions can occur.

The advocacy coalition framework asserts the importance of policy networks as one of the main mechanisms for policy change. In more complex policy subsystems, individual policy entrepreneurs are rarely successful. Co-operation and co-ordination among different actors as a process of sharing capacities, expertise and opportunities is necessary for policy to be successful in the longer term. In this way, a powerful policy network can effectively push policy toward directions they wish, while blocking the efforts and restricting the policy windows of other networks. Also, focusing on policy-oriented learning within and across policy networks can provide other ways of changing policy from being merely tactical, to those with a better chance of mutual understanding. Therefore, analyzing the relationship within and between policy networks can provide useful insights for policy analysis, particularly at a more structural level and longer-term perspective. However, the advocacy coalition framework does not provide a clear operational framework when compared to the multiple streams framework.

4.1.3 Deliberative Model

Although the negotiation model provides more practical insights about actual policy processes, this may not lead to better social understanding. This is because the negotiation model is aimed at final policy outcomes rather than mutual understanding of different

policy beliefs. However, in various cases, forcing thinking only toward desirable outcomes may lead to tension, conflict and mistrust. Therefore, unlike conventional theories, deliberative policy analysis, developed during the 1990s, draws its assumptions on contemporary situations, based on democratic systems developed through dispersed power, diminishing trust, ambiguous institutions, profound uncertainty and inequality, powerful transnational influences and active but highly differentiated citizens⁸.

The deliberative policy model assumes "the preexistence of individuals engaged with others in a diverse, fluid, and overlapping "discourse community", each with its own meaning systems and hence, knowledge forms and ways of reasoning and valuing". In other words, it presupposes that we live in a social world with associated possibilities of "multiple interpretations". Therefore, it is quite important not only to raise the question of benefits and impacts of policy, but also the different meanings of policy for different actors ¹⁰.

The central question for deliberative policy analysts is "how is the policy issue framed by various parties to the debate?" Frames, just like a picture frame, "direct attention toward some elements while simultaneously diverting attention from other elements". Policy frames are often express through language and consist of a complex interrelationship among language, cognition (or perception), and action. According to Yanow, "frame conflict occurs not only because different interpretative communities focus cognitively and rationally on different elements of a policy issue, but because they value different elements differently" 11.

In this aspect, "interpretative modes of policy analysis seek to identify both the specific meanings, intended and made, of specific policies, and how those meanings are communicated and variously interpreted" ¹². In other words, deliberative policy analysis should "be able to understand the complex ways in which meaning is hidden in policymaking discourse and thus be able to anticipate political controversies" ¹³.

Although the deliberative policy analysis must necessarily include empirical investigation, it also needs to situate this 'in a larger set of normative concerns that give its findings meaning' 14. This is because "the structure of a policy argument is typically a complex blend of factual statements, interpretations, opinion and evaluation" 15. Hence, the task of deliberative analysis is to understand "a matter of establishing interconnections among the empirical data, normative assumptions (that structure our understanding of the social world), the interpretative judgments involved in the data collection process, the particular circumstances of situational context (in which the finding are generated and/or to which the conclusion apply), and specific conclusions" 16.

It follows that the main task of deliberative policy analysis is to understand "interactive and deliberative processes of discovering ends, recognizing other parties, marshalling the evidence and giving reasons, exploring the implications of various value positions and developing joint responsibility in concrete situations"¹⁷. Certainly, the fundamental goal of this policy analysis is to discover ways of 'living together differently but respectfully'¹⁸.

4.2 Policy Analytical Framework for HIA

Based on the three theoretical models of policy analysis and their implications for Thailand's policy environments, this manual has developed an integrated analytical framework. The framework aims to provide some guidance for HIA researchers to understand policy processes and, more importantly, to identify an effective role for HIA and HIA researchers within each specific policy process. The framework can be shown in the Figure 4.1

Our HPP-HIA analytical framework views policy-making in three main layers. The first layer is the linear or formal policy process, which contain a number of decision nodes and are governed by decision-making rules. Normally, the formal policy process is in the control of government and elected officials. However, in reality, the formal policy process does not occur in a vacuum but is located within a policy domain or policy subsystem, which in turn consists of a number of competing policy coalitions or networks. These different forces within the policy domain form the second layer. Moreover, in gaining social and political supports, each actor and policy networks always communicate with the public outside the policy domain. Therefore, analyzing the policy process has to go beyond the policy domain to see the actions that have been taken and the responses in the society as the broadest layer of policy analysis. Based on these three layers, the eight aspects of policy analysis should be carefully conducted following the discussion below.

1) Understanding Linear Policy Process

Our framework suggests HIA researchers start by analyzing formal linear decision-making in order to find the decision as and understand their conditions, procedures and timing. Doing this is useful to a) identify policy actors (at least the formal ones), b) to realize critical timing and window for policy influences and c) to clarify any rationality which will be used.

2) Understanding Policy Networks

The policy networks and the relationship of policy actors should be the first focus. Understanding this relationship is not only to identify active stakeholders, but also to understand their policy interpretations, different rationality used to base interpretations on, and how different policy framing occurs when the actors are communicating with others both in the policy domain and at a societal level. Analyzing policy networks also helps in understanding power relations both within and among the policy networks. As mentioned above, power often influences the rationality used in the policy domain and process.

3) Understanding Policy Meanings and Framing

The next step is moving to the societal level. The focus should be on how policy issues have been interpreted and framed by various groups within society, which depends on historical and cultural influences, public perception and mood, and the communicative strategies of policy networks, as discussed earlier. It is very important to note that the public may interpret and frame policy issue differently to policy professionals and politicians, as mentioned in the deliberative model. Understanding policy meanings and framing helps HIA practitioners understand how the public will analyze and interpret the

different evidence and information related to a policy issue, based on their interpreted meanings and framing.

4) Analyzing External Factors

Apart from understanding policy meaning and framing in public, at the societal level, it is also essential to analyze external forces within and outside the country. These external forces include socio-economic changes, political shocks, and natural disasters and so on. These can shape public perceptions, values and rationalization and therefore policy meanings and framing. At the same time, external factors can open a policy window and change rationality and its influence within both policy domain and policy process. However, the importance of different external factors in policy process is dependant on the public's policy framing and meaning.

5) Understanding Power Structure and Rationality

The first four steps take place 'upstream' in policy analysis. The insights from these steps, as explained earlier, are useful in identifying the relationships between power structures and rationality in each decision node and in overall decision-making processes. As a set of evidence-based policy recommendations, HIA in this respect is a kind of rationality being used in policy-making process within a specific (and dynamic) power structure. Therefore, to be an effective intervention, HIA researchers need to understand how different rationalities will be used and employed differently in policy-making processes. Understanding power structure and rationality will also define the roles and strategies of HIA within decision-making processes. Unfortunately, there is no cookbook for conducting in this step. However the integration of insights from former steps is useful, coupled with an attempt to discover the ways to act differently and meaningfully in policy-making process.

6) Understanding Timings and Policy Windows

In the real political world, the influences of different rationality in policy-making are highly depended on timing, as mentioned in the Multiple Streams Framework. In other words, understanding the policy window is a critical dimension of influencing policy. Analyzing external factors and public policy framing will help to identify suitable timing and windows of opportunity. Identifying timing and policy windows needs to fit with the timing of the decision node in the policy process.

7) Identifying Role of the HIA and the Strategy employed by the HIA

Understanding both power and rationality, and identifying timing and policy windows form two important aspects of identifying the roles and strategy of HIA contribution to the policy-making process. For example, the HIA may focus on some specific decision node within the appropriate timing. It can also be used for joint analysis between the HIA and other important aspects or goals, such as public finance or social problems (as an influential rationality or policy window in decision-making process). It may also focus on convincing some powerful organizations within the power structure to shift their frames toward health. It can also open decision-making process and rationality to the public and to ask public to show their responses. Unfortunately again there is no golden rule on what should be the best HIA strategy for each type of policy-making. Doing so requires skill, experience, judgment and creativity of our HIA practitioner.

8) Effective Communication Strategy across Three Layers

Since policy-making is a long-term social learning process, focusing too much on each decision-making may overlook the actual benefits of HIA, because through HIA process, social understanding of the policy issues may gradually improve rather than rapidly change in the first attempts. Moreover, the policy process is full of influences, power issues and uncertainties; therefore we should not expect that every HIA can always lead to desirable policy change. According to deliberative policy analysis, success may be achieved through leading to improved understanding of issues rather than actual policy changes. In this view, unsuccessful cases, in terms of present policy change, may accumulate to form pressure and therefore together create openings for desirable and more sustainable outcomes in the future. Therefore, HIA researchers should pay attention to communicating with policy actors and the public as well as convincing policy-makers. In doing so, HIA researcher needs an influential communicative strategy, based on insights gained from the previous steps, particularly the policy framing and policy window steps.

Although Figure 4.1 organizes our HPP-HIA framework in a step-by-step manner, in practice all these steps are highly intertwined. Therefore, it is often not useful to take a step-by-step approach, but rather to focus on each area of the framework when each becomes necessary. HIA research may need to use this framework going forward and backward. In short, these three layers of analysis with their various directions shown by arrows are just broad recommendations for HIA researcher to balance and integrate inside-out and outside-in viewpoints through the interconnections of important elements within policy-making process.

4.3 Policy Conditions and Policy Analysis

In the real political world, policy-making is not always about apparently formal decision-making process. Based on Lukes, the exercise of power can be seen in three dimensions; decision-making power, agenda-setting power, and thought manipulation power. Therefore, in this sense, powerful actors do not only have power to say yes or no to specific policy proposals, they also exercise power in setting up the agenda for decision-making (including the option to do nothing at all). Moreover, some powerful player may have power in controlling or manipulating public perception and consequently be able to keep some policies from public scrutiny¹⁹.

Within unequal power structures, policy-making takes the form of three main conditions. Some policies are the explicit in the decision-making process, so-called "policy in decision-making". Here the focus is more on policy-maker and decision-making power. However, in other cases, powerful players may ignore healthier solutions. This refers to a condition of "non-action policy". Other policies may have never been raised publicly before, and, perhaps, cannot be raised also within the existing power structure (which in this sense usually refers to cultural and institutional aspects of a power structure). In these cases, we usually recognize as policies in a "non-issue policy" condition.

These three policy conditions vary across societies and are dynamic; in specific social situations, they are still difficult to change, especially within the short term. For example several HIA cases in Thailand are locked into non-action policy or even in non-issue policy conditions. Searching for decision nodes or finding sound evidence does not easily help in influencing healthy public policy, because those policies are not actually placed in

decision-making agenda at all. Therefore, in these policy conditions modification of our policy analysis framework is needed to provide a more useful practical insight for the HIA researcher.

For the non-action policy, such as a policy in supporting organic farming in Thailand, there is little point starting with the existing inactive policy process (including political symbolic actions). It is better to begin with understanding policy networks and policy meanings and framing. In other words, HIA will be mainly used in stimulating policy-oriented learning within and across policy networks and in discovering the ways toward better social understanding about the policy issue. At the same time, it is also useful to analyze external factors, which may lead to shock, pressure, and opportunities for a policy window, such as EU's banning of Thai pesticide contaminated products. In the short term, searching and preparing for a policy window is a suitable strategy. In the longer terms, shifting power structures, understanding policy framing and changing rationality can be a critical foundation for future policy changes.

For the non-issue policy, such as healthy transportation system in Thailand (except prevention of car accidents), perhaps, it may not be possible to start with policy networks, since these may not exist. In this situation, the best expectation from HIA in the first step is to provide evidence which can help society to frame and give meanings to the policy issue. It may also provide a link to external factors or national dramatic events or opinions. Developing appropriate policy framing, and effective communication should be a good foundation for nurturing policy networks and expanding momentum for policy change in the longer term.

It is important to note that the Environmental HIA approach to project approval may not be faced with non-action and non-issue policy conditions, since most projects aim to be actually implemented. However, for those, who develop HIA for supporting healthy public policy development, often these unfavorable policy conditions are quite normal and require an appropriate framework for specific situations.

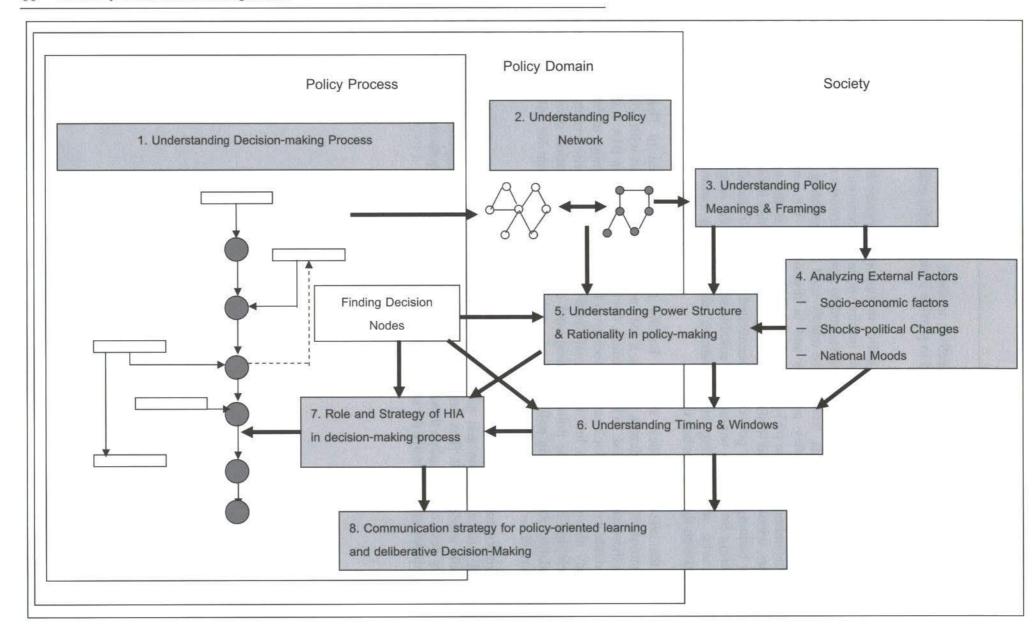


Figure 4.1 The comprehensive public policy analysis for HIA

A Summary of Key Points

- Applying HIA to promote healthy public policy is less effective without a clear understanding of the processes involved in public policy.
- Capacity building of HIA researchers to better understand and analyze public policy processes is crucial for the effectiveness of HIA and healthy public policy development.
- There are three main models for policy analysis which are:
 - 1) Linear Model;
 - 2) Negotiation Model; and
 - 3) Deliberative Model.
- Linear model is based on the assumption of full rationality in decision-making process. This model, therefore, concentrates on how to develop principles, guidelines, and tools, for securing efficient and rational decisions and implementation.
- Negotiation model focuses on policy as course of action, within ongoing processes of negotiation, bargaining between multiple actors over time. This model can expand the scope of policy analysis to cover the issues of policy network, policy window, policy entrepreneurs, and policy-oriented learning.
- Deliberative model is trying to understand "interactive and deliberative processes of discovering ends, recognizing other parties, marshalling the evidence and giving reasons, exploring the implications of various value positions and developing joint responsibility in concrete situations". Certainly, the fundamental goal of this policy analysis is to discover ways of 'living together differently but respectfully'.
- There are eight aspects for policy analysis which are:
 - 1) Understanding linear policy process;
 - 2) Understanding policy networks;
 - 3) Understanding policy meanings and framing;
 - 4) Analyzing external factors;
 - 5) Understanding power structure and rationality;
 - 6) Understanding timings and policy windows;
 - 7) Identifying HIA role and strategy; and
 - 8) Effective communication strategy across three layers.
 - "...impact assessment does not influence policy through some magic inherent in its techniques or procedure"
 - ..the success of impact assessment is the appropriateness and effectiveness in particular circumstances of its implicit policy strategy" (Bartlett RV. 1989)

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PART V Analyzing Evidence for HIA

PART V Analyzing Evidence for HIA

As mentioned in part I, HIA aims to present "a set of evidence-based recommendations" geared towards informing decision-making processes. Evidence is a very important aspect of HIA, as evidence determines the outcomes of HIA and the creditability of policy recommendations made. A series of questions are discussed here to guide consideration of essential issues related to the use of evidence within HIA processes

This part covers the f	following	issues:
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- Why do we need evidence in HIA?
- What are the special features of evidence for HIA?
- When do we use evidence?
- What types of evidence do we use?
- Where are the sources of evidence and how can we get them?
- How do we use the evidence?

