THAI TRADITIONAL AND ALTERNATIVE HEALTH PROFILE :

Thai Traditional Medicine, Indigenous Medicine and Alternative Medicine 2014-2016

Technical and Planning Division
Department of Thai Traditional and Alternative Medicine
Ministry of Public Health



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Office of Information and Knowledge Bank
Department of Thai Traditional and Alternative Medicine
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Preface

The Department of Thai Traditional and Alternative Medicine (DTAM), Ministry of Public Health (MoPH), through the Office of Information and Knowledge Bank, has prepared **"Thai Traditional and Alternative Health Profile, 2014–2016"** with the collaborative efforts of relevant experts and representatives of agencies concerned. It is believed that this report will be useful for further knowledge creation, service system development, herbal drug system development, and the formulation of policy and direction for further development of Thai traditional medicine, indigenous medicine and alternative medicine. It is the third report of this kind of MoPH's Department of Thai Traditional and Alternative Medicine.

Thai Traditional and Alternative Health Profile, 2014–2016, contains seven chapters on important matters as follows:

1. Challenging Directions in the Development of Thai Traditional Medicine
2. Thai Herb Development for Thai Health Stability and Economic Sustainability
3. Thai Traditional and Alternative Medical Services Systems
4. One Decade of Thai Indigenous Medical Knowledge Management
5. Situation of the Thai Traditional Medical Knowledge Protection in Thailand
6. International Cooperation on Traditional, Indigenous and Alternative Medicine
7. Thai Traditional Medicine Reform for Sustainability

The Department of Thai Traditional and Alternative Medicine would like to thank the experts, academics, and officials of responsible agencies for their kind contributions to this report, particularly regarding data analyses and syntheses for generating its content. We are hopeful that this report will be useful for further development of Thai traditional, indigenous and alternative medicine, and expect that it will used as a reference in this field at both national and international levels.



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Acronyms and Abbreviations

ADR	adverse drug reaction
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Area
AHMeN	APEC Herbal Medicine Research and Information Network
AHMM	ASEAN Health Ministers Meeting
AIDS	acquired immune deficiency syndrome
AM	alternative medicine
APEC	Asia-Pacific Economic Cooperation
APSC	ASEAN Political-Security Community
ASCC	ASEAN Socio-Cultural Community
ASEAN	Association of Southeast Asian Nations
ATM	applied Thai traditional medicine
ATFTM	ASEAN Task Force on Traditional Medicine
AWGPD	ASEAN Working Group on Pharmaceuticals Development
B.E.	Buddhist Era (A.D. 0 = B.E. 543)
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BMA	Bangkok Metropolitan Administration
BMTM	Bachelor of Myanmar Traditional Medicine (or B.M.T.M.)
BNNCTM	BIMSTEC Network of National Centers of Coordination in Traditional Medicine B.CM. Bachelor of Traditional Chinese Medicine (or BCM)
B.TM.	Bachelor of Thai Traditional Medicine (or BTM)
B.ATM.	Bachelor of Applied Thai Traditional Medicine (or BATM)
CAGR	compound annual growth rate
CAM	complementary and alternative medicine
CBD	Convention on Biological Diversity
CBD-COP	Conference of the Parties to the Convention on Biological Diversity
CBR	Community Biodiversity Registration
CH	community hospital
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPG-TM	clinical practice guidelines for Thai traditional medicine
CPG-TMS	clinical practice guidelines for Thai massage
CSMBS	Civil Servant Medical Benefit Scheme
CUP	contracted unit of primary care
DHSS	Department of Health Service Support, MoPH
DMSc	Department of Medical Sciences, MoPH
DTAM	Department of Thai Traditional and Alternative Medicine

ED	essential drugs
EU	European Union
FDA	Food and Drug Administration
FDA	Food and Drug Administration
FRMO	Forest Resource Management Office
FTA	free trade agreement
FY	fiscal year
GACP	good agricultural and collection practice
GAP	good agricultural practice
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GCP	good clinical practice
GDP	gross domestic product
GH	general hospital
GI	Geographical Indication
GLP	good laboratory practice
GMP	good manufacturing practice
GMS	Greater Mekong Subregion
GPO	Government Pharmaceutical Organization, MoPH
GR	genetic resources
GRRF	Genetic Resources Recognition Fund
GRTKF	genetic resources, traditional knowledge and folklore
HDC	Health Data Centre
HPVC	Health Product Vigilance Centre
HS	harmonized system
HSRI	Health Systems Research Institute, MoPH
ICD-10-TM	International Statistical Classification of Diseases and Related Health Problems, 10th revision, Thai Modification
ICT	information and communication technology
IGC	Intergovernmental Committee on Intellectual Property, Genetic Resources, Traditional Knowledge and Folklore (under WIPO)
IM	indigenous medicine
INN	Individuals, Nodes, and Networks
IPC	International Patent Classification
IPR	intellectual property rights
ISO/TC249	International Organization for Standardization Technical Committee on Traditional Chinese Medicine
ITB Berlin	International Travel Trade Show in Berlin
ITM	Institute of Traditional Medicine (Lao PDR)
ITTM	Institute of Thai Traditional Medicine