5.1 What is Evidence?

Chambers dictionary refers to "evidence" as the results of "systematic investigations, aimed at increasing the sum of knowledge". The Oxford English Dictionary refers evidence to "testimony or to other information from which inferences can be drawn". These are slightly different, the first oriented towards 'systematic' approaches to evidence to inform society's knowledge, the other towards any type of evidence that informs further knowledge about the specific issue at hand.

In practice, both definitions of evidence have been applied to HIA. Normally, HIA tries to systematically collect data on the impacts of policies, programs and projects and based on this to facilitate discussion and conclusions concerning the balance between benefits to human health and harm or risk to human health.

However, the evidence in HIA usually comprises a range of way of knowing about the biological, psychological, social, economic, material, and spiritual worlds. Social history, economics, politics, anthropology, development studies, environmental sciences, epidemiology, toxicology may all make a useful contribution to the HIA process.

Obviously, each of these has its own disciplinary paradigms, arena of debates, agreed cannons, and particular epistemological positions². Therefore, differences in evidence from different disciplines or schools of thought may be involved in the HIA process.

HIA practitioners will normally find several difficulties concerning evidence within HIA. Examples of the difficulties are 1) absence of evidence; 2) biased evidence; 3) conflicting evidence; 4) misinterpreted evidence; 5) eccentric evidence; etc.

Consequently, consideration should be made about whether what we know is suitable for what we need to do within the HIA process: is the evidence appropriate for the purposes of the HIA? In fact, differences in terms of disciplines and evidence are not usually a problem if we understand the notion that "humans use different forms of knowing and different forms of knowledge for different purposes in their lives".

5.2 Why do we need evidence in HIA?

Although searching for and analyzing evidence are perhaps the most difficult processes in HIA, they are indispensable. Good quality HIA recommendations are based on good quality evidence. We need good quality evidence to answer the two key HIA questions:

- What are the potential positive and negative, direct and indirect health impacts of a proposal?
- What are better alternatives?

To better answer these two questions, we have to collect detailed evidence of the proposal, the potential health impacts as well as the alternatives. It should be noted that the alternatives recommended by the HIA may themselves contain potential health impacts. Thus, potential health impacts of both the proposal and the alternatives must be equally considered. This is why evidence for HIA process has special features.

5.3 What are the special features of evidence for HIA?

Understanding the special features of evidence enables HIA practitioners to be able to efficiently facilitate the HIA. The special features include:

- 1) a focus on the effects of complex interventions or policies on determinants or health as well as health status;
- 2) diverse sources of evidence being sought out;
- 3) evidence from stakeholders being counted equally;
- 4) time and resource limitations;
- 5) an ultimate aim of being able to better inform decision making.

Some see HIA as an applied science process rather than the pure science of searching for absolute facts of nature. This is because the pure science approach is criticized for its reductionist approach with human society and its ecology seen as highly complex and therefore unable to be assessed through a laboratory or microscope. As a result of its 'real world' focus, evidence for HIA processes is therefore as holistic in nature. At the same time, since evidence in HIA applies directly to decision making, the political nature of the use of that evidence requires understanding.

5.4 When do we use evidence in HIA?

One of the misunderstandings about HIA is that we use evidence only at the stage of assessing and appraising a proposal to analyze its potential health impacts. In reality, we use evidence at every stage of HIA processes, including: 1) screening priority proposal for HIA; 2) assessing or appraising its potential health impacts; 3) recommending actions needed for mitigating negative health impacts and enhancing positive ones; 4) making decisions; and 5) monitoring and evaluating the whole HIA process.

Generally, we need evidence to describe or forecast health status and all determinants of health of target populations in relation to proposed policy. We have to show linkages between the proposed policy and its potential impacts on health.

5.5 What Types of Evidence Do We Use?

A range of types of evidence can be used in HIA. Past experiences, present health status and determinants of health of target populations are normally collected and utilized as a basis for forecasting impacts. Detailed evidence related to the proposed policy is also crucial in assessing its potential health impacts. Types of evidence can be broadly classified as 1) quantitative; and 2) qualitative evidence. Both types of evidence should be used in HIA processes.

These two types of evidence are classified according to methods or approaches of obtaining and analyzing information. Quantitative evidence on health and determinants of health is mostly derived from *epidemiological studies and related quantitative modeling*. Qualitative evidence on health and determinants of health is mostly derived from *social science and anthropological studies*. Although both approaches have different methods, both need the same source of information: people. A detailed summary of the two approaches is outlined below.

5.5.1 Evidence from epidemiological Studies

The guidelines of epidemiological studies provided here are summarized from the books of Nick Higginbotham et al (2001) on *Health Social Science: Trans-disciplinary and complexity perspective.*

Epidemiology is 'the study of the distribution and determinants of health related states or events in specified populations and the application of this study to control health problem'⁴. The results of epidemiological investigation are useful to understand the natural history of diseases and opportunities for prevention or therapy, to estimate the demand for health services, and to evaluate effectiveness of preventive measures and treatments. The principal function of epidemiology though is to understand the causes of disease⁵. In this regard, it shares with other quantitative sciences a concern to establish causal pathways that are certain as possible.

According to Higginbotham et al (2001), Epidemiological studies may be categorized into three main levels;

 Level I: Problem Description, such as case report, case series, case studies and cross sectional survey.

- Level II: Identifying Elements in the Casual Web, such as cohort studies, case-control studies, and ecological studies.
- Level III: Clarifying Causal Links within a dynamic system such as randomized control trials

1) Case report, case series, and case studies

The simplest observational study is the case report. A case report describes a single unusual case that stands out from what is commonly observed to be true. Unlike most epidemiological study designs, the case report and case series are essentially qualitative methods-their value is dependent on the rich description of a problem in the fullest possible clinical context⁶.

A case series describes a number of cases of the same or related unusual observations. The series stands out against what is commonly understood to be normal for that particular population. Case report and case series are important means by which unusual disease or unusual patient symptoms are brought to the attention of the medical community. These studies may be our only means of surveillance for rare clinical events, may make us aware of unusual manifestations of a disease, and may serve as a trigger for larger and more decisive studies examining the mechanism of a disease process by reporting the results of highly detailed clinical and laboratory studies in a small number of patients⁷. In terms of sampling strategy, case report and case series are termed 'non-probability' (non-random) samples⁸, and are therefore diminished in their scientific robustness.

2) Cross-sectional surveys

In epidemiological research, cross-sectional surveys are most useful for answering questions about the proportion of a population experiencing a given problem at any one time (prevalence) – hence the term 'cross-sectional' as they cut across a section of the population and one point in time.

In fact, the cross-sectional study is the only study design for this purpose. Cross-sectional surveys may be administered in a face-to-face encounter between interviewer and respondent, by self-administered questionnaires, or by telephone interviews. Questions about prevalence can only be answered if you know both the numerator (the number of people affected) and the denominator (the number of people in the population)⁹.

Consequently, cross-sectional studies require the administration of a questionnaire or health examination to the entire population (a full census) or, more efficiently, a representative sample of the population. The use of a random (probability) sample allows for statistical techniques to be used to generalize from the sample data to the entire population ¹⁰.

Advantages of cross-sectional studies¹¹

- Cross-sectional studies may be uses to study several exposures and outcomes simultaneously.
- They enable control over the selection of subjects.
- They enable control over measurement.
- They are of relatively short duration.
- They are a good first step for a broader cohort study.
- They provide an estimate of prevalence.

Disadvantages of cross-sectional studies¹²

 Cross-sectional studies do not establish the sequence of events since both the outcome and the exposure occur prior to the study.

- There is a potential bias in measuring exposure (since the outcome is known at the time of the survey).
- There is a potential 'survivor bias' (since only people still living can be included in the study and since people with disease of long duration are more likely to be counted than people who recovered quickly or who have died).
- Their use is not feasible for rare conditions or exposures since large numbers of unaffected people will need to be surveyed to obtain enough case for reasonable prevalence estimates.
- They do not provide any measure of incidence.

3) Cohort studies

Cohort studies differ from cross-sectional studies in many ways. First, individuals are selected according to whether they been exposed to the study factor (exposed) or not (unexposed). The second major difference is that cohort studies measure the incidence rate rather than prevalence. Whereas prevalence is an index of the number of cases (both new and old) as a proportion of the entire population, incidence refers only to new cases. The incidence rate is the number of new cases developing among the population at risk within a specified time period¹³.

In a cohort study (also know as longitudinal, prospective, follow-up, or incidence study), exposed and unexposed groups who are initially free of disease are followed in time during which the incidence rate (risk) of the outcome is measured. The relative risk can then be calculated¹⁴.

A special type of cohort study is a historical or retrospective cohort study in which a group, such as employees in a particular industry, are enrolled from company records many years before and the outcome is measured in the present. As long as information on exposure (for example, petrol fumes, noise, radiation) is available and the people are available for follow-up, similar kinds of estimates can be made as in prospective studies without the necessity of waiting many years for the outcome¹⁵.

Advantages of cohort studies16

- Cohort studies ensure that exposure has definitely preceded the outcome.
- They allow the establishment of absolute risk (incidence)

Disadvantages of cohort studies¹⁷

- Cohort studies are inefficient, as very large numbers are required, often for an uncommon outcome.
- They are expensive because of the resources needed to follow up people over a long time.
- Their results are not available for a long time; by the time the results are available, the problem may have no relevance.
- They are usually restricted to study of exposures which are measured at the start to the study; increase in knowledge may reveal far more important exposures which were not known at the start of the study.

4) Case-control studies

The case-control study is the most efficient way of assessing association when the outcome is rare. In this study type, the researcher begins with a group of people who have the outcome (cases) and a comparable group of people who don't have the outcome (controls). The researcher then obtains information regarding past exposure to the study factor. A statistical association exists if the exposure is more common among the cases than controls. The strength of this association is calculated in terms of the odds ratio (the odds of exposure in the cases relative to the odds of exposure in the controls) and is comparable to relative risk statistic that can be calculated from a cohort study ¹⁸.

Advantages of case-control studies¹⁹

- Case-control studies are valuable for studying rare conditions.
- They are of short duration.
- They are relatively inexpensive.
- Only a relatively small number of subjects are required.
- They yield odds ratio (usually a good approximation of relative risk).

Disadvantages of case-control studies²⁰

- Case-control studies are limited to one outcome variable.
- There is a potential bias from selection of cases and controls.
- They do not establish a sequence of events.
- There is a potential bias in measuring exposure.
- There is a potential survivor bias.
- They do not yield absolute risk (incidence) estimates.

5) Ecological studies

Ecological designs are based on the comparison of two geographic areas (or other common ecologies) where one is thought to have a high degree of exposure or out-come and the other a low degree. The unit of analysis is the group rather than the individuals within the group. These two populations are then compared with respect to the incidence, or prevalence, of the outcome of interest. Ecological designs have led to interesting associations between the diets of people in China and Eastern Europe and the incidence of cancer of the oesophagus²¹. However, care has to betaken in attributing causality to such an association; just because there are associations on a population basis does not mean that the individuals who were exposes (for instance, to a particular dietary chemical) have the outcome (the disease being examined)²².

An example of ecological study in Thailand is the comparison between out-patient ratio of several diseases in Rayong Province and the regional and country average during the period of 1984-1998, in order to see the potential impacts of the expansion of industrial estates in Ma Ta Put area. One of the comparisons, concerning mental disorders, is shown in Figure 5.1

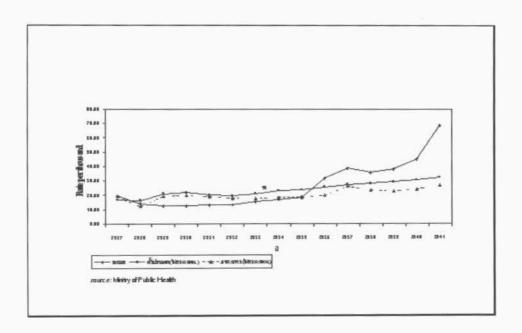


Figure 5.1 Out-patient Ratio from mental disorders, 1984 - 1998 **Source:** Sukkumnoed and Tang, 2005²³.

6) Randomized controlled trials

An investigation in which similar groups of individuals are allocated at random by the investigator to receive or not to receive a therapeutic or preventive intervention is termed a randomized controlled trial (RCT). Participants are observed for the occurrence of outcome of interest. The RCT is the mainstay of Level III investigations.

The importance of randomization is not in achieving balance between groups in term of known confounders but in evenly distributing unknown confounders. Given sufficient studies participants, all factors should be evenly distributed between the groups before the experimental intervention begins. Differences in outcomes can be reasonably judged to be the result of the intervention.

Advantages of Randomized Controlled Trials²⁴

- With randomization, comparability of groups is very likely for both known and unknown confounders since the groups are derived from the same source of populations and should differ only by chance.
- Experiments provide the best chance of obtaining strong evidence of a cause and effect.
- randomized controlled trials allow standardization of eligibility criteria, the maneuvers and outcome assessments.
- randomized controlled trials allow the use of statistical methods, which have few inbuilt assumptions

Disadvantage of Randomized Controlled Trials²⁵

- Randomized controlled trials may be expensive in terms of time, money, and people.
- Many research questions are not suitable for ethical reasons including problems with cooperation, or the reality of outcome.

- To a greater or lesser extent the RCT tends to be an artificial situation, thus, participants who volunteer for an RCT may differ from those to whom the result will be applied.
- Standardized interventions may be different from common practice.

From an epidemiological perspective, the best source for understanding the causes of disease would be a randomized controlled trial (RCT), where all variables are theoretically equal except for the study factor (i.e. smoking) and the outcome factor (i.e., cancer). However, humans are not passive laboratory subjects to be scientific manipulation. The ethics of research into human health and disease place appropriate restrictions on what can be answered by answered by research involving human beings, research which may require non-experimental and methods of enquiry, as already explained, as well as RCTs.

5.5.2 Evidence from Quantitative Modeling

Both epidemiological studies and quantitative modeling provide the quantitative results. Therefore it is essential to understand the main differences between epidemiological studies and quantitative modeling. While epidemiological studies are based on observed information of today's situation, quantitative modeling uses an assumed set of information to predict the health impacts in different future scenarios. In other words, they are used for different purposes. The main connection between these two approaches is the assumptions used in quantitative modeling are normally based on the results from epidemiological studies.

1) Modeling health impacts from a power development plan

With the purpose of predicting of future health impacts in different scenarios or policy options, quantitative modeling can be a useful tool for HIA researchers. The experience of quantitative modeling of health impacts in Thailand can be seen in the case of health impacts from different options of power development plan.