JNTBGRI	Jawaharlal Nehru Tropical Botanic Garden and Research Institute (India)
JPO	Japan Patent Office
KOTRANAS	traditional Indonesian medicine (or Jamu, in Indonesia)
LGO	local government organization
MCH	maternal and child health
MDNS	Michigan diabetes neuropathy score
M&E	monitoring and evaluation
MFA	Ministry of Foreign Affairs
MoPH	Ministry of Public Health
MTA	Standardized Material Transfer Agreement
NCD	non-communicable disease
NCTM	National Research Center of Traditional Medicine
NESDB	National Economic and Social Development Board
NGO	non-governmental organization
NHA	national health assembly
NHCO	National Health Commission Office
NHSO	National Health Security Office
NICE	National Intellectual Property Rights Centre of Enforcement
NLEM	National List of Essential Medicines
NRCT	National Research Council of Thailand
NRMN	National Research Management Network
NSS	neuropathy system score
NSTDA	National Science and Technology Development Agency
OHEC	Office of the Higher Education Commission
OP	outpatient (in OP Individual Database)
OPD	outpatient department
OPS	Office of the Permanent Secretary, MoPH
OTOP	One Tambon One Product
PAO	provincial administrative organization
PAR	participatory action research
PCMO	provincial chief medical officer
PCU	primary care unit
PHC	primary health care
PIC	prior informed consent
PIC/S	Pharmaceutical Inspection Co-operation Scheme
PMAS	post-marketing alert system
PPP	public-private partnership
PPSTI	*APEC's* Policy Partnership on Science, Technology and Innovation
PWG TMHS	Product Working Group on Traditional Medicines and Health Supplement
R2R	routinee-to-research (R2R)

R&D	research and development
RH	regional hospital
SAHM	Standard of ASEAN Herbal Medicines
SEARO	South-East Asia Regional Office (WHO)
SOMHD	Senior Officials Meeting on Health Development
SIPO	State Intellectual Property Office, China
SSS	Social Security Scheme
TAO	*tambon* (subdistrict) administrative organization
TBA	traditional birth attendant
T&CM	traditional and complementary/alternative medicine
TCE	traditional cultural expression
TCM	traditional Chinese medicine
T/CAM	Traditional/Complementary & Alternative Medicine
TM/CAM	traditional medicine and complementary/alternative medicine
ThaiHealth	Thai Health Promotion Foundation
THP	Thai Herbal Pharmacopoeia
THPH	*tambon* (subdistrict) health promoting hospital
TIPhS	Thai Traditional Medicine & Integrative Medicine Promoting Hospital Standard
TK	traditional knowledge
TK & GRs	traditional knowledge and genetic resources
TMRI	Thai Traditional Medicine Research Institute
TP	Thai Pharmacopoeia
TPP	Trans-Pacific Partnership
TRF	Thailand Research Fund
TRIPS	trade-related aspects of intellectual property rights
TTDKC	Thai Traditional Digital Knowledge Classification
TTDKL	Thai Traditional Digital Knowledge Library
TTM	Thai traditional medicine
UHC	universal health coverage
UCS	Universal Health Coverage Scheme
UNESCO	United Nations Education, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UPOV	Union for the Protection of New Varieties of Plants
USA	United States of America
USD	U.S. dollars (1 USD = approx. 34 Thai baht)
USPTO	U.S. *Patent and Trademark Office*
VTM	Vietnamese traditional medicine
WCCTM	WHO Collaborating Centre for Traditional Medicine
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Chapter

1

Challenging Directions in the Development of Thai Traditional Medicine

Thai traditional medicine (TTM) has been seriously revived and developed for nearly two decades after the TTM body of knowledge was created about 300 or 400 years ago, but for many years in the past the TTM services were neglected and excluded from the Thai public health service system. At present, TTM has been recognized as part of the health-care system and a good alternative for health care and also as a health-care profession. However, the move towards TTM development has been rather slow because a number of obstacles have not been overcome, and its development policies and directions were merely concepts in principles, lacking clear and concrete strategies.

According to literature reviews, fact synthesis and meetings with various agencies while the author was director-general of the Department of Thai Traditional and Alternative Medicine (DTAM, formerly Department for Development of Thai Traditional and Alternative Medicine) in fiscal year 2016, significant findings related to TTM development are three pillars: the knowledge, professional personnel, and service system. Thus, extensive reviews were undertaken and recommendations were made on systematic management for TTM development in an efficient manner, and for the improvement of the department's working system.

1.1 Three pillars in the development of Thai traditional medicine

1) Knowledge of Thai traditional medicine

Even though TTM development has been undertaken for hundreds of years and over the past 20 years, the revival efforts of TTM and applied TTM have been carried out, in conjunction with the compilation of knowledge and textbooks. But due to the fact that there are several basic features of TTM knowledge, which are scattered and diverse according to each local situation, it is necessary that TTM development be carried out based on acceptable criteria and standards. In the past, TTM practitioners or doctors chiefly used their own judgements in providing treatment, while some knowledge features were based on each practitioner's personal experience. Besides, over 14,000 collected national TTM formulas or recipes have not been grouped and classified as to which ones should be recognized as Core Formulas of the country; and how many of them are in such groups. So the first challenging question is the TTM knowledge pillar.

If such bodies of knowledge are still scattered in various TTM educational institutions, TTM masters or teachers, or indigenous (folk) healers, without standardizing the knowledge, the TTM development will not cross over the personnel limitation. Thus, this major problem of TTM development has to be resolved.

For example, in the People's Republic of China, traditional Chinese medicine (TCM) has had a longer history than TTM, as China is a vast country with a large population, there are several branches of TCM with hundreds of thousands of national and local TCM formulas. Over the years, China has tried to develop TCM standards, in terms of formulas and processes. Regarding TCM knowledge development, efforts have been made to create specificity or making certain standards clearer, such as tongue examination; 12 groups or 16 characteristics of tongue have been created, so that the tongue characteristics can be clearly differentiated, minimizing the healer's discretion.

At the moment, efforts have been made to develop the standards of TTM knowledge involving two major issues, i.e. central drug formulas, or "National Thai Traditional Formulary", and Thai therapeutic massage. And the DTAM began

implementing the National Thai Traditional Formulary Development Project and formulating strategies for Thai massage (Thai identity) development.

The term **"National Thai Traditional Formulary"** means standardized drug formulas based on the Thai traditional medicine principles for use in treating illnesses. As the DTAM has registered more than 14,000 formulas according to the Thai knowledge or wisdom protection law, it will revise all such formulas and designate central drug formulas within three years – probably including 300–500 formulas or more. The National Thai Traditional Formulary will be used in developing the National List of Essential Medicines and the Thai Herbal Preparation Pharmacopoeia, supporting drug production, undertaking further development, and registering Thai traditional medicines. The Formulary is also useful when making references to quality standards.

Regarding the Thai Herbal Preparation Pharmacopoeia, the DTAM has initiated its preparation for the first time for it to be the standards for quality examination in a laboratory of Thai drug formulas. It will also be used as a reference at the international level. For example, when a private company wants to produce a drug, the producer can exhibit the drug's quality as to whether the formula is in line with that in the central drug formulas and the Thai Herbal Preparation Pharmacopoeia. That will help speed up the Thai drug registration process; and if any drug company wants to register such a drug overseas, its reference can be made to the Thai Herbal Preparation Pharmacopoeia.

As for Thai massage, further studies as well as standard development are required, aiming to develop "Thai Therapeutic Massage". According to the Thai traditional massage principles, the records show only the ten primary energy lines (*sen prathan sip*), but a knowledge analysis has shown the use of only one group of energy line, while the other nine groups lack a serious study. Besides therapeutic massage, which is part of the Thai traditional medicine profession, and it needs further development to become a specialty, emphasizing career advancement and separating it from massage for health promotion. Overall, it is also necessary to have a strategy for Thai massage development in a systematic manner.

2) Thai traditional medicine professions

The TTM professions have undergone a development process for several decades. Many agencies have helped improve the professions of TTM personnel, especially Prof. Dr. Ouay Ketusingh and Dr. Pennapa Subcharoen, who played key roles in initiating the development programme of applied Thai traditional medicine and made it a profession. A major change occurred when the Thai Traditional Medical (TTM) Council was established according to the Thai Traditional Medical Professions Act, B.E. 2556 (2013), creating TTM professions. However, there is a challenging problem of the development of TTM expertise.

The aforementioned challenge is related to educational limitations. Even though there are 27 educational institutions producing TTM workforce at the bachelor's degree level, using their four-year programmes, such study period is insufficient for quality development and the enhancement of professional experience and skills. This is because, naturally, Thai traditional medicine is learned from experience. So upon graduation, such personnel have gained only theoretical knowledge, but they lack the capacity and skills to apply the knowledge to appropriately treat patients.

Importantly, many TTM personnel still lack the skills in working together with other professions as the TTM science has got its own theory and technical terms. For example, TTM diagnostic methods, medication, and disease analysis and verification are different from those in modern medicine. Therefore, with the differences in basic professional features and the lack of linkages, there is a gap between modern medical and TTM practices, leading to concerns over TTM personnel working in a their own departmentalized setting, not integrated with modern medical doctors and other multidisciplinary team members. And then other professions would not understand how TTM practitioners work.

Thus, the challenges in TTM professional development involve not only making TTM personnel understand such limitations to resolve the problem of communications and to create understanding between TTM professions and the multidisciplinary team, but also raising TTM professional standards, skills and expertise.

3) Thai traditional medical service system

At present, the situation of TTM services has been significantly better than before. Many agencies have recognized TTM services as alternatives for health care. Nearly 90% of state or government hospitals in various cities/towns have opened a TTM clinic, but there are limitations in terms of service diversity as most of them focus on Thai massage service, without specifying whether it is massage therapy or massage for health promotion. Besides, TTM services do not have expertise for any specific illnesses, resulting in the lack of diversity of TTM practitioners or service processes.

Even though in recent years there have been efforts to integrate TTM with mainstream or modern medicine and the DTAM has set up a policy to open a TTM outpatient department (OPD) at each of the regional, general and community hospitals across the country, in parallel with modern medical outpatient departments, the gap has just partly narrowed. That is due to the fact that caring for a patient does not fall within the responsibility of any particular department or unit of the hospital; rather, such care requires an integrated effort of traditional and modern medical personnel. However, there is still some misunderstanding between the two disciplines.

Therefore, both Thai traditional and modern medical service systems have to complement or lean on each other's weaknesses and strengths. The TTM science focuses on the body balance in the proper functioning of various organs as it is believed that all organs are interconnected, be it the balance of the four body elements (*tard* in the Thai language), physical and mental balance, balanced diet, and organs' functions. However, the TTM science lacks specificity, for example when dealing with diagnosis and medication (broadly mentioning drug property). These are the weaknesses and strengths of Thai traditional medicine.

While mainstream medicine, on the contrary, has strengths regarding specificity for diagnosis and treatment, clarity in anatomy and surgery, and details to the extent that modern technologies have been developed for use such as certain drugs for certain germs or organs. But modern medicine's weaknesses are the lack of tools or processes to deal with the body balance resulting in adverse reactions from synthetic drugs. For example, in a cancer patient receiving chemotherapy and radiation therapy, modern medicine cannot take care of the whole body, as it can

only provide advice and encouragements. In such instance, the patient's various systems are affected by chemotherapy and there is no medication to re-balance them. This is where Thai traditional medicine can help, using its expertise and confidence in ensuring that it can be more effective than modern medicine.