The quantitative modeling of a power development plan is the calculation of disability-adjusted life years (or DALYs), which were developed by the Eco-indicator 99 project funded by the Dutch Ministry of Housing, Spatial Planning, and the Environment (VROM).

The aim of the Eco-indicator 99 project is to develop the indicator scores for life cycle assessment, which can widely used by many European designers and architecture. Through this aim, the calculation of more aggregated impact information is needed. In this project, three types of environmental damages; namely human health, ecosystem quality, and resource are calculated, weighted, and finally integrated into the single eco-indicator²⁶. However, since the focus of this HIA is on health aspect, only the indicator on human heath damage will be applied in this HIA study.

For the power generation, the eco-indicator approach starts its calculation from a fate analysis linking emission of several air pollutants, including SO₂, NO_X, TSP, NMVOC, and CO₂ to a temporary change in their concentrations. Then, it makes an exposure analysis linking this temporary concentration to a dose. Later, in an effect analysis, it links the dose to a number of health effects, like the number and types of respiratory system disorders. Finally, a damage analysis links the specific health effects to DALYs²⁷.

By this way, the units of the end results in the eco-indicator project, which will be used in this HIA study, are the DALYs per Kg of each pollutant emission. Therefore, to calculate the health impact in this study, the calculation of environmental impacts (in terms of each

pollutant emission) is required. Finally, to summarize overall health impacts of all pollutants derived from power generation, the summation of health impacts from each pollutant will be done, with the identification of two important types of health effects; namely climate change and respiratory effects from air pollution.

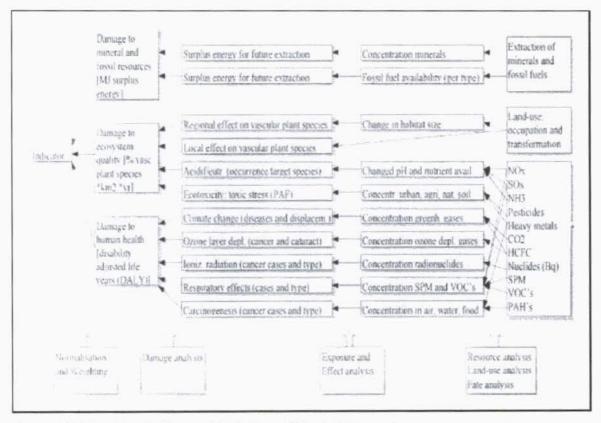


Figure 5.2 The Eco-indicator Modeling of Health Impacts

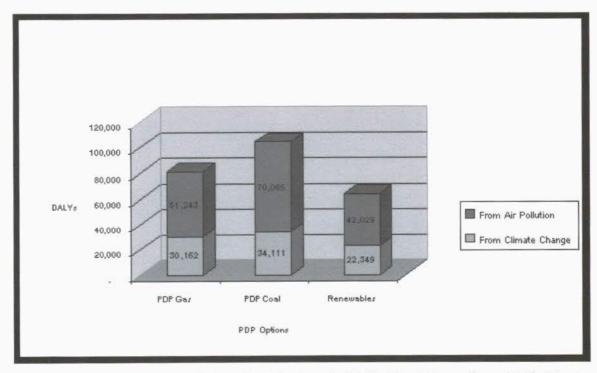


Figure 5.3 Health Impacts of three PDP Options in 2015 (Disability-adjusted Life Year) **Source:** Sukkumnoed and Nuntavorakarn, 2006.

Apart from the Eco-indicator 99, The Extern E Project, a large and long-term EU funding project, also provided information on health impact from different power technologies as presented in Table 5.1. Based on this information, it is possible to calculate and compare health impacts from different sources of power generation or different energy policy options. In Thailand, this approach has provided evidence that the investment in more renewable energy contributions in power plants will lower the health impacts on chronic mortality from air pollution, shown in Figure 5.4

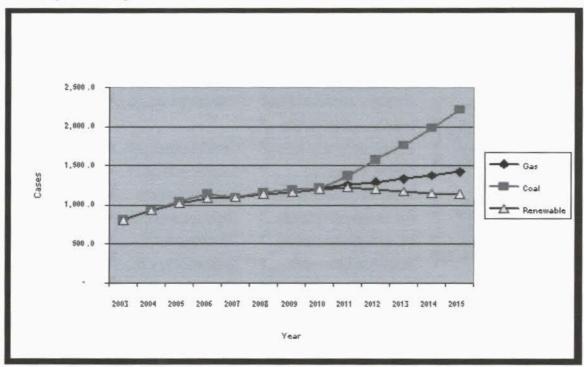


Figure 5.4 Total Chronic Mortality from Air Pollution in Three PDP Options Source: Sukkumnoed and Nuntavorakarn, 2006.

Table 5.1 The Assumed Health Impact Factor of Each Technology from the Extern-E Project Applied to This Study

Co-efficient Item	Unit	Lignite	Coal	Oil	Diesel	Gas	Biomass	Biogas	PV	Hydro	Micro-hydro	Wind	DSM	Cogeneration
Death from accident	Cases/TWh	0.116	0.116	0.033	0.033	0.021	0.000	0.036	0.000	0.002	0.001	0.000	0.000	0.014
Severe Injurries	Cases/TWh	2.670	2.670	0.234	0.234	0.263	0.000	1.102	0.000	0.167	0.083	0.000	0.000	0.176
Minor injuries	Cases/TWh	22.468	22.468	2.471	2,471	1.555	0.000	5.810	0.000	2.176	1.088	0.000	0.000	1.042
Acute Mortality	cases/TWh	3.710	2.786	2.658	2.658	0.039	0.130	0.127	0.000	0.000	0.000	0.000	0.000	0.026
Acute Year of Life Loss	Years/TWh	2.780	2.089	1.994	1.994	0.029	0.100	0.095	0.000	0.000	0.000	0.000	0.000	0.020
Acute Hospital admissions	cases/TWh	6.060	4.557	3.076	3.076	1.757	0.818	3.076	0.000	0.000	0.000	0.000	0.000	1.177
Acute Congestive heart failure	cases/TWh	1.690	1.271	0.913	0.913	0.165	0.250	0.373	0.000	0.000	0.000	0.000	0.000	0.110
Acute Restricted Activity Days	Days/TWh	9991.000	7511.800	5402.000	5402.000	959.000	1134.000	2167.000	0.000	0.000	0.000	0.000	0.000	642,530
Chronic Mortality	cases/TWh	28.870	21.690	15.570	15.570	2.770	4.500	9.050	13.040	0.000	0.000	2.100	0.000	1.856
Chonic YOLL	Years/TWh	288.420	216.860	155,700	155.700	27.700	45.300	90.600	130.400	0.000	0.000	21.000	0.000	18.559
Chronic Bronchitis (adult)	cases/TWh	19.340	14.546	10.377	10.377	1.890	3.080	4.270	1.300	0.000	0.000	0.200	0.000	1.266
Chronic Bronchitis (Children)	cases/TWh	271.720	204.300	147.000	147.000	26.090	42.000	58.960	0.000	0.000	0.000	0.000	0.000	17.480
Chronic cough	episodes/TWh	350.000	261.580	189,000	189.000	33.500	54.780	75.710	0.000	0.000	0.000	0.000	0.000	22.445

Source: Sukkumnoed, 2006²⁸.

2) Limitations and uncertainties of evidence from quantitative modeling

Like other strategic impact analysis, the limitations and uncertainties of the study depend mainly on the availability of information and the appropriateness of the model applied. Based on these two approaches, the health impact analysis in this study faces five types of limitation and uncertainty, as discussed below:

- Not all health impacts can be included in the analysis. Those that are included are mainly the physical health impacts from air pollution, climate change, and accident that can be quantified. All socio-economic consequences cannot be translated into physical units.
- Since both approaches rely on European epidemiological studies and models, they can lead to important uncertainties when applying to the Thai context. Among many differences between Europe and Thailand, there are four main different conditions to be considered: weather conditions; demographical conditions; the coping capacities of the health sector and society; and environmental regulations. For example, the warmer weather in Thailand can lead to greater negative impacts from air pollution thin the population density and more proportion of children in total population can lead to greater negative health impact as well. Poorer coping capacities and environmental regulation are linked to poorer environmental conditions, higher risk exposures, and consequently much worse impacts on health than in Europe.
- Thailand's PDP does not specify the locations of new power plants. Therefore, the actual exposure analysis for Thailand cannot be obtained in this study. As a result this study used direct calculations from amounts of power generation and pollutant emissions without considering the importance of location in its impact analysis.
- In practice, each power plant can lead to different environmental and health impacts, using one impact co-efficient for each technology (assumed all power plants using the same technology) leads to uncertainty.

Although they are facing these limitations and uncertainties, it is still useful and worthwhile to apply these two approaches to analyze health impacts from Thailand's PDP. This is mainly because they can provide an overview of what can happen (i.e. potential health impacts) in each PDP option, based on previously gained international experience and knowledge. The fact no systematic health impact analysis exists from power generation done in Thailand should not be regarded as a major limitation. Without these calculations, the future health impacts of different development options with different power technologies cannot be systematically compared and deliberatively discussed in Thai society.

3) Other Quantitative Models of Health Impacts

Apart from environmental health modeling, like the eco-indicator 99 or the Extern-E project, there are also several other models developed for applying in HIA process. For example, McCarthy and Utley suggest three types of quantitative model, each of which can be applied in HIA³⁰. These are;

PREVENT

PREVENT is a mathematical model developed in the 1980s which uses epidemiological data to predict the population effects of health promotion interventions. The model provides a basis for estimating impacts of changes in population due to heart disease risk factors such as hypertension, blood cholesterol, exercise, and smoking. It has been used for comparisons of health policy between countries and also to identify impacts of potential policy changes within countries.

POHEM

POHEM is a longitudinal micro simulation model of health and disease developed by Statistics Canada. The model simulates a representative population at the individual level in order to draw conclusions that apply to higher levels of aggregation. POHEM enables alternative health interventions to be compared while taking into account the effects of disease interactions. It includes data on risk factors, disease onset and progression, health care resource utilization, direct medical care costs, and health outcomes (http://www.statcan.ca/english/spsd/Pohem.htm)

ARMADA

ARMADA is a mathematical model specifically developed for HIA. The concept was initially broad: to create a model to compare baseline disease rate (mortality, morbidity) in a defined population against the effects due to implementation of economic development (The approach can equally be used to assess the expected beneficial impacts of a policy.)

However, McCarthy and Utley note that developing this quantitative model for HIA still faces the main limitation of a limited range of epidemiological evidence being available³¹. With these three models, only twelve impact areas are usually described in the environmental statement. Some are predominantly concerned with ecological (non-human) concerns; some have a human impact but the scientific relationship to health is not well demonstrated; only in three areas could epidemiology provide quantitative evidence for health impacts.

5.5.3 Evidence from social science and anthropological studies

1) The importance of qualitative evidence

In the real world, there are a number of important health impacts or and related issues to those impacts which cannot be easily or possibly impossible to measure quantitatively through epidemiological or other quantitative studies. Examples of these impacts and issues include

- Ways of life
- Societal and community values
- Spiritual health
- Different interpretations and actions in terms of health, health-related and policy practices

In dealing with impacts and issues in HIA, qualitative methods and evidence play key roles. Apart from the measurement issues mentioned above, qualitative evidence also provides different ways of knowing and understanding of issues. Instead of searching for "probabilistically" generalisability, as is done in quantitative methods, qualitative methods look for findings which are "logically" generalizable. Interestingly, qualitative quests also allow the HIA researcher to understand different logics, such as different interpretation that can be generalized by different people or in different conditions, rather than to confirm specific and static answers as usually done in quantitative methods³².

Popay (2005) presents two different models to describe the ways in which qualitative evidence contributes to evidence-based policy-making³³.

- 1. The Enhancement Model assumes that qualitative research adds something "extra" to the findings of quantitative research by generating hypotheses to be tested, by helping to construct more sophisticated measures of social phenomena, and by explaining unexpected finding generated by quantitative research.
- 2. The Epistemological Model views qualitative evidence as making an equal and parallel contribution to the evidence base through (a) focusing on questions that other approaches cannot reach; (b) increasing understanding by adding conceptual and theoretical depth to the knowledge; and (c) shifting the balance of power between researchers and the researched. Importantly, the epistemological model views qualitative evidence as not necessarily complementing quantitative evidence, but sometimes conflicting with it.

2) Qualitative methods

There are a number of qualitative methods that can be used in HIA. Higginbotham et al (2001, pp.240-241) have summarized qualitative methods normally used in health research, as presented below;

Structured interviews

In structured interviews such as interviewer-administered questionnaires, the HIA researcher follows a standardized guide for the interview and discourages the respondent from providing any extra information. This sort of interviewing is undertaken in more structured types of qualitative research, where the aim is to maximize the standardization of the procedures and the comparability of the data collected from respondents³⁴.

Semi-structured interviews

With semi-structured interviews the HIA researcher has a list of specific topics to be covered but is able to be flexible in the order and wording of questions. This format can obtain comparable information from a large number of subjects of a type that is more complex or sensitive than a structured survey interview can produce. Some researchers refer to this type of interview as a structured in-depth interview³⁵, referring to both the researcher-specified focus on specific topics and the flexible format that encourages the respondent to use their own words to address issues in their own terms and language. This type of interview can also be used to pretest questions using probes and 'think-alouds'³⁶.

Unstructured in-depth interviews

Unstructured in-depth interviews enable the interviewer to select the topic but have no preset questions or order to follow. These interviews can be quite lengthy, often taking more than an hour. Interviewees select the order and control the themes and areas covered in order to express their own understanding within their own frame of reference. The style is conversational although the interviewer may probe for more information. Interviewers can analyse these sorts of data to establish the scope of reaction, the content, and the variety and depth of feeling of people's responses³⁷.

Ethnographic interviews

The ethnographic interview is a particular form of in-depth interview developed in anthropology to elicit specific forms of cultural knowledge from respondents or informants. It is relatively unstructured and non-directive, but uses particular types of questions. The form of the ethnographic interview explicitly acknowledges the role of the informant or interviewee as the cultural expert from whom the interviewer is seeking particular sorts of cultural knowledge. The ethnographic interview requires a good level of local language competence on the part of the researcher, whether the language used be a foreign language or a local dialect or idiom derived from ethnographer's own native language³⁸.

Free-listing techniques

Free-listing techniques are often used at beginning of the research process when the researcher is interested in defining the boundaries of the research area from the point of view of the research subjects. Many qualitative studies start by asking interview subjects to list as many words as possible that refer to a broadly described topic. An important rationale for qualitative approaches is to achieve sensitivity to subjects' understandings of a problem. As well as discovering the boundaries of a particular cognitive domain of knowledge, inference about what is significant or salient for respondents can be made from the frequency and order of their responses³⁹. Weller and Romney (1986, p. 9) have referred

to free-listing tasks as the mapping of a semantic or cultural domain. The domain of interest might be names of diseases or methods of infant feeding, for example 40.

Group interviewing

This refers to a situation where several people respond to topic or questions posed by an interviewer or facilitator. Although a number of group data collection techniques exist (Delphi groups, brainstorming), **focus group** discussions are more commonly used in health and HIA research. Like other interview situations, the group interview may be more or less structured. The advantage of group interviews is the richer information that may emerge from participant's interactions with each other as well as with the interviewer. In focus groups, discussion is triggered and guided by a set of questions or a prompt such as a description of a child's illness, or film, or video⁴¹. However, it is important to understand the dynamics of the group prior to organizing a focus group.