Having analyzed the aforementioned issue, the DTAM has proposed that TTM expertise be placed on four diseases – migraine, allergies, knee osteoarthritis, and stroke (paresis/paralysis) – which are chronic conditions that cannot be treated with modern medication. Meanwhile, attention has to be drawn to the care for body balance, especially in patients with allergies; so TTM science can effectively treat such illnesses.

It is apparent that the use of Thai traditional medicine in treating diseases has to be selective for certain ailments, based on its expertise and being a complement to modern medicine for a certain time period. As the period that traditional medicine can get involved is important, particularly for a patient with knee osteoarthritis. In the early stage, rehabilitative care for the illness can be supplemented with Thai traditional medicine and massage, but in the late stage, the role of Thai traditional medicine will lessen.

Thus, the challenging directions in the service system development will involve the preparation of clinical practice guidelines (CPG) and standards for diagnosis, with clear methods and steps for treatment. Recently, the Ministry of Public Health (MoPH) has set up the Health Service Plan for improving TTM services in the health service system as well as the Thai Traditional and Alternative Medicine (TTM/AM) Group in each of the provincial public health offices. That is regarded as a major step in setting up a base at the provincial level or in hospitals for Thai traditional and alternative medicine to progress further.

1.2 Turning point of TTM development in the future

1) Policy on Thai herb development

Thai herbs have been important along with Thai traditional medicine as they are major ingredients of traditional drugs used in traditional medicine and pharmacy, and basically herbs have been used in TTM practice in treating illnesses. It is understandable that Thai drugs are on one of the routes of herbs, besides using herbs as food supplements, cosmetics, aromas in spas, and products for animals.

Three factors affecting herb development and major turning points include:

1.1) National Herb Policy Committee

At present, the development of Thai traditional medical wisdom or knowledge and herbs or medicinal plants has had a clearer direction than before due to increasing health awareness in Thailand and abroad. Never before have herbs and natural products been in high demand among consumers, and Thailand has high potential for herbal development and adding more value to its products. This is because of its biodiversity and supportive factors, but lacking a policy-level mechanism and a systematic management system.

The important mechanism is the movement at the policy level. Currently, the MoPH's Department of Thai Traditional and Alternative Medicine (DTAM), in collaboration with eight other ministries (Ministry of Agriculture and Cooperatives, Ministry of Industry, Ministry of Natural Resources and Environment, Ministry of Commerce, Ministry of Interior, Ministry of Science and Technology, Ministry of Tourism and Sports, and Ministry of Education), academic institutions, and private sector agencies has drawn up the First National Master Plan for Thai Herb Development, 2017–2021. Under the Plan, a **National Herb Policy Committee** will be established under the chairmanship of the Prime Minister, as specified in the new draft legislation on herbal products. That is regarded as a critical turning point as when there is a National Herb Policy Committee, the herb policy direction will be made clearer with systematic management, integrated efforts of various public and private agencies, and budget allocation for investment and promotion of herb development.

The reason for the establishment of the National Herb Policy Committee is, despite Thailand's having seriously developed herbal products for a long time, the uncoordinated actions of relevant agencies, the private sector growing by themselves without serious support from the public sector. Moreover, the broad structures for herb development are scattered resulting in supply-demand problems and other related problems such as the scarcity of raw herbs, lack of knowledge among farmers (about whom they would sell their products to), lack of raw material quality control, and lack of planting management system. While in the industrial sector or the herbal drug use sector, there has never been any serous analysis of the country's demand for herbal use in the production of drugs, food supplements, and cosmetics. Operators in such businesses are unaware of the needs and there is no research on development of quality products; and universities are unable to provide any technical service as expected, resulting in exaggerated advertising or claims of herbs and herbal products' properties because there are no systems for product quality inspection. As a result, the producers can easily take advantage of consumers, and implicitly the herbal products' reliability has diminished.

Recently, it has been found that the country's biodiversity and natural herbs have been used in producing many products, using the resources wastefully, resulting in lower values of Thai herbal industry. Mostly, the industries are of small scale, lacking modern production technologies, causing inability to compete in international markets. Compared with Western countries with strong herbal industries and growing herbal markets such as Germany, France, and the United States of America, whose users and consumers are knowledgeable about herbal product quality and selection, the producers have competed in developing their technologies for producing high-quality extracts and pure substances. Whereas Japan, China and India are market leaders in Asia, and if Thailand does not have any clear policy on systematic herb development, the Thai herb industry will be negatively affected, in terms of competitiveness and growth.

1.2) Laws on herbal products

Laws are important tools for herb development of the country. So far, herbal drugs including herbal drug formulas have been classified as traditional medicines and controlled under the Drug Act, resulting in difficulties in getting

herbal drugs registered due to the lack of research evidence scientifically proving their medicinal properties, qualities, efficacies, and safety. Whereas food products are classified as food according to the Food Act and cannot be stated as being body tonic, enhancing the body structure, or reducing risks for any illness. Both existing drug and food laws are a hindrance to the growth of the herb industry.

Drafting a Herbal Products Act B.E. ... will be the turning point that affects the growth of the Thai herb industry. According to the draft law, there shall be a "National Herb Policy Committee" and a "Herbal Products Committee" with mechanisms to play key roles, the definition of herbal products covering both Thai medicines and herb-derived products, the control of products according to product types, the opportunities for the notification of all herbal products rather than just registration, and many other aspects.

1.3) National Master Plan

The development of herbs of the country requires a clear strategy to be used as a direction for moving the herb development efforts – upstream, mid-stream and downstream. The MoPH and eight other ministries as well as other public and private agencies have drafted a First National Master Plan for Thai Herb Development, 2017–2021, which is ready to be submitted to the Cabinet for approval. The Plan contains four strategies as follows:

(1) Strategy for promoting the productivity of potential Thai herbs to meet local and international demands, developing organic agriculture, increasing the amounts of herbs as needed, and promoting herbal processing by community enterprises.

(2) Strategy for developing herb industry and marketing based on international standards, developing herbal product technology, creating the markets that are accessible to consumers, and promoting industrial production of extracts and pure substances.

(3) Strategy for promoting the use of herbs for treating illnesses and health promotion, developing herbal drugs with healing properties, good quality and safety, and developing standards for raw herbs, medicinal plants and Herbal Preparation Pharmacopoeia.

(4) Strategy for strengthening public sector administration and policy, importantly regarding the selection of herbal Product Champions and the development of research on the entire system, with a five-year budget of 5,000 million baht, including the development of essential information systems.

The three factors mentioned earlier will be the turning points that significantly affect herb development so that Thai herbs will be promoted and used extensively with diverse products, including single-herb and formulated drugs. Their qualities and standards, research and technologies will also be improved or undertaken so that there will be more exports of herbal products, creating additional values in the entire supply chain. Thus, the herb industry will be developed and nurtured systematically and continuously, positively affecting the overall agricultural and economic sectors of the country.

2) Development of research on Thai traditional medicine and herbs

Research on Thai traditional medicine and herbs is divided into two parts:

2.1) The search for Thai traditional medical wisdom or knowledge

Thailand has had the law on the protection and promotion of Thai traditional medical wisdom since 1999, which is regarded as a remarkably advanced and visionary legislation. Over 17 years of the enforcement of the law's wisdom protection provisions, many announcements or notifications have been issued to protect Thai traditional medicine textbooks of the nation from original documents covering more than 14,000 drug formulas. In addition, there have been surveys and registrations of personal textbooks, the notification of controlled herb *kwao khruea* (*Pueraria candollei* var. *mirifica* (Airy Shaw & Suvat.) Niyomdham), and the support for research studies as well as textbook preparation.

However, efforts to protect and promote Thai traditional medical wisdom have been undertaken rather slowly due to the lack of directions, targets and monitoring, especially for activities related to herbal plant varieties surveys and conservation, herbal source management in natural forest to prevent extinction due to one-sided exploitation, and the unclear guidance in the management of herbal

conservation areas, and the sharing of benefits gained from herbs at their original sources or the results of research on Thai herbs.

However, this year the "**National Thai Traditional Formulary Preparation Project**" has been launched to collect and examine more than 14,000 Thai traditional drug formulas that have been recorded in various textbooks and registered. Then the national formulary will be used as the central formulary of the country. Upon completion of the three-year project, Thailand will have the first National Thai Traditional Formulary for use as a reference in TTM teaching, learning and research, as well as for preparing the Thai Herbal Pharmacopoeia and producing Thai traditional drugs more extensively.

2.2) Research on Thai traditional medicine and herbs

Under the First National Master Plan for Thai Herb Development, 2017–2021, it has been proposed that the annual research budget be increased from 250 million baht to 1,000 million baht, on average, or a four-fold increase by the year 2021. An emphasis will also be placed on more coordination and integration of efforts among relevant agencies – the National Research Council of Thailand (NRCT), the National Agricultural Research Development Agency (ARDA), the Health Systems Research Institute (HSRI), the National Innovation Agency (NIA), and the Thai Traditional Medical Knowledge Fund.

Although a number of research studies on Thai traditional medicine and herbs in Thailand have been carried out for a long time, there are still some problems. Most of them are studies on single herbs, and some on drug formulas; very few are really on Thai traditional medicine. Among the herbal studies, most of them focused on basic drug actions such as phytochemistry, physiochemistry and pharmacognostic research; very little has been done on full-cycle herb development until obtaining an industrial product and reaching a clinical study stage.

Regarding the overall research and development framework, consultations have suggested that this matter be settled at the policy-making level to set the direction for research funding and appropriate or cost-effective use of resources, assignments of duties and coordination of efforts among several research funding and promotion agencies. Research management should be undertaken in four

major programmes to be in line with the overall goals of research programmes on herbal agriculture, herbs for health, herbal products and Thai traditional medical knowledge.

In this regard, the development of infrastructure such as researchers' networks, laboratories and equipment, and supportive information systems also needs to be promoted and supported.

1.3 The movement of Thai traditional medicine

The revival and progress of Thai traditional medicine have been achieved by the "Three Pillars" – knowledge, professional personnel, and health-care facilities. Scientific research and clear state policies on Thai herb development are the benefaction derived from the devotion and hard work of many parties that realize the importance of such efforts. However, the development of TTM knowledge, herbs, professional standards, and service quality standards during the next phase will not occur if the organizations directly responsible for such matters do not undertake a review of their past roles and jointly set development directions and goals – both short and long terms – and then improve the working efficiency of within each agency.

1) Department of Thai Traditional and Alternative Medicine

The DTAM, as the core agency in the development of Thai traditional medicine, has to initiate new roles in driving the policy and strategy for developing Thai traditional medicine and Thai herbs, rather than focusing on playing a technical support role to promote only Thai traditional medicine. The role adjustment involves the revision of concept and the understanding of a broad movement mechanism, including the revision of working procedures based on the strategic framework. And importance has to be placed on the study of information and facts as well as proactive operations, through cooperation in research and networking with various institutions including private agencies as mentioned before.

As for the development issues to which DTAM has to give importance, firstly, efforts should made on standards development, especially the knowledge on

such issue, adjustment of attitudes, perspectives and concepts on TTM professional practice (not segregating patients from other services), using the strengths of TTM in providing services together with modern medicine and the multidisciplinary team. Patient care should be provided together in a more balanced and holistic manner.