5.5.4 Community-based evidence

Community-based evidence in this training manual refers to the evidence that is collected, analyzed, and concluded by community members themselves. Although they share some common objectives and methods with qualitative methods, community-based evidence differs from qualitative evidence in the sense that the conclusion of qualitative method is still based on the interpretation of researchers who are outside the community.

Since HIA processes place great value on public participation, communities, especially those potentially be affected by the proposed policy, are key stakeholders and main foci of HIA processes. Evidence from them is crucial and should be collected based on their full participation. The types of evidence from community can be both quantitative and qualitative in nature.

1) Importance of community-based evidence

"We are the ones who suffer from all the native impacts. We are the ones who are directly affected. Our lives have been destroyed by dam, but when fish and nature are restored to the impacts of what has happened since the dam gates have been opened. And so we thought of documenting the impacts of opening the dam gates by doing our research. If outsiders conduct the research, we are afraid that they will not see the full picture, and will not consider all issues of the impacts from the dam because they are outsiders who live in cities and do not understanding our lives. They do not know about fish, the ecosystem, and the Mun River like we do. Therefore, we decided to do our research."

(Thongdam Chatapan, village researcher Pak Mun Dam, Ubon Ratchathanee)⁴²

As described above by Thongdam Chatapan, a village researcher, often communities need to run research and the HIA process rather than being respondents and key informants. In Thongdam's words, villagers are now afraid that outside researchers may not understand, or even misunderstanding, their ways of life. As a result they do not want to provide qualitative or quantitative information for outside researchers any more, but instead want to do the research and to be researchers themselves.

The importance of community-based evidence lies on a) the degree of meaningful participation by the local people; b) the degree of transparency; c) the degree of awareness raising for all stakeholders; and d) the balance of power between community and the others within the HIA process.

In practice, external assistance is still necessary for collecting and analyzing community-based evidence, because usually communities in Thailand as in other countries are not familiar with systematic data collection methods. However, it is essential to emphasize that, in this approach, the owner of the evidence and analysis must be the communities themselves, not the outsiders.

Compared to other approaches, community-based evidence is relatively new and consequently may be difficult for HIA practitioner to apply. This training manual provides a numbers of methods for collecting and analyzing community-based evidence, based on types of evidence.

2) Spatial Evidence (mapping, modeling)

In various cases, spatial evidence is very crucial for HIA, especially when dealing proposals leading to physical environmental changes and pollutions. Managing spatial evidence leads to the better understanding of how projects (or policies) will (or already do) affect peoples' lives and health in different ways. Certainly this better understanding can further develop into epidemiological studies for analyzing impacts, more holistic and effective health protection measures, or healthier alternatives in implementing project or policy.

Tools for collecting and reviewing spatial evidence include mapping and modeling. Normally mapping is much easier to conduct and enables adequate conceptualization of the spatial context of HIA cases. However, modeling is essential in dealing with different height or topography of the area under analysis, for example to understand the natural flow of the basin area or to understand the effects of mining on topography and weather changes.

Community risk mapping

Community risk mapping is one of the most well-known tools in community-based evidence in Thailand. It has been used to collect and review the risks (or potential risks) and health impacts (or potential health impacts) around the study area. Normally, HIA researchers will ask the villagers to suggest and discuss about different kinds of risks (or potential risks) in and around the area, which, at the end, will result in the better picture of health impact or health risks in that area.

As mentioned earlier, community risk mapping normally deals with infrastructure projects or pollution-related projects. The example presented here in Figure 5.5 is the case of Mab Ta Phut Industrial Estate (Petrol Chemical Complex) in Rayong, where an HIA researcher facilitated local people from 25 communities to conceptualize different impacts in their localities in order to understand the whole picture of health impacts in this area. Physically, the results showed that health impacts such as respiratory diseases were highly related to the source of industrial pollutions and weather conditions (especially seasonal wind direction). Socially, the risks occurred around the migrant labor camp, slums, and entertainment areas. Later, this community risk mapping was developed into air pollution model and confirmed by epidemiological studies in this area.

In some cases, concept of community risk mapping is oppositely applied to community resource mapping in order to understand the significances of physical and social

environment in and around their communities, which will lead to better environmental protection awareness and strategy.

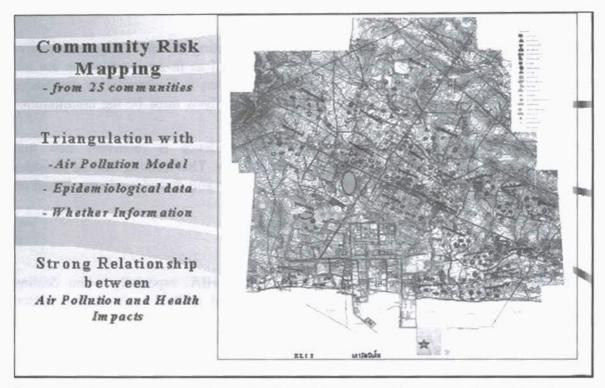


Figure 5.5 Community Risk Mapping from 25 communities around Mab Ta Phut Industrial Estate. Different colors present different kinds of risk in the area.

Source: Sukkumnoed and Tang, 2005⁴³.

Community-based modeling

Normally modeling shares the same objective with community risk mapping - to systematize the spatial evidence - although modeling is more problematic than mapping in presenting three dimensional views,, and is therefore less popular. However, in cases where the typology of the area is important to assist with identifying or analyzing health impacts, modeling is required.

In Thailand, for example, modeling has been used to understand the potential impacts of Potash mining on water quality of natural water resources, as shown in Figure 5.6. Another case is the Wiang Hang lignite mining project, where modeling has been used to see changes in typology during and after mining implementation and the impacts on water and air pollution for this mining project.

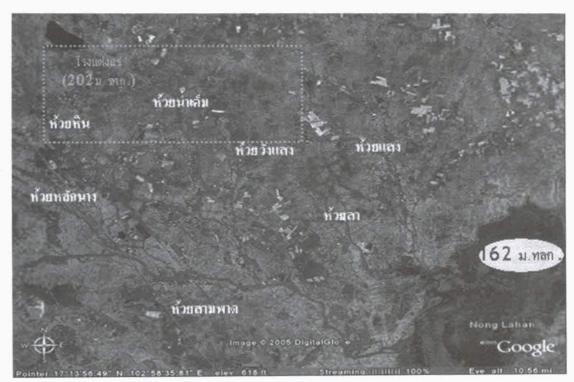


Figure 5.6: The Modeling of Nong Han River Basin and the Potential Impacts from Potash Mining and Processing Plant.

Source: Somporn Pengkham and Bampen Chaiyarak. 2006⁴⁴.

3) Temporal evidence (sequencing, seasonal calendar, clock diagram)

Temporal evidence is usually an important but implicit factor in HIA studies. For example, people usually focus today on conditions without understand how and why these conditions have been developed historically over time. Alternatively people normally do not present clear information about their livelihoods, which may vary due to seasonal conditions. Or urban people may forget to review how long they are able to stay together as a family as part of their daily routine. Tools for managing temporal evidence enable constructive discussion on such issues in HIA,

Historical timeline

There are several ways of using and managing temporal evidence. First, temporal evidence is necessary for understanding the series of changes in community. In this case, historical time lines are useful to collect and to present different impacts that occurred at different periods. The examples in Table 5.2 and 5.3 show how a historical time line has been used to analyze the changes in natural resources, ecology and social conditions, which in turn may alert the local people to rethink and report issues and impacts related to their lives.

Table 5.2 Ecological situation in Thungthong Sub-district from past to present

B.E. 2510	B.E. 2520	B.E. 2530	B.E. 2540-2548 (Present)				
Forests - evergreen forest, mixed forest - trade and investment in wood and timber - fertile - low deforestation	- forest areas decreased; more deforestation due to land encroachment for farming - investors entered for Wood & timber business; logging using hand saw	- sawmills using machine - loss of forest areas - lands are covered by plantations and farms	- loss of forest areas - reforestation				
Wild animals - diverse species of wild animals - hunted for consumption	- animals decreased both in scale and variety; most of which that still exist are small animals	- animals decreased; only butterfly lizards, snakes, and mongeese remain - snake leather trade; merchants' purchase of butterfly lizards and monitor lizards	- few butterfly lizards remain - loss of wild animals - conservation of squirrels, butterfly lizards, and birds				
Soil - fertile - soil's characters are black, crumbly, and damp - no chemical use	- fertile - chemical fertilizers and pesticides were introduced - soil's quality was still good	- use of chemical fertilizers and pesticides - harsh soil - soil with poor quality	- higher soil degradation - cannot grow plants - soil is very tough in dry season - no vegetative cover				
Water - seasonal rains - water was clean, potable and unpolluted - began to use well water - adequate quantity of water for consumption	- seasonal rains - water was clean, potable and unpolluted - began to use well water - adequate quantity of water for consumption	- unseasonable rains - scarce of water, had to make artesian well - water from natural source was dirty and not potable because of contamination - some villages had water supply in B.E.2536-37	- drought in some areas - inadequate quantity of water - conflict over water distribution - water is more contaminated - irrigation system was introduced, but not fully developed				
Air - the air was clean and fresh	- the air was clean and fresh	- the air was clean and fresh	- the air is polluted and has bad smell due to toxins, chemicals, dust, smoke and carbon - straw burnt, causing smoke - bad smell from pigs' dung				

Source: Navin Sopaphum, 2006⁴⁵.

Analyzing evidence for the

Table 5.3 Socio-economic situations of Thungthong Sub-district from past to present

B.E.2510	B.E.2520	B.E.2530	B.E.2540-Present
- farmers used water	- grew sugar cane, corn,	- grew sugar cane,	- burn crops before cutting
buffalo and two-	in-season rice	soybean, two seasons rice	- employed labor from other
wheeled cart	- used water buffalo and	- used artesian well	localities
grew corn, rice, yam,	two-wheeled cart	- in B.E. 2527 the Bank	- wage for sugar cane harvest is 3
bean, and fiber crops	- began to use pushcart	for Agriculture and	baht per Wah (equivalent to 2
- produced for own	and tractor	Agricultural	meters)
consumption and sold	- produced for own	Cooperatives (BAAC)	- wage for sugar cane harvest
the remnant	consumption and sale	was operated in the area	increased
- cleared forests for	- farmlands increased;	- used tractors	- rice priced 5,500-6,000 baht per
farming	more encroachment of	- no longer used water	kwian
- had natural canals	forest areas	buffalo and two-	- farmers are over-indebted
- loan investors	- used rains and natural	wheeled cart	- expense on pesticide increases
rice priced 800 baht per	canals	- no longer used plow	- cultivation costs higher
ton	- borrowed money and	and harrow	- began to have mobile phone
- had savings, no debt	seeds	- rice priced 3,000-5,000	- bio-agriculture was introduced
- wage 5 baht per day	- investment by	baht per ton	- frogs, toads, prawns, fish and
- used storm lantern	capitalists and	- sugar cane priced 300-	snails were lost
- neighbors gathered to	cooperatives	400 baht per ton	- spread of field rats
help at harvest time	- rice priced 1,500-1,800	- no more straw burn	- rice farming year-round
(Long-Kaek)	baht per ton	- capitalists as rice buyers	- rice combine harveter
- drank well water	- had no savings; began	- used measure-off	- began to have orange plantation
- pay rent with rice	to be in debt	system for buying rice	- began to hold Boon Bungfai at
- mostly had own paddy	- pumped up water from	- used pesticide in	Sub-district level
field	natural canals, using	Naprung	- Loy Kratong Festival
- farmlands were in	kerosene can	- employed labor from	- Boon Kathin
conserved forest area	- wage 18-2 baht per day	other localities	- Buddhist Lent and End of
	- used "Polidon" in	- wage for sugar cane	Buddhist Lent
grew non-glutinous and	bean plantation	harvest was 42 baht per	- Songkran
glutinous rice	- owned TV and used	bunch	- less frequent Boon Kao
- preserved rice seeds	batteries	- wage 35-50 baht/day	Pradubdin, Kumkaoyai, and Boor
themselves	- used artesian well	- debt increased while	Kaojee
- had primary school	- used herbicide	savings decreased	
- had the traditions of	- neighbors gathered to	- farmers became	
"Heet Sibsong, Khlong	help at harvest time	BAAC's members	
Sibsee" such as Boon	- in B.E.2525 people	- pesticide had health	
Bungfai, Boon Kaojee,	were not assured to	impacts	,

B.E.2510	B.E.2520	B.E.2530	B.E.2540-Present
Boon Phraves (Boon refers to religious ceremony) - held Boon Heet Sibsong each month - had kitchen garden in farmland - had folk medication - bought medicines from local drugstore	drink water in paddy field - used water buffalo for "Nadum" (a farm on which transplanting of seedlings is practiced) - preserved rice seeds themselves - used bicycle to transport corn to "Tha Makoer" market - had no paved road; used non-asphalt road and ridge - in B.E.2521 a secondary school was established - in B.E.2527 public health center was established - Thungthong Sub-district was part of Wangyang Sub-district - in B.E.2527 Thungthong Sub-district was established - folk medication still existed - still had kitchen garden in farmland	- in B.E.2532 farmers began to buy crops for own consumption - had motorcycle - had truck and pick-up - household expenditure increased - had electricity in B.E.2529 - had TV and refrigerator - spread of plant louses in B.E2535 - used water from artesian well for rice field - had electric water — pump - the tradition of Long- Kaek (gathering at harvest time) declined - began to use engine for rice harvest - "So Por Kor" land entitlement - had to buy seeds - dry-type paddy-sown field - had paved road - Tungsay sub-district was established -tradition of Heet Sibsong Khlong Sibsee began to decline - BAAC affected life of farmers - had more income and purchasing power - young generation could not cook local recipe	

Source: Navin Sopaphum, 2006

Seasonal diagram

Second, to show the complete cycle of their livelihoods, including their traditions, using a seasonal calendar is very useful, as shown in Figure 5.7. This is because rural people's livelihoods are often complex and different in comparison to people employed in urban areas. The seasonal diagram provides a better understanding of annual cycle of their livelihoods and enabling conditions is very essential in HIA. It is also useful in identifying project (or policy) measures and developing better policy and project alternatives.

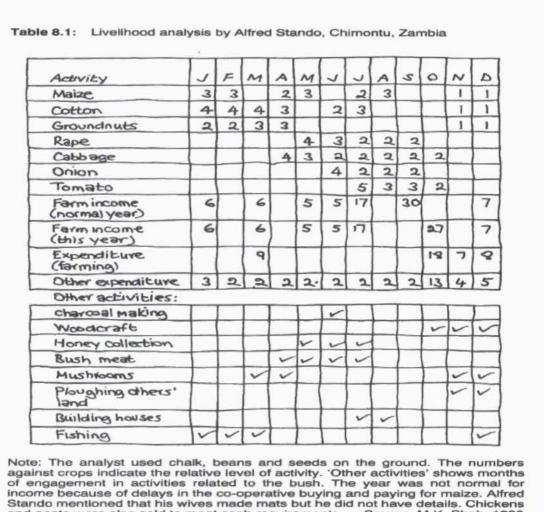


Figure 5.7 Livelihood Analysis by Farmers in Zambia

and goats were also sold to meet cash requirements.

Source: Robert Chambers, 200346.

Clock diagram

Lastly, the clock diagram is used to conceptualize family activities, gender relationships (within the family) and the time of togetherness within the family. The information from the clock diagram may be very useful for revising daily practices and investing more time together within the family. Clock diagrams can also encourage governments to invest in creating environment and infrastructure to encourage staying together as a family, such as playgrounds or museums with flexible opening times, or family TV programs.

Source, M.K. Shah, 1993

	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Father		B			W	Working								B	D	Working			
Mother		e a	1	to ork										c k	n n				
Teenage Daughter		k f a	an			at											e r Intern		
Son		t				Studying										Game			

Figure 5.8 Example of Clock Diagram in Urban Population.

4) Nominal evidence (collecting, naming, listing)

The nominal type of evidence deals with nominal data as it is linked to various kinds of activities, including collecting, naming, and listing. Nominal evidence is very useful in HIA. For example, nominal evidence can be used in identifying the health practices, health effects, or herbal resources in the community, which are usually important information within HIA. Two case examples presented below expand on this.

In the first case, collecting and listing have been used to analyze the herbal and fishery resources of communities, which may be affected by dam construction and operation. The collecting and listing of resource can also be used in raising awareness among community members. Certainly, it can be applied to other kinds of nominal evidence.

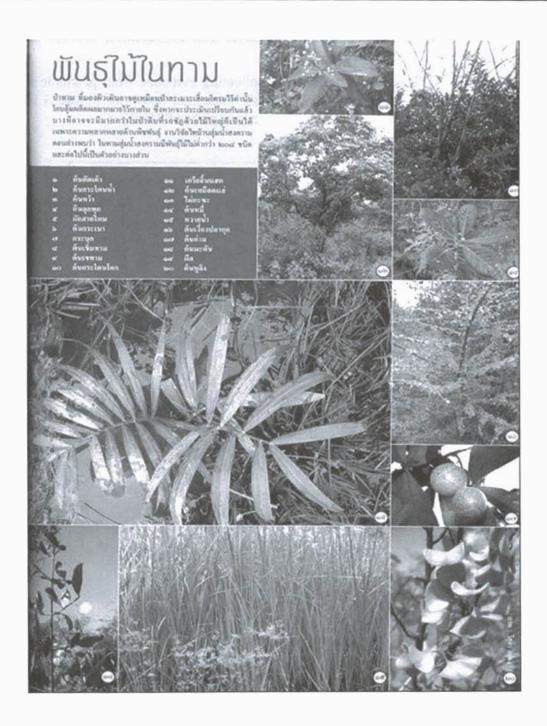


Figure 5.9: Herbal Resource in Tam Forest

Source: Veerasak ChanSonsang. 2006. "Lives in Tam Forest: The Freshwater Mangrove in Esaan". *Sarakadee Magazine*. Vol. 258. August 2006. http://www.sarakadee.com/modules.php?name=Sections&op=viewarticle&artid=58/6&page=3

Body risk mapping

Although the name of this tool is body risk mapping, the outcome is not spatial evidence, but rather the evidence about the different disorders and syndromes within our body. Body risk mapping is very useful for organizing the evidence from occupational practices and pollution exposure. Compared to conventional surveys, body risk mapping is also better in facilitating discussions between people who may share different experiences in health

effects. At the same time, it is also more powerful than conventional surveys in raising awareness for healthier practices.

In Thailand, body mapping has been used in collecting evidence from pesticide spraying during small-scale industrial work. The example presented below in Figure 5.10 is the health effects from pesticide spraying, done in several parts of Thailand.

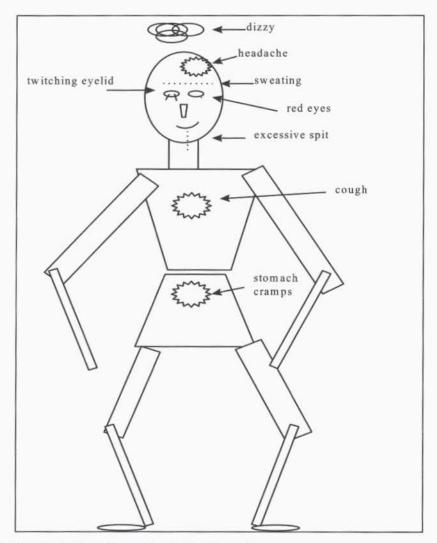


Figure 5.10 Health Effect from Pesticide Spraying

Source: Helen Murphy. 1997. The Health Effects Of Pesticide Use: Methods To Conduct Community Studies With School Age Children.

http://www.communityipm.org/docs/Health%20Effects%20-%20children.doc

5) Ordinal evidence (sorting, comparing, ranking)

Ordinal evidence comes from data that is sorted, compared, and/or ranked. In several cases, nominal evidence has been developed into ordinal evidence in order to analyze and better understand priorities or the importance of different items concerning specific issues. For example, instead of only identifying a hundred herbal resources, the list of the most important resources may be discussed and identified. In HIA, identifying priorities is always necessary for analyzing health impacts and, at the same time, for influencing decision-making. The activities for analyzing ordinal evidence are sorting, comparing, and ranking, as shown in the example.

Table 5.4 Prioritization of Local Species under Threat of Extinction in Thungthong Sub-district

Species	Uses	Causes of extinction threat
1.) Snake-head fish	Food, trade, processing, fertilizer, animal feed, fish sauce	Herbicide, pesticide (insects and golden apple snails), drought
2.) Frogs	Food, trade, breeding	Pesticide (insects, golden apple snails), consumption, trade
3.) Freshwater prawns	Food, trade, processing	Insecticide, herbicide, drought, consumption, trade
4.) Field crabs	Food, trade, processing	Herbicide, pesticide (insects and golden apple snails), drought, consumption
5.) Butterfly Lizards	Conserved animal, food, insect killer, natural classroom	Deforestation, consumption, trade
6.) Grasshoppers	Food, trade	Insecticide, drought, consumption trade

Source: Navin Sophaphoom, 2006⁴⁷.

6) Numerical evidence (counting, estimating, comparing, scoring)

Numerical evidence relates to quantitative information, which is also essential in some HIA case studies. In various cases, quantitative information is required to identify health risks, health potential, or compare different impacts on health. Collecting numerical evidence involves in several activities, counting, scoring, estimating and comparing.

Compared to other community-based evidence tools, numerical evidence may be more complicated and takes time. However, experience in Thailand shows that community can manage to collect the numerical evidence by themselves, with technical suggestions and assistances from HIA researchers.

Two examples are provided that provide further detail.

The first example shown in Table 5.4 is the counting of health risks concerning pesticide storage in their own households done by the community member themselves, which creates alerts concerning their daily but unhealthy practices.

Table 5.5 Number and Percentage of Specimens of Farmers in Thungthong Subdistrict using Chemical Pesticides, classified by storage and disposal of pesticide vessels.

	Number (n=188)	Percentage
Place of chemical pesticide storage		
- stored in farms/plantations	13	6.91
- stored in houses	52	27.66
- have place of storage separated from house but without key lock	85	45.21
- have place of storage separated from house with key lock	23	12.23
- other places (i.e. ,etc.)	15	7.98
Risks from chemical pesticide storage		
- stored near cooking areas such as kitchen	12	12.90
- stored near livestock/pet	25	26.90
- stored near fresh water sources	4	4.30
- stored within the reach of children	68	73.10
- not near any places mentioned above	12	12.90
Some households may store pesticide close to more than one places above		

Source: Navin Sophaphoom, 2006⁴⁸.

The second example shown in Figure 5.11 is the comparison of different health effects between the villages that are close to tangerine plantations, and the villages located further away from tangerine plantation, also done by local people themselves.

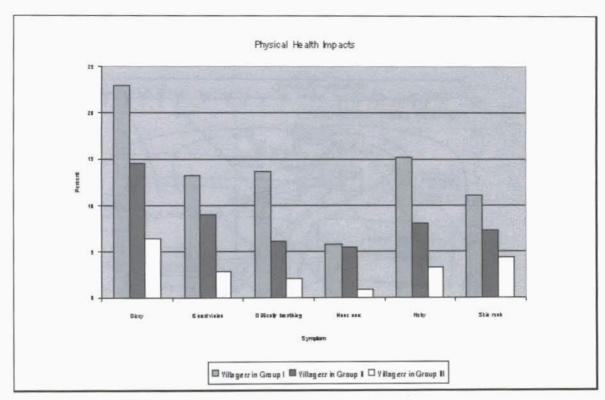


Figure 5.11 The Comparison of Physical Health Impacts between People in Different Locations from Near to Further Away from Tangerine Plantation.

The figure shows that the villagers located near the tangerine plantation face larger physical health impacts compared to villagers who live further away from the tangerine plantation.

Source: Nuntana Sabrum, 2004⁴⁹.

7) Relational evidence (linking, relating)

The last type of community-based evidence is relational evidence, which attempts to show the connection, association, or causal relationship between different factors in HIA studies. Developing relational evidence is done through the conceptualization of various factors and evidence that have occurred within and around communities. In other words, it is usually done after the presentation of other evidence during the HIA or other evidence collection process, in order to ensure that the conclusions will be based on the agreed evidence discussed with community members. The activities in conceptualization is linking and relating of different factors as shown in the two examples from the Robert Chamber's book on "whose reality counts?", where communities try to show the nutrient flow diagram in their farm and the causes of their hunger. This is represented in Figures 5.12 and 5.13 below.

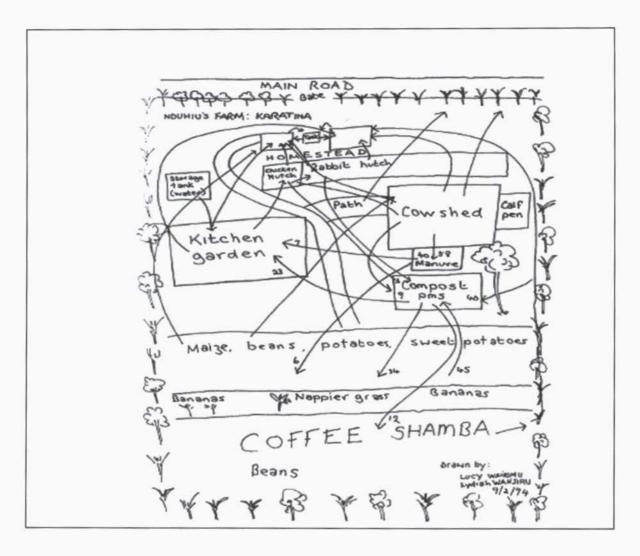


Figure 5.12 A Farmer Nutrient Flow Diagramming on Her Farm Map, Kenya, 1994

Source: Robert Chambers, 2003⁵⁰.

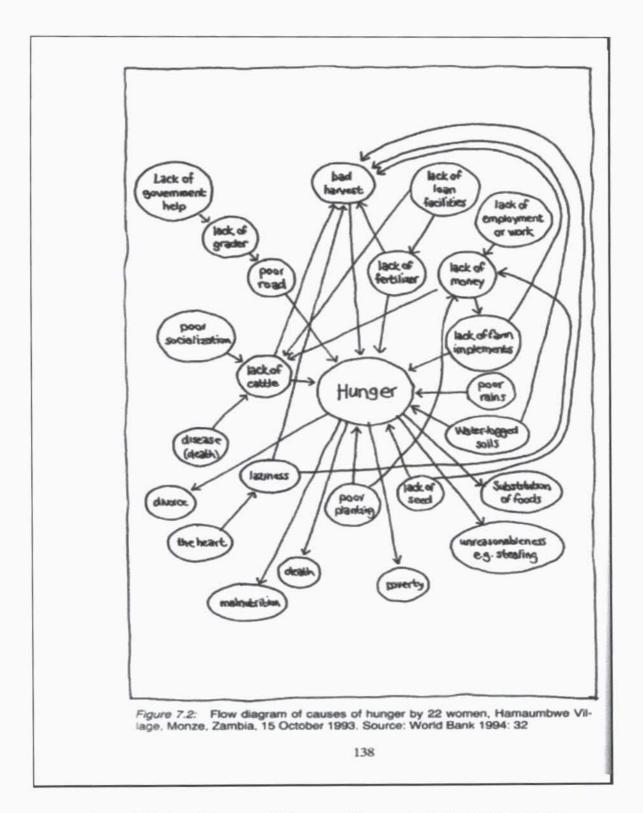


Figure 5.13 Flow Diagram of Causes of Hunger by 22 Women, Zambia Source: Robert Chambers, 2003⁵¹.

8) Reversals of power: from extracting to empowering

Robert Chambers (2003) stresses the importance of participatory rural appraisals (PRA), including community-based evidence analysis, that enables the reversal of relations between upper and lower classes within the society. According to Robert Chambers, in PRA, initiative and control are passed to local people using the metaphor (and sometimes reality) of "handing over the stick" (or chalk, or pen). These shifts have built-in tendencies towards reversals of power from outsides as uppers to local people as lowers⁵²:

- from close to open restrains the normal dominance of the etic (referring to outsider), and encourages expression of emic (referring to insider), reality;
- from measuring to comparing enables the expression and analysis by people concerning realities and preferences which are otherwise inaccessible (because they are not measured or measurable) or sensitive (when expressed in absolute rather than relative terms);
- from individual to group shifts the balance of power, with a lower ratio of outsiders to insiders:
- from verbal to visual empowers local people to express their reality- those who are marginalized, who do not read or write, women, children, of those of low social status:
- from paper, table and wall to ground reduces the dominance of the few who hold pens, sit at table, or stand at the wall, and encourages and enables more participation of others, including those who speak less and who are less literate. The ground empowers the weak, and brings the strong down to the same level. There is less eye contact, less use of words, and greater ease of action;
- from reserve to rapport and from frustration to fun helps outsiders facilitate analysis conducted by insiders, and releases social energy.

5.6 Where are the sources of evidence and how can we get them?

Most HIA projects use evidence from existing secondary sources and conduct primary research to get new information in the field. Existing sources of evidence are those routinely collected by service providers or responsible authorities such as the National Statistics Office and research granting agencies. The internet today is also the first entry point for most HIA projects. Research results databases are major sources of published research results. Famous research results databases are the Campbell collaboration reviews, the Cochrane review, the Center for Evidence Based, and many specific databases etc. However, there are limitations of using existing information from these sources. For example: 1) the context specific nature of a proposed policy; 2) Cochrane reviews contain mostly clinical research, not research specifically related to policy; 3) the Campbell collaboration has a limited range of policy coverage; 4) evidence from service providers might not be collected systematically, hence, the sample used may not be representative of the population.

The need for improved sharing and dissemination of lessons learned from previous HIA studies of countries from around the world is urgent and real. Similar policies and similar health impacts could then be studied and learned with less effort involved.

Whether we have to conduct studies to get the primary data or not depends upon resources and time limitations. However, conducting qualitative studies with community participations are also suggested as this enables public participation.

5.7 How do we use the evidence?

As already shown in this section of the manual, different methods in collecting and analyzing evidence are based on different epistemological bases, different purposes, different ways of knowing, and, in many cases, different results. Therefore, the selection of analyzing evidence gathering and analysis methods is always complex for HIA practitioners.

5.7.1 Issues in analyzing evidence

In some cases, institutional frameworks surrounding the HIA explicitly and implicitly determine the approaches in analyzing evidence. In the other cases, there are several factors or issues to be considered in analyzing evidence. Five consideration points are identified below:

1) Quality of Evidence

Each method usually has its own quality criteria, such as validity and reliability, which differ greatly between methods used (also see part II for more detail). Therefore, we must ensure that each of our evidence follows the quality criteria prescribed for each method type.