Secondly, Thai traditional medical wisdom covers the protection and promotion of traditional wisdom, and the protection has been extended to the wisdom of communities and juristic persons, the development of National Thai Traditional Formulary, the development of therapeutic massage using traditional knowledge, and the promotion of further development of Thai traditional medicine textbooks so that they have contemporary features, applying a lot of existing knowledge in relieving or healing symptoms and illnesses in today's society.

Lastly, regarding the development of Thai herbs, efforts focus on the actions described in the National Master Plan for Thai Herb Development. The implementation of the Plan is coordinated by DTAM, which serves as the secretariat of the National Herb Policy Committee; some of its functions have been previously mentioned.

2) Educational institutions and professional organization

The development of TTM workforce is the key role of TTM educational institutions in terms of workforce production and development. Such institutions have to urgently improve the quality of their TTM graduates and revise their concepts of workforce production. This is because, currently, educational institutions mainly focus on producing graduates in the quantities that are needed by the labour market, whereas the master's and doctoral degree levels in Thai traditional medicine emphasize academic and research studies, rather than developing expertise in the TTM professions.

Therefore, giving importance only to academic aspects is not the answer for Thai traditional medicine to progress steadily. But Thai traditional medicine including herb development needs a lot of research studies on illness treatment patterns, patient care standards, and Thai medicines including their healing properties. All such aspects need a strong and interconnected network of educational institutions, focusing on the development of research institutes and educational facilities that are working on TTM and herbal research.

With regard to the Thai Traditional Medical (TTM) Council, established according to the Thai Traditional Medical Professions Act, B.E. 2556 (2013), its key roles in TTM profession strengthening include the development of expertise in various branches, the revision of educational curriculums, and the development of Thai therapeutic massage. Currently, the Council's role in professional development is still unclear, besides the regulation of professional standards, which is its principal duty.

3) Committee on TTM Knowledge Protection and Promotion and TTM Knowledge Fund

The Committee on Thai Traditional Medical Knowledge Protection and Promotion was set up according to the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, under which the Committee is not empowered to set directions and strategies for TTM wisdom protection and promotion, or monitor the operations of the TTM Knowledge Fund. Rather, the Committee's roles mainly involve the issuance of notifications on the protection and development of TTM knowledge. Moreover, the composition of the Committee is not as strong as expected because its operations have to chiefly rely on the Department of Thai Traditional and Alternative Medicine. So the roles of the DTAM and the Committee cannot be segregated, resulting in the Committee's lack of independence and good governance as it has to rely on DTAM director-general's policy during each time period as well as the capacity of DTAM personnel.

Besides, the Thai Traditional Medical (TTM) Knowledge Fund, according to the Act, has been designed to provide financial support for the protection of TTM wisdom and Thai herbs. So far, the Fund has supported a lot of searches, retrievals and transcriptions or translations of original TTM texts or textbooks; but the work has been moving rather slowly. Concerning the conservation of plant varieties at the sources of origin, indigenous healers and personal wisdom as well as the model for benefit sharing have been developed. In addition, part of the budget has been allocated for the operations of provincial registrars and herbal research. However, there has been no monitoring of most Fund's activities, resulting in their slow progress, little achievements with short-term rather than long-term outputs, inefficient use of resources and unprofessional management.

Thus, it is necessary to resolve the structural and management problems of the Committee and the Fund so that they will be more efficient with good governance. Relevant laws have to be amended, especially in relation to the composition, powers as well as duties of the Fund Committee, and the Fund's operating procedures. The aim is to have a strong mechanism to efficiently support the TTM knowledge protection and promotion efforts.

4) Using strategic plan in moving development efforts

As Thai traditional medicine has many development issues, a strategic plan is required for undertaking development activities, chiefly based on facts and rational logics. However, in the past, development actions were not based on a sufficient analysis of real situations. And at present, there are many weaknesses about TTM facts in terms of statistics and social conditions, and so development planning and directions for problem-solving cannot be seriously undertaken. As a result, each development activity has moved very slowly. Despite having had many strategic plans, many of which were based on just a concept without any facts and could not answer major development questions.

For example, regarding the use of facts for the conservation of plant varieties and the protection of herbs at their places of origin under the 60 Community Forests Project, it is essential to know of the real situations and facts about the communities and the implementation guidelines of the project. The guidelines have to specify, if the community should take part in caring for the forest and legally co-exist with the forest, to what extent and how such a situation can be sustained. In reality, the people living near the edge of the forest do not grow medicinal plants as their main occupation. Thus, how should the project be implemented in line with the people's ways of life and will they live together with herbs and the forest? In their real lives, do they have to do something else? Will they have time to care for the herbs in the forest? These are social facts that need to be considered, not only statistical data.

Therefore, efforts are to be made to develop an information system, based on social facts, which will be used in designing a strategic plan as a tool for moving forwards the TTM development in a concrete manner with better advancement than before.

1.4 Conclusion

The development of Thai traditional medicine comprises three main pillars: (1) knowledge, (2) professional personnel, and (3) service system. For each pillar, there are many challenges that need to be reviewed; and suitable directions and strategies have to be drawn up. It has been found that, overall, the TTM knowledge, personnel and service system are interconnected. It is time for the TTM systems to move forwards to meet the international standards – the standards of knowledge, the professional standards and skills/expertise, and clinical practice guidelines (CPG) with clear patient care procedures and steps.

In the near future, Thai traditional medicine will move to an important turning point, according to the government's policy on and support for herb development, which consists of three major national mechanisms: National Herb Policy Committee, legislation on herbal products, and National Master Plan for Thai Herb Development. Besides, more investment budget is being proposed for research on Thai traditional medicine and herbs.