2) Participatory

Different methods of finding evidence involve different degrees of participation. For example, in epidemiological studies, communities are only respondents in the analytical process, while in qualitative methods, they can be key informants, and in community-based assessment, they become the researchers themselves. As HIA requires a higher degree of

participation in the decision-making process, the broader opportunities for participation should benefit the HIA process as a whole.

3) Transparency

Linked to different degrees of participation, different ways of finding evidence also leads to different ways and degrees of transparency within the HIA and decision-making process. More 'scientifically' sophisticated methods, like quantitative modeling, may gain more academic creditability, but, at the same time, because only few academicians are involved in this process, may reduce public transparency and credibility in the HIA process, especially compared to more open analysis processes like the use of community-based evidence.

4) Comprehensiveness

Normally, HIA aims to understand the whole picture of health impacts from specific policies, programs, and projects, including the linkages between changes in conditions of living or ecosystems and health outcomes. Therefore, the evidence used in HIA should also present the links between the various living conditions and health impacts at a broad level, not only confirm one specific cause and effect relationship.

5) Timeliness and Practicality

In practice, HIA practitioners do not have huge resources at their disposal. More importantly, they often face time limitations in terms of decision-making or policy influences. At the same time, we cannot expect them to have expertise in all the methods and issues presented in this manual. Therefore, both time limitations (in order to contribute to policy-making process) and other practical issues must be discussed and analyzed in selecting appropriate ways of finding the evidence in each HIA process - this is best done during the scoping step.

5.7.2 Triangulation

"Triangulation is a strategy for ensuring that a study's finding are not the artifact of a single method, a single source, or a single investigation's biases. It is, therefore, a means of increasing confidence in the validity or authenticity of the data and its interpretation.'

William and Johnson, 1996 (p.5)

Triangulation is not a method in itself, but a methodological strategy. William and Johnson (1996)⁵³ provide a clear explanation of the types of triangulation encountered in social research.

- Triangulation of data sources, which involves comparing the consistency of different pieces of information, including:
 - Comparing public and private comments:
 - Checking for consistency in people's behavior; and
 - o Comparing information obtained through interviews and observations with that written documents
- Researcher triangulation, which involves using more than one person to collect and analyze data, for example:
 - Using several interviewers so that results cannot be attributed only to a particular interviewer's style or personal characteristics:

- O Several people making observations of the same phenomena:
- Several people independently analyzing the same qualitative data set and comparing their findings; and
- Inviting the subjects of the study to review the findings.
- Method triangulation, which involves the use of more than one method to collect data, for example:
 - Comparing data from one or more qualitative methods with data from one or more quantitative methods;
 - Using several different qualitative methods (focus groups, in-depth interview); and
 - Using a number of different sampling strategies.

However, in several cases, these three types are not sufficient to confirm evidence or understand different interpretations within the HIA process because the difference, in terms of analysis and interpretation, may arise from different perspectives on health or different theoretical levels. Therefore, if possible, this manual suggests to include:

- Theoretical triangulation, which involves different perspectives on health and health impacts and involves different ways of explaining health impacts in the HIA process, such as:
 - Using or allowing both tight and broad perspective to play meaningful roles in the HIA process; or
 - Using different views or allowing different explanation of health impacts to be assessed or tested in the HIA process.

5.8 Challenges

Use of evidence in HIA is becoming an increasingly essential element in the current era of evidence-based policy and practice. However, this chapter has provided useful different perspectives in considering evidence. Values, and ultimately the aims of social development, are core principles of any human activities including use of evidence in HIA. These values and aims will frame efforts in identifying and searching for evidence for HIA. Technical knowledge in applying a particular method of using and analyzing evidence must be shaped with ethical considerations and the benefit of mankind in mind.

A Summary of Key Points

- * Evidence is a very important aspect of HIA, as evidence determines the outcomes of HIA and the creditability of policy recommendations made.
- * Evidence is referred as "the results of systematic investigations, aimed at increasing sum of knowledge" (Chambers Dictionary) or "testimony or to other information form which inferences can be drawn" (Oxford English Dictionary)
- * HIA tries to systematically collected data on the impacts of policies, programs and projects and facilitate the discussion and conclusion on the balance between benefits and harms in human health perspective.
- * It is necessary to understand differences in evidence from different disciplines or school of though that may arise in HIA process.
- * The evidence and methodologies using in this manual can be divided into four main categories, as followed:
 - 1. Epidemiological evidence:
 - 2. Evidence from quantitative modeling;
 - 3. Social science/qualitative evidence; and
 - Community-based evidence.
- Epidemiological evidence is the study of the distribution and determinates of health related state or events in specified populations and the application of this study to control health problem.
- * Quantitative modeling uses an assumed set of information to predict the health impacts in different tomorrow scenarios. The assumptions used in quantitative modeling are normally based on the results from epidemiological studies.
- Social science/quantitative evidence is using for explaining and understanding a number of important health impacts or and related issues to those impacts which cannot be easily or possibly impossible to measure quantitatively through epidemiological or other quantitative studies e.g. ways of life, societal and community values, spiritual health etc.
- * Community-based evidence is collected, analyzed, and conclude by community members themselves. Although they share some common objectives and methods with qualitative methods, community-based evidence differs from qualitative evidence in the sense that the conclusion of qualitative method is still based on the interpretation of researchers who are outside the community

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PART VI Public Participation in HIA Process

PART VI Public Participation in HIA Process

In this part we will discuss about public participation in HIA. Public participation is an indispensable part of HIA process. It is also an important as a natural aspect of decision making in our democratic world. Public participation is linked with the right to citizenship. It recognizes the participation of people as full citizens in society and it relates to the development of society. The ultimate aim of participation is the establishment of a policy from which all citizens rightly benefit, especially in terms of health and quality of life.

This part covers the following issues:

	Why public participation in HIA?
\Box	Who are the participating public?
	What are the roles of local community in HIA?
Ш	What actions are needed for public participation?
	When should public participation be integrated in the HIA and decision-making process?
Ш	How should health authorities and experts be involved in the HIA process?
	How to identify the public who are interested in HIA?
	How to communicate to the relevant public?
	What should the information consist of?
Ш	What is the management capacity essential for public participation?
	What kind of evaluation is needed for the public participation process in HIA?

6.1 Why public participation in HIA?

Health Impact Assessment (HIA) is "any combination of procedures or methods by which a proposed policy or program may be judged as to the effect(s) it may have on the health of a population". There can also be both direct and indirect effects on health, with the indirect effects acting through the determinants of health. HIA process emphasizes public participation as a key component.

The HIA process is generally divided into steps i.e. screening, scoping, assessing, suggesting/influencing, making decisions and monitoring. Public participation must be properly included in each step. Public participation in HIA will improve:

- the quality of the assessment participation by a range of stakeholders will ensure that the potential health impacts identified and characterization of potential impacts will be comprehensive and reflect local experience;
- the quality of the final decision local needs and concerns will have been brought into consideration:
- the quality of democratic processes in relation to service provision; and
- the transparency of the process by opening its underlying values and precepts to public scrutiny.

Experience has shown that lack of participation can lead to protests by local people, create enormous social conflicts, and sometimes projects cannot be implemented at all with the project owners losing their initial investments.

6.2 Who are the participating public?

The public in the HIA context consists of the following major groups:

- **Stakeholders:** anyone involved in or who will be affected by a proposal. The exact composition of a stakeholder group for HIA will depend on the nature of the proposal being assessed; the catchments' area for the proposal; and the communities affected by the proposal either negatively or positively;
- * Key informants: people whose roles or standing in the community results in them having knowledge or information of relevance to the proposal and its outcomes;
- professionals/academics who have specialist knowledge in relation to the health impacts on a particular proposal; may also be referred to more generally as stakeholders;
- * Assessors: those responsible for leading the appraisal of health impacts, report writing, and framing the recommendations about modifications to the proposal; may be specialists appointed from within an organization/partnership or specialists commissioned from a centre with expertise in HIA; accountable to the steering or management group.
- * Steering/Management group: those responsible for overseeing the HIA, and appointing the assessors, whether internal or external; may or may not be the decision-makers responsible for taking decisions on the recommendations about modifications to the proposal after appraisal of health impacts.

Decision-makers: those responsible for taking decisions on the recommendations about modifications to the proposal after appraisal of health impacts; may or may not be the steering or management group for the HIA. HIAs are most likely to be effective if decision-makers are involved on the steering or management group.

6.3 What are the roles of local community in HIA?

Local communities affected by the proposal are key stakeholders in the process of health impact assessment. However, it is worth bearing in mind that the term "community" can be used in a variety of ways². It may refer to:

- * residents in a specific geographical area;
- people who share a common characteristic, e.g. ethnic origin, age or sex;
- people who share a common interest or need, e.g. careers; or
- people united by a single main attribute, e.g. cyclists.

For all these uses of the word "community" may be relevant when undertaking an HIA, and should be considered when identifying stakeholders. In addition, it is important to be aware that³,

"In modern societies, especially highly urban societies, individuals rarely belong to a single distinct community but maintain membership of a range of communities based on variables such as geography, occupation, social contact, values, leisure interests and other important features of their lives."

6.4 What actions are needed for public participation?

Public participation covers a wide range of actions. The Aarhus Convention emphasizes that "at a minimum it requires effective notice, adequate information, proper procedures, and appropriate taking into account of the outcome of public participation". Thus, processes and outcomes of involvements are considered.

Community participation can vary in nature, as shown in the pyramid, the higher the level in the pyramid, the greater the degree of responsibility, management and control the community has over any initiatives undertaken.

Community control
Community action
Community management
Community co-option
Community consultation
Community provision
(e.g. information, services)

Figure 6.1: Community participation pyramid

When designing a health impact assessment, it can be helpful to think of community participation in terms of the basic models of community development. (see Table 6.1).

Table 6.1: Models of community development

	Model 1: TOP DOWN	Model 2: INTERMEDIATE	Model 3: BOTTOM UP
Initiator(s)	The State	Professionals whose job is to encourage collaboration	The community
Nature of the aim(s)	To improve the quality of people's lives	Generally altruistic or paternalistic	Representative of the community's views and interests; the focus is that of self-help
Anticipated outcomes	 To deliver more effective services To draw on the community's own resources To complement the official provision of services 	To enrich people's lives To improve the conditions in which people live To enrich people's lives To enrich people's lives	 To enrich people's lives To improve the conditions in which people live through community participation

At present, most of the health impact assessment projects undertaken may fall under Model 2, especially during the introduction and initial use of HIA within an organization or partnership. The community rarely leads the HIA (Model 3). HIA practitioners should see Model 3 as the ultimate aim.

6.5 When should public participation be integrated in the HIA and decision- making process?

Active participation should be undertaken as early in the policy process as possible to allow a greater range of policy solutions to emerge and to raise the chances of successful implementation. Adequate time must be available for consultation and participation to be effective. Information is needed at all stages of the policy cycle.

It is generally accepted that the introduction of public participation and health impact assessment at all decision-making levels is very important. Therefore HIA, integrated with public participation, should start at an early stage of HIA – preferably screening.

Public involvement in screening should begin as soon as there is enough information available and while options are still open.

Public participation can help integrate environmental, social and health concerns; and support sustainable development objectives. To achieve this purpose, it should be encouraged in all stages of the decision-making process.

6.6 How should health authorities and experts be involved in the HIA process?

Health authorities should be involved in the same manner as environmental and sociological authorities. In order to meet this concept, notification and consultation of all related authorities should be a mandatory requirement of HIA systems. In addition, clear HIA guidance should be stated to identify how and when to involve each authorities.

6.7 How to identify the public who are interested in HIA?

The public should include:

- 1) the general public for which the plan is developed;
- interested people and NGOs; and
- the public affected especially in the poor areas or those at risk of being socially excluded.

The public bodies should be proactive in identifying and involving the public. Only consulting with NGOs is not sufficient.

6.8 How to communicate to the relevant public?

The public must be informed using various media. Passive notification of the general public should be combined with proactive notification of interest groups.

Passive notification includes public announcements and broadcasts in relevant media and on web pages.

Proactive notification or direct contact should be used to inform members of public who are directly affected groups and do not have access to information due to limited resources (e.g. the poor).

6.9 What should the information consist of?

All information used in the decision-making process and all related HIA documents should be made publicly available. Public comments and inputs on the documentation should be made publicly available. Finally, all information should be addressed with a clear and concise summary of the key issues.

Public comments should be formally documented and made publicly available. Public comments can be taken into account at different stages of the HIA process, notably in screening; scoping; preparing HIA reports; influencing policy; and the monitoring /evaluation of policy. The related organizations should pay attention to respond to any comments systematically. Information provided by government during policy-making

should be objective, complete and accessible. All citizens should have equal treatment when exercising their rights of access to information and participation.

In Thailand, access to public information is guaranteed by law. A public information committee has been established to receive complaints if the law is breached by any public bodies. The law promotes transparency of public organizations.

6.10 What is the management capacity essential for public participation?

Efficient co-ordination is an essential management capacity needed for fruitful public participation in HIA. Request feedback from and consultation with citizens should be coordinated across government units to enhance knowledge transfer, ensure policy coherence, avoid duplication and reduce the risk of "consultation fatigue" among citizens and civil society organizations. Co-ordinated efforts however should not reduce the capacity to develop innovation and flexibility, in order to achieve meaningful public participation in different policy and decision-making processes. An agency should be specially set up for this purpose.

6.11 What kind of evaluation is needed for the public participation process in HIA?

Any actions, including public participation process, require evaluation. Evaluation provides information for improvement and empowerment.

Any organizations need tools, information and capacity to evaluate their performance in providing related information, conducting consultation and engaging citizens, in order to adapt to new requirements and changing conditions for policy-making process. Evaluations of both the process and outcome of public participation in HIA are essential.

A Summary of Key Points

Public participation in HIA can add value to decision-making for healthy public policy in a number of ways:

- It can contribute to a transparency accounting of the social, economic, environmental, health costs and benefits of a decision which would affect different segments of society.
- It can serve as a tool to integrate health, environmental and social concerns into decision-making processes to produce decisions that support sustainable development.
- It can serve as a mechanism to manage social conflicts by bringing different stakeholders and interest groups to the same table to discuss a negotiated agreement.
- It can raise awareness of the citizen. It can strengthen citizens' education and skills, as well as support capacity-building among civil society organizations.
- Ultimately, the whole of society will benefit from the active and dynamic involvement of citizens to ensure healthy public policy.