Meanwhile, importance has to be accorded to the management of the TTM movement efforts in an efficient and concrete manner, and evidently for further advancement. In this connection, the old roles have to be adjusted, with new mechanisms developed, for key agencies such as the Department of Thai Traditional and Alternative Medicine, TTM educational institutions, and the TTM Council, as well as the Committee on TTM Knowledge Protection and Promotion, and the Thai Traditional Medical Knowledge Fund. Moreover, the Strategic Plan is to be used as an important tool for TTM development and it will be a guide for supporting all relevant public and private agencies, including partners, to take part in pushing forwards Thai traditional medicine in the same direction, based on the real situations and changing social context.

Chapter

2

Thai Herb Development for Thai Health Stability and Economic Sustainability

"**Thai herbs**" are an identity that reflects Thailand's culture that has been accumulated since ancient times. The country has the knowledge about herbal use for various purposes, including as ingredients in foods and desserts, medicines for treating ailments, and health-care products by the people in the communities, based on indigenous medicine (IM) principles, and as beauty products, wound-healing remedy or elixir. Such traditional wisdom has been passed on from generation to generation as the Thai people's ways of life, creating a distinctive and interesting cultural identity.

However, a rather few actions have been undertaken regarding Thai herb development, unsystematically and inconstantly, while Thailand's biological resources, in terms of plant and animal varieties, are abundant and among the top rankings in the world. The country has about 11,626 medicinal plant varieties, but only about 1,800 (or 15.5%) have been used for various purposes, which facilitates the accumulation of herb wisdom or knowledge that has been ongoing for a long time.

At present, the trends in herbal needs have risen rapidly in terms of people's consumption for health promotion and health care. The rise has also been noted in herbal processing to create value addition, industrial use involving agricultural processing, Thai traditional drug industry, herb-derived drug production industry, and various herbal product industries (such as herbal extracts, cosmetics, and spa

products). Some herbs are in high demand among consumers and producers, generating huge revenues for the country. Thai herbs and herbal products are goods with the potential and can create economic sustainability as they are parts of the target industries – both as First S-Curve industries and a New Engine of Economic Growth – resulting in a New S-Curve growth with more incomes for the people and the country.

But currently, the operations on Thai herb promotion and development in various aspects are rather few and non-continuous, resulting in little development of herb industry and market. This is evident in the low industrial, market, and export values of Thai herbal products, which are very little compared with those in other countries. Besides, the proportion of production, consumption and export values is small as the herbs are mostly raw materials (spices, plants and fruits), rather than in the forms of extracts or manufactured products with much higher economic values. As for the herbs used in the medical and health-care sector, the amount or value is rather small, compared with that of the overall medical and health system of the country.

In the meantime, when considering the changes in social, cultural, environmental, and economic contexts, as well as the lifestyles of the Thai and global populations, the impacts are the rise in the prevalence of non-communicable diseases (NCDs). The World Health Organization (WHO) has forecast that, in 2050, half of the world population will suffer from at least one NCD. According to Thailand's NCD statistics for 2005–2012, the prevalence of NCDs rose nearly two-fold during the seven-year period (from 1,682,281 cases in 2005 to 3,099,685 cases in 2012). In addition, the Department of Disease Control, Ministry of Public Health (MoPH), estimated in 2015 that Thailand spent as much as 52,150 million baht (1.53 billion U.S. dollars, or USD) on NCD care. Moreover, regarding population structure, as the country has become an ageing society, the national health spending has been rising, and if the response efforts to such situations focused only on modern medical care, the country's health financing stability would be negatively affected.

Thus, promoting the use of Thai herbs for illness healing and health promotion in combination with modern medical treatment will be an important way of improving the people's quality of life, reducing overall health-care spending, and creating the country's economic sustainability.

Realizing the importance of herb development, the government has conducted studies and drawn up the National Master Plan for Thai Herb Development. This chapter presents the results of herb situation analyses and certain aspects of the Master Plan so that they can serve as the directions for all relevant sectors to implement herb development activities, involving both economic and social aspects.