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Training Approach

1) Tentative Program for 5 Days Training

Date	Time	Sessions
Day I	9.00 - 10.00	Introduction to Training Course
	10.00 - 10.30	Key steps for HIA
	10.30 - 10.45	Break
	10.45 – 12.00	Key Successes for HIA
	12.00 - 13.00	Lunch
	13.00 – 14.15	group work I (Analyzing potential health impacts)
	14.15 – 15.00	Understanding Health Impacts
	15.00 – 15.20	Break
	15.20 – 17.00	Understanding Potential Health Impacts
	18.00 – 20.00	Welcome dinner
Day II	9.00 – 10.15	Analyzing Policy alternatives
	10.15 – 10.30	Break
	10.30 – 12.00	Group work II (Analyzing policy alternatives)
	12.00 - 13.00	Lunch
	13.00 - 13.30	Analyzing Policy Process
	13.30 – 14.30	Group Work III (Analyzing Policy Process)
	14.30 - 15.00	Discussion
	15.00 – 17.30	Field Visit I
Day III	9.00 – 9.30	Understanding the evidence
	9.30 – 10.30	Epidemiological evidence & Quantitative method

Date	Time	Sessions
	10.30 - 10.45	Break
	10.45 – 12.00	Qualitative and Community-based evidence
	13.00 – 14.00	Group Work IV (Analyzing the evidence)
	14.00 – 15.00	Discussion
	15.00 – 17.30	Field Visit II
Day IV	9.00 – 10.15	Public Participation in HIA process
	10.15 – 10.30	Break
	10.30 – 11.30	Group Work V (Facilitating Public Participation)
	11.30 – 12.00	Discussion
	12.00 - 13.00	Lunch
	13.00 – 14.00	Putting things together
	14.00 – 15.30	Group Work VI (Design HIA Process)
	15.30 – 15.45	Break
	15.45 – 17.00	Group Presentation and Discussion
	19.00 – 21.30	Farewell Party
Day V	9.00 – 10.30	Presentation on HIA Development Plan in South East Asia
	10.30 - 10.45	Break
	10.45 – 11.00	Presentation of concrete plan for regional collaboration
	11.00 – 12.30	Discussion
	12.30	Closing Ceremony

2) Group Works and Case Studies

During the 5 days of the training, the participants will be divided into three working groups which each group will be assigned to do exercises on different HIA case studies. The following case studies are used for group discussions during the training course.

- The Tangerine Plantations in the Fang Watershed, Northern Thailand: the unsolved health crisis of the local communities;
- Provincial energy planning: the challenges of growing demand; and
- Healthy transportation? local transportation alternatives in Chiang Mai

Case Study I (1)

The Tangerine Plantations in the Fang Watershed, Northern Thailand The unsolved health crisis of the local communities

Background Situation

Since 1995, tangerine has become a popular new crop grown in the area of Fang Watershed, due to its price being higher than other main crops. As a consequence, tangerine cultivation areas have rapidly expanded. At present it is estimated that the tangerine plantations cover an area of more than 16,000 ha.

The promotion of tangerine cultivation in northern Thailand has become a seriously controversial issue for local communities for more than ten years. Local people have greatly suffered from the intensive enlargement of large-scale tangerine plantations in the Fang Watershed - which is also one of the most important natural forest areas in the north of the country - because effective control measures have not been implemented.

The tangerine plantations have been expanded in the Fang Watershed area without systematic control measures from any relevant authorities. Furthermore, as the tangerine is a plant that has various kinds of pests and diseases, the plantation owners have to constantly use many agrochemicals and pesticides. With respect to this, there has been an intensive use of a number of various agrochemical and pesticides in the Fang Watershed area for several years. Unquestionably, this has caused many serious problems for the local communities who live nearby the plantation areas.

The villagers in the Fang Watershed area have encountered a number of extremely serious problems, which mainly are consequences of the tangerine plantations. These include chemical odors, water contamination, invasion of public property, deforestation, illegal use of foreign labor, social conflicts etc. The villagers tried many times to complain about these problems - particularly the terrible chemical odor - with local authorities as well as with relevant provincial officers. However their voices were not heard, and there have been no any meaningful resolutions from those authorities. As a result they have had to cope with these serious problems themselves.

Perspectives of different stakeholders:

The local people

Tangerine plantations cause many adverse impacts to our community e.g. bad odor from pesticide use and the contamination of water sources, which are particularly problematic for children and the elderly. Moreover, the plantations invade the natural forest while using a lot of water, leading to both water scarcity and conflicts.

The plantations should reduce their area, not destroy the natural forest, and use less agrochemical and pesticide. The buffer zone between the plantations and local communities is very necessary to solve the problems.

The Fang Conservation group

The plantations are the main cause of deforestation and conflicts over water supply. We are seriously concerned about the impacts of pesticide use both to the environment and to human health. The plantation should be reduced in size, and change to use biological controls and organic farming. The illegal occupation of the natural forest area should be brought to court and the instigators punished.

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Case Study I (2)

The local NGO working for sustainable agriculture

Public discussion has been limited to issues of food safety and safe agricultural practices for the Tangerine plantations. But actually the main problem is the process of Tangerine production, which is an intensive large-scale monoculture throughout the area, which is highly sensitive. So this causes many severe impacts, and this has been the experience of Rangsit area. The expansion of the plantations should be stopped and replaced by organic farming.

The local health authorities

There have been many complaints about the health impacts from the plantations. But preliminary findings point out that the impacts are not so significant. Moreover, the diagnosis cannot identify the exact source of health hazards and thus cannot link the health effects to pesticide exposure. Some staff also guess that the cause of these health effects may come from other factors, such as increase of smoking among local people, the trend of colder weather in the area, etc.

The environmental authorities

The investigation of pesticide contamination in the local environment found that most of the residues are under standard. So there is no significant impact and, thus the mitigation measures are not the priority. However, based on their personal experiences in the local areas, they realize that there are problems and impacts from pesticide uses, particularly from the large plantations. Hence, they are also trying to find the other ways to investigate the impacts.

The local agricultural authorities

The investigation of pesticide residues in Tangerine products found that these are also under the standard of food safety. So we recommend that Tangerine production should continue, but with the promotion of 'Good Agricultural Practice', which is the guideline developed by the Ministry of Agriculture for safe agriculture.

The Provincial and District Offices

The Tangerine production in the Fang watershed is very famous nationwide and is very important to local economic development. The Tangerine plantations are also the tourist spots. Therefore, production has to continue and we will cooperate with the responsible authorities to address the concerns of the local people.

The plantation's owners

Our plantations are a large-scale investment, so there are many technologies used to control and improve production. We are also concerned about the impacts of pesticide use and we can ensure that all of the pesticide used is of high quality and used correctly, particularly, when compared to the small-scale cultivating, which we believe is actually the main cause of the problems.

Small-scale Tangerine farmers

We are the local people in the community and Tangerines are our main source of income. The impacts from our farms, if there are any, are far less than that of the plantations. Also, we do not invade the natural forest and not cause the conflicts over water resource. But if the public have the misunderstanding about dangerous Tangerine products, the price may be reduced and this will have big impacts to our families.

Case Study II (1)

Provincial Energy Planning: The Challenges of Growing Demand

1. Introduction

This province is situated by the sea and contains five districts, 4,000 villages and a total population of around 400,000. The urban area contains 800 villages, with the other 3,200 villages are in rural areas. 400 villages have no access to electricity, mainly those in the mountainous area.

The majority of the populations work in the agricultural sector. The main products include rice, sugar cane, cassava, coconut, and palm oil, as well as fishery resources. There are also many pig and chicken farms.

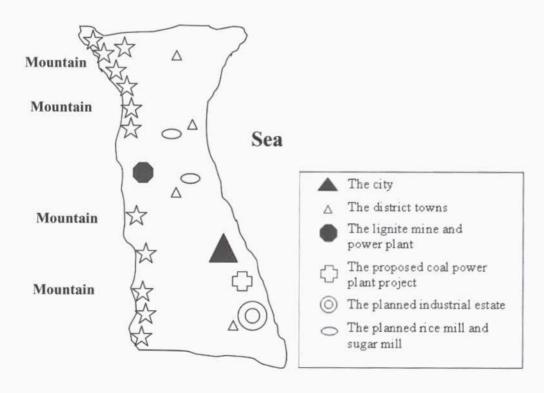
The industrial sector is comprised mainly of agro industries, such as rice mills, sugar mills, and palm oil factories. Lastly, the commercial sector is quite small but is growing.

2. The main problems and challenges

Rural electrification is an important issue. Moreover, electricity demand is increasing every year. According to the Regional Development Plan, the province is set to be the hub for large-scale industries.

The only existing power plant has not enough capacity, even with the present demand. Since lignite is the main fuel, the plant and its mine have caused severe impacts to the environment and local communities for a long time. So a new coal power plant project has been proposed.

The overall picture and the key information of the electricity system in the province are as follows.



Case Study II (2)

3. Demand (the total demand of 400 MW at present)

3.1 Residential sector

Present Total demand of all villages in the urban area is 150 MW and 50 MW in the

rural area.

Growth about 1-2% per year, but rural electrification is an important issue.

3.2 Commercial sector

Present Four district towns altogether demand 30 MW and 30 MW for the big city

Growth about 7% per year but the more important is that two big shopping mall

planned to be open in the city in late 2007 and need 20 MW altogether.

3.3 Industrial sector

Present The total demand for all factories is about 140 MW

Growth the demand is still growing about 5% annually. The more urgent issue is that

two big agro industries, Rice Mill and Palm Oil factory, are planned to be open and need 60 MW more, while a new industrial estate, targeting iron and steel industries, is planned and the expected electricity demand is about 500-1,000

MW

4. The electricity supply at present

An old lignite fire power plant of 300 MW
 The environmental mitigation measures, mainly for the SO2 from the power plant, have been implemented.

- 2. Receive around 100 MW electricity from a big gas power plant in another province. The gas power plant has enough generating capacity for the growth of this province, but not for the big industrial estate. There are some concerns about impacts from the gas power plant, including water scarcity due to huge water use and hot wastewater released to the river.
- 3. Due to long distance in the province, power disruptions happen quite often. This is not favorable for the industrial and commercial expansion. The loss in transmission system is also high.
- 4. One big pig farm with the biogas system producing 5 MW electricity.
- 5. Two sugar mills using the Cogeneration system to produce electricity and heat from bagasse (5 MW each)
- 6. Ten solar cell systems (0.03 MW each) for 10 villages in rural area without electricity

5. The policy discussion at present

Ministry of Energy strongly supports coal and gas. Their main policy is gas, so they propose the expansion of the gas power plant. The energy experts support this idea because gas is the cleanest fossil fuel. They also generally support renewable energy, energy efficiency, and energy saving. They have some programs and many demonstration projects.

But since gas is already accounted for about 75 percent of power generation, the Electricity Generating Authority of Thailand strongly proposes to expand the existing lignite power plant, because of lower investment and less loss in the transmission system, so lower electricity tariff.

Case Study II (3)

Consequently, the Ministry of Energy comes up with a new proposal on the new power plant using 'cleaner coal' from Indonesia and Australia.

Concerning the business and industrial sector in the province, they support any proposals for increasing electricity generation. But the investment in the province may be better than the expansion of the plant in another province.

The local people affected by the existing coal plant, NGOs, and academics strongly oppose the expansion of the existing lignite power plant. Apart from many impacts, the local people also worry about the 'Holy' pagoda, the most respected pagoda in the area, which may be affected by the expansion of the lignite mining. Moreover, the 'cleaner coal' power plant project is not the option also, based on the experiences of the same kind of power plant in the Philippines.

They propose the use of various renewable energy sources. These are, for example, rice husk from many rice mills - both large and small scale - pig and chicken farms, palm oil factories. Furthermore, waterfalls and canals in the mountains and wind along the coast can provide electricity for local villages. Also, solar energy should be developed even though the cost is higher. In addition, a number of communities have started Local Energy Planning to learn about the problems and their potential concerning renewable energy. But these are more concerned with wood, charcoal, and energy saving, not directly about electricity generation.

Energy efficiency and energy saving are important and need more implementation and campaigning. The Co-generation system, used in the existing sugar mills, should be expanded to other factories as well.

However many other groups of local people strongly support the investment on new coal power plant; because this will bring about economic development, at the local, provincial, and national levels. Conflicts within and between local communities are more and more intense.

Moreover, the government and electricity authorities have tried to provide information that renewable energy is more expensive than coal and gas, and therefore they may have to increase electricity tariff. In addition, renewable energy cannot provide enough electricity for the growing demand.

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Case Study III (1)

HEALTHY TRANSPORTATION?:

Local Transportation Alternatives in Chiang Mai

(Note: The information here has been adapted for the purpose of HIA training, please do not quote for analysis of actual situation of Chiang Mai)

Chiang Mai is the most well-known historical city and tourist attraction in Thailand. Several hundred years old Buddhist temples are located on the inner parts of the city, or the old town. The business, hotel, and trading areas scatter around the city, including the inner part, while nature tourist spots are located outside the city.

For longer than a decade, Chiang Mai has grown very fast, sprawling outward. Hundreds of real estate projects have been developed in the outer part of the city. These new communities are connected to the city by new big roads and outer ring roads. In the inner city high rise buildings, mainly hotels and condominiums have mushroomed in recent years leading to over crowded problems, including traffic jams during the rush hour.

Present Situations

The public transportation in Chiang Mai is very limited and inconvenient for both local people and tourists. Most people depend on small red pick-up trucks and their personal cars and motor-cycles. For people who live outside the inner part, they mainly rely on cars and motor-cycles. Relying heavily on cars and motorcycles has caused an increase in traffic accidents, especially for the young male (18-30 years).

Other concerns have been raised by Chiang Mai citizens. Air pollution locally has continually worsened due to a number of causes including traffic increases, burning of agricultural waste outside the city, and Chiang Mai's own location as a valley city which blocks the natural air flow during summer. The number of people affected by respiratory disorders is unsurprisingly increasing. Moreover, the ratio of lung cancer in Chiang Mai is also increasing and, more importantly, is now the highest in Thailand in recent years.

Traffic jams in the inner city also cause problems for pedestrians, both locals and tourists, mainly due to increased pollution and accidents. Local children cannot walk conveniently to the school and instead are driven in their parents' cars, which leads to a reduction in physical exercise for them. Social cohesion in local communities has also been negatively affected by the heavier traffic. Traffic has turned public spaces in several Buddhist temples into private parking lots. A concern over the effect of traffic on the historical sites has been raised also.

Initiatives

Various policy initiatives have been raised in Chiang Mai. Several new roads, road expansions, tunnels for junctions, and pass-overs have been constructed and planned. However, this conventional approach has little to add to the inner part of city except to build up private parking lots in some areas.

As an alternative, improving the public bus system has been suggested to reduce local reliance on private vehicles and the inconvenience of using the small red pick-up trucks. Several routes have been planned, with the support from local communities and civil society organizations.

However, this initiative has not developed without opposition. The cooperative of small red pick-up truck drivers strongly oppose this initiative and have raised their concerns over the effects of the bigger public buses on the historical sites along the bus routes. They have bargained to avoid the public bus routes to service in the inner part of the city. Finally, the public bus system has been developed moderately, with only four routes. Therefore, local people still cannot rely on the existing public buses.

At the same time, the Thai government is also interested in building a sky-train system in Chiang Mai. Some feasibility studies have been made. The feasibility studies showed great concern over the economic cost of the train, while local people are afraid of the trains effect on their historical sites, spiritual places and Chiang Mai scenery. Lately, the idea has changed to be oriented to light-train or on-ground tram systems instead.

For tourist reasons, walking streets and bicycle ways have been initiated. Two week-end walking streets have become the newest tourist spots in Chiang Mai, especially helping the presentation of (and shopping for) local arts, handicrafts, and music performances. Bicycle ways have been developed for some historical places, such as the old historical city of Chiang Mai. However, both walking streets and bicycle ways have not yet implemented for everyday living. Some civic groups are trying to promote the health benefits of walking and cycling, but only little progress can be made at policy level.

The Political Situation

Politically, nothing is clear for Chiang Mai so far. During Thaksin government (2001-2006), Chiang Mai received higher attention and huge resource allocation for infrastructure projects (Note: Chiang Mai is Thaksin's home town and his strongest political base). However the present change of the Thai government may financially effect to development of Chiang Mai city. However, as Chiang Mai is the most well-known tourist city in Thailand, the city is expected to receive a fair resource allocation for its development.

The bargaining power of different groups in Chiang Mai is also an important factor in the policy process. The cooperation of small red truck drivers is part of the Mayor's main political network. However, the voices of civic groups and middle class people are becoming louder. More and more evidence presents a worse situation for both environmental quality and health status in Chiang Mai. Certainly, the pressure from tourists and tourist businesses over existing inconveniences is powerful.

The elections of Chiang Mai Municipality and Provincial Administration will occur in 2007. Moreover, the national general election (or MP election) is expected to occur then also. Several potential candidates have started to express and discuss their ideas to solve the transportation issue and its related problems in Chiang Mai. Clearly the existing Mayor and the president of Provincial Administration are required to do something more concretely and quickly to protect their positions in these coming elections.

Question: Given this situation in Chiang Mai, how HIA can make a good contribution to the process of identifying or developing healthier policy directions for Chiang Mai people?

3) The Training Activities and Processes

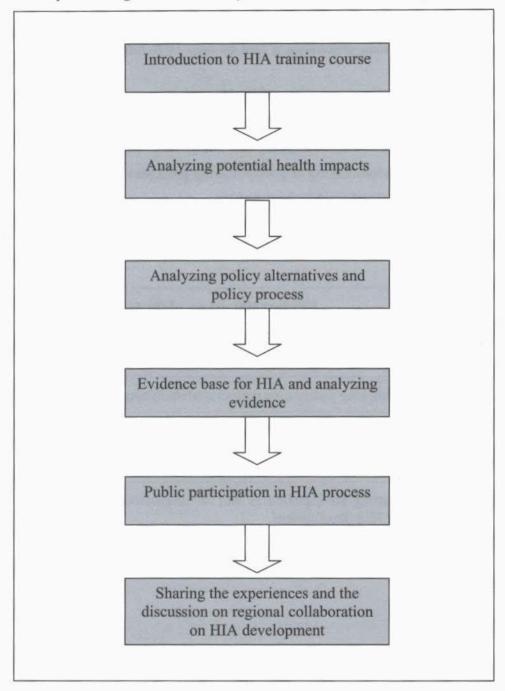
This training course has been decided to emphasis tackling key practical difficulties in HIA implementation rather than describing a step-by-step HIA training. These key practical difficulties include;

- 1) Different perspectives on health and health impacts;
- 2) Lack of clear appropriate policy and project alternatives;
- 3) Limited evidence and lack of appropriate analytical practices;
- 4) Influencing decision-making or policy-making processes;
- 5) Facilitating meaningful public participation.

The problem-based learning approach will be the main focus of the training. The key learning issues in each day of the training course are depicted as the following:

Day Key learning issues of the training course		
Day I	Introduction to HIA training course and analyzing potential health impacts	
Day II	Analyzing policy alternatives and analyzing policy process	
Day III	Evidence base for HIA and analyzing evidence	
Day IV	Public participation in HIA process	
Day V	Sharing the experiences and the discussion on regional collaboration on HIA development	

Key Learning Issues for 5 Days Interactive HIA Training Course



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DAY I: Introduction to the HIA Training Course and Analyzing Potential Health Impacts

Training Objectives

- To expand comprehension of HIA principles and to clarify the importance of the training approach
- To enhance understanding of different health paradigms and perspectives on health impacts
- 3) To analyze and identify potential health impacts of the case studies provided

Key Learning Issues

The key learning issue of the first day of the training is to enhance understanding of HIA principles, which will include necessity of HIA, practical difficulties in HIA implementation and the steps of HIA. In addition, understanding health paradigms and different approaches to analyze potential health impacts will be considered and discussed during group work. These issues are the basis for successful implementation of HIA.

Learning Approaches

The learning approaches during the first day of the training are briefly described as the following:

- Introduction to the training course
- Lectures on introduction to HIA
- Lectures on the key steps of HIA
- Lectures on understanding of health impacts and analyzing of potential health impacts
- Group work

Introduction to the training course



The training will start with the trainers welcoming all participants to the HIA interactive training course: a learning tool for healthy communities and societies. Following this the training objectives are clarified to the participants. After that the trainer invites each participant to introduce themselves (name and organization; overall summary of his/her responsibilities and works; and how these may relate to HIA; and their expectations from the training course). Then an overview of the training course is

provided including the tentative schedule and introduction to field visits will be described to the participants respectively.

Introduction to HIA and key steps of HIA

After the introduction to the overview training course, the introduction of HIA principles will be presented to the participants. As each participant comes from different disciplines and work experiences, mutual understanding on HIA principles is necessary for the success

of this training course. Moreover, this training approach is different from other HIA training, which tend to focus on step-by-step HIA training. However, this does not mean that step-by-step is less effective than other approach. On the contrary, step-by-step approach is very useful and necessary. Thus, the key steps of HIA will be considered after the introduction to HIA.

The main contents of this session comprise of the following issues:

Contents of introduction of HIA

- Globalization and health
- Healthy Public Policy and Health Impact Assessment (HIA)
- HIA and health promotion
- Methodological development
- Underpinning principles of HIA
- HIA and policy-making
- HIA institutionalization and HIA as a social learning process
- Platforms for HIA development
- Practical difficulties in HIA
- Introduction to training approach

Contents of key steps of HIA

- Defining HIA: What is important?
- When do you do HIA
- The steps of HIA
- Where does health risk assessment fit?



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On the steps approach

Understanding of health impacts and analyzing of potential health impacts

One of the key practical difficulties in implementing HIA is different perspectives on health and health impacts. Since a range of health paradigms is diverse, thus it is necessary to understand the differences of health perspectives which are mainly employed in HIA study. Without clear understanding of health perspectives, HIA practitioners will come across with a number of difficulties in implementing HIA. Therefore, this session will emphasis on understanding of health perspectives and health impacts, including analyzing of potential health impacts.

The main contents of this session consist of the following issues.

- What is health?
- Determinants of health
- Approach to understand health impacts
- Dimensions of health impacts

Group Work

After finished the lectures, each group is assigned to work on Task I: analyzing potential health impacts. Within each group, an overview picture of the case studies will be briefly explained to the group members by the training staff. The main tasks for each group are to explore and analyze potential health impacts of their case studies. Each group has to discuss the following questions:







Task I: Analyzing potential health impacts

- What are determinants of health in your case study?
- What are potential health impacts in your case study?
- Prioritize five potential health impacts in your case study.

Before starting group work, each group chooses a chairman and a secretary to facilitate the discussions within the group, to take notes and to present the result of the group discussion to the others.

The key principle for group works is that everybody is an active participant who is enthusiastic and wants to share ideas and discussion about the given questions according to their existing knowledge and related work experiences. This meaningful participation will be very crucial for the success of this training approach.

DAY II: Analyzing Policy Alternatives and Policy Processes

Training Objectives

- 1) To enhance understanding on different levels and dimensions of policy alternatives
- To extend comprehension on public policy processes and develop an appropriate framework for public policy analysis
- To identify healthier options for policy recommendations and analyze the public policy processes of the case studies provided.

Key Learning Issues

The importance of HIA is not only to show impacts of a project or policy proposal, but to also assess the health impacts of various alternatives. Moreover, understanding of public policy processes is also crucial when applying HIA to promote healthy public policy. Without clear understanding of public policy processes, HIA implementation may be less effective. Therefore, the key learning issues of the second day of the training are the understanding of different levels and dimensions of policy alternatives, including comprehensive policy analysis. These issues are vital for HIA practitioners as it will help to strategically analyze and identify the healthier policy options, which is very significant for influencing policy decision-makers to promote healthy public policy development.

Learning Approaches

The learning approaches of the second day of the training comprise of the following activities.

- Lectures on analyzing policy alternatives
- Lectures on analyzing policy process
- Group work
- Filed visit I

Analyzing Policy Alternatives

Normally when conducting HIA, HIA practitioners mainly assess only the impacts of a project or policy proposal. Most of HIA studies put a lot of efforts to proof the health impacts and their significance, but when it comes to solutions and policy suggestions they can provide only the ideas for policy recommendations. This is not enough to lead to healthier options and healthy public policies. The key learning issue of this session thus will be focus on the understanding of analyzing policy alternatives and policy options. The main contents of this session are:

- Levels of policy alternatives
- Dimensions of policy alternatives.

Analyzing Policy Process

In the real world, understanding of public policy processes is very important when applying HIA to promote healthy public policy. To gain more insightful understandings about public policy process, this section will explore deeply into the relevant theoretical

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grounds. A more comprehensive policy analysis framework for HIA is also expected to be the guidelines for HIA practitioners.

Group Work

Task II: Analyzing policy alternatives

After finish lecture on analyzing policy alternatives, each group will be assigned to do exercise on Task II which is analyzing policy alternatives. Each group will continue work on the same case provided yesterday. The main questions for group discussion in task II is:

What are policy alternatives in each case?

Task III: Analyzing policy options and public policy process

Group work on task III will be followed after the trainer finish lecture on analyzing public policy process. Each group has to discuss their case studies in order to answer the following questions:

- What are your policy options (2-5 options)
- What are your policy conditions (or conditions of decision-making process)? For example, critical points for intervention, timing
- What are your policy windows or opportunity?
- What are policy networks who should be involved in HIA process? And how?
- What are the main policy consideration points or issues in your case? (both health and other impacts and consequences)

Field Visit I: New Sunshine Community: A case of participatory urban community planning

The main objective for this field visit is to see and learn about inspiring experiences related to HIA and the movement of healthy urban development at the local level. For the first day of the field visit concerns 'the New Sunshine Community: A case of participatory urban community planning'. The case study located at Muang district, Khon Kaen province, northeastern Thailand. The key learning issue from this field

visit is the participatory process of the community to manage the housing scheme for the poor.

DAY III: Evidence Base for HIA and Analyzing Evidence

Training Objectives

- To understand differences in evidence from different disciplines using in HIA study
- To apply different types of evidence and method suitably when conducting HIA
- To analyze suitable evidence for the case studies provided

Key Learning Issues

Evidence is very important in HIA, since it determines the outcomes of HIA and the creditability of these policy recommendations. Evidence base for HIA and analyzing evidence, therefore are the key learning issues for the third day of the training. In this section, different types of evidence and method will be presented and discussed, in order to provide the idea for HIA practitioners on what is suitable for their specific purposes.

Learning Approaches

The learning approaches during the third day of the training will comprise of the following activities and processes.

- Lectures on the evidence base for HIA
- Lectures on analyzing evidence in HIA
- Group work
- · Field visit II

Evidence base for HIA and analyzing evidence in HIA process

Normally, HIA tries to systematically collect data on the impacts of policies, programs and projects and facilitate the discussion and conclusion on the balance between benefits and

harms within a human health perspective. Analyzing evidence in HIA process is, therefore important for HIA practitioners. This section will focus on the following issues:





- What is evidence?
- Why do we need evidence in HIA?
- What are the special features of evidence for HIA?
- When do we use evidence?
- What types of evidence do we use?
- How do we use the evidence?
- Challenges

Group Work

Task IV: Analyzing evidence in HIA process

After finish lecture on evidence base for HIA and analyzing evidence in HIA process, each group will be assigned to do exercise on Task IV which is analyzing evidence in the HIA process. Questions for group discussion are as the following:

- What are appropriate ways to get essential evidence for your case?
- What should the triangulation strategies be?

Field Visit II: Healthy Agriculture at Community Level: A Case of Baan Dong Sub-district

The main objective for this field visit is to see and learn about inspiring experiences related to healthy agricultural policy movements at local level. For the second day the field visits concerns 'healthy agriculture at the community level: a case of Baan Dong sub-district', Ubonrat district, Khon Kaen province. The key learning point of this case is the learning process employed by the community to tackle the problems associated with poverty. Development of sustainable agriculture on the basis of sufficient economic is very crucial for poverty reduction at the community level.





DAY IV: **Public Participation in HIA Process**

Training Objectives

- To understand principles and practices of public participation in HIA
- To analyze and identify key stakeholders, appropriate methods and processes of public participation in HIA process of the case studies provided

Key Learning Issues

Public participation in the HIA process is very important as it can contribute to the transparency of decision-making. Furthermore, it can serve as a mechanism to manage social conflicts by bringing different stakeholders and interest groups to the same table to discuss the issues. Thus, principle understanding of public participation will be the key learning issue for the fourth day of the training.

Learning Approaches

The learning approaches of the fourth day of the training are as of the following activities.

- Lectures on public participation in HIA process
- Group work
- * Presentations of the selected issues for future HIA studies in the neighboring countries

Public participation in HIA process

Public participation in HIA process is linked with citizen rights to raise their concerns, share information and discuss on positive or negative impacts from a project or policy proposal that may be directly or indirectly affected their lives. Meaningful public participation is crucial for the success of HIA application to promote healthy public policy. The main focus of this session is thus on principles and practices of public participation in HIA process. The following issues are expected to be learned in this session.

- Why public participation in HIA?
- Who are the participating public?
- What are the roles of local community in HIA?
- What actions are needed for public participation?
- * When should public participation be integrated in the HIA and decision-making process?
- How should health authorities and experts be involved in the HIA process?
- How to identify the public who are interested in HIA?
- How to communicate to the relevant public?
- What should the information be consisted of?
- What is the management capacity essential for public participation?
- What kind of evaluation is needed for the public participation process in HIA?

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Group Work

Task V: Public participation in HIA

After the finish of the lecture on public participation in HIA process, each group will be assigned to do exercise on Task V: public participation in HIA. Questions for group discussion are as the following:

- Who should be involved in the HIA process?
- What should be the appropriate methods and media?
- When should be involved and how?
- Who should be the facilitator or assessor?
 - Presentations of the selected issues for future HIA studies in the neighboring countries

This session is the opportunity for the participants to get the information on the potential issues for HIA from different countries and discuss the ways for applying the HIA in each case.

The three issues are selected in consultation with the participants from three countries and they also prepare the paper on each issue. The three issues are as follows:

- 1. Industrialization and Urbanization in Vietnam;
- 2. Water Supply and Sanitation and Community Health in the Lao PDR; and
- 3. Aquatic Resources and Health in the Lower Mekong Basin.

DAY V:

Sharing the Experiences and the Discussion on Regional Collaboration for HIA Development

Training Objectives

- To share the information and experiences on HIA practices and development in the neighboring countries
- To discuss and develop the network for regional collaborations on HIA development with the aim to promote healthy public policy in Southeast Asia

Key Learning Issues

Sharing information and experiences on HIA practices and development is very important for HIA practitioners to broaden their understanding and knowledge on HIA implementation in different contexts and on different issues. Furthermore, expanding of HIA networks is also important as it helps HIA practitioners to search for the possibilities and opportunities to development strategies for working collaboration for HIA development, particularly among the neighboring countries. Thus, the key learning issue for the last day of the training is the focus on sharing experiences on HIA practices and future development of an HIA network in the Southeast Asia.

Learning Approaches

The learning approaches of the last day of the training are presented as of the following activities.

- Presentations and brainstorming on HIA development plan for regional collaboration
- Discussion on regional collaboration on HIA development
 - Presentation and brainstorming on HIA development plan for regional collaboration

Three presentations on the HIA development and the ideas for regional collaboration from Lao, Vietnam, and Thailand are prepared for this session. These are followed by the presentation about the regional collaboration program. The activities and the ideas for future collaboration under the program are presented and discussed.

Brainstorming and planning for regional collaboration on HIA development

The last session is to brainstorm all possibilities and options for regional collaboration on HIA development. These ideas are discussed and synthesize to form a more concrete plan of action for future collaboration.