2.1 Situations and trends of global herbs market

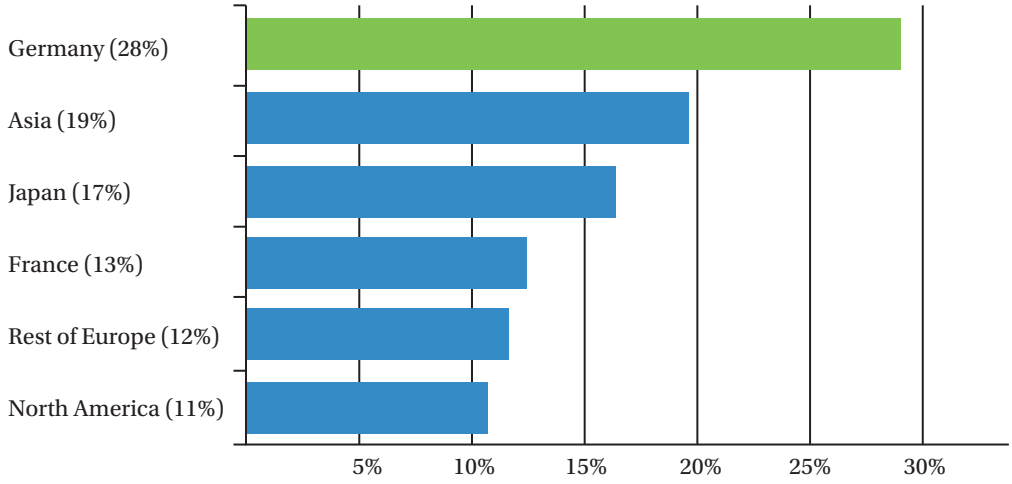
2.1.1 Situations of global market

A survey report by Nutraceutical World during 2007–2008 states that the combined herbal market (excluding soybean, seaweed, and fiber) was about USD 83 billion, and the growth rates for each type of products ranged from 3% to 12%. The proportion of herbal supplements and herbal foods was about 30% of the entire market, while the herbal drug market was about half of the overall market (USD 44 billion), and the rest belonged to beauty herbal products (USD 14 billion). As for the cosmetics market, the share of herbal cosmetics was around 6% of the entire market with an annual growth rate of 8–12%. The regions or countries with a large herbal market were Germany (28%), Asia (19%), Japan (17%), France (13%), the rest of Europe (12%), and North America (11), see Diagram 2.1.

Regarding the herbal market growth in the countries shown in Diagram 2.1 (in 2009–2010), the rates varied from more than 10% to below 0% – low or constant for developed countries, as they had issued rules and regulations related to the consumption of herbs and traditional drugs. Whereas developing countries began to realize the importance of such products, their better packaging efficiency had contributed to significantly higher use or growth rates.

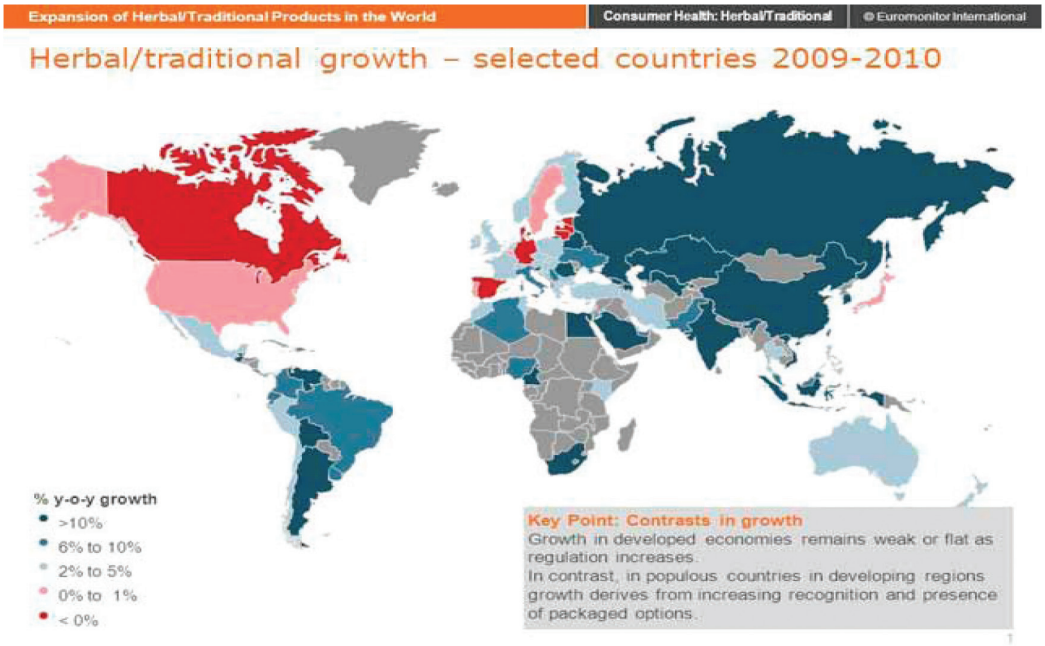
Regarding the types of herbs consumed, at present herbs are the goods with highest potential in the nutraceuticals and cosmeceuticals markets with significant growth rates during the last decade. As for herbal use, the market shares of herbal medicines mostly involve Western herbalism (50.9%), followed by traditional Chinese medicine (34.6%), and the rest are natural therapy (8.2%) and Ayurveda (6.3%), see

Diagram 2.1 Global herbal medicines and supplement markets by region, 2013



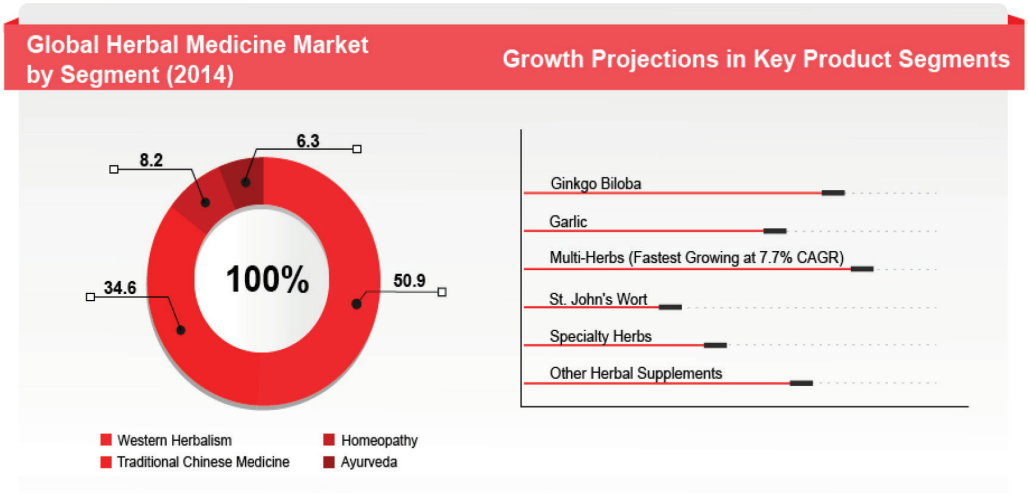
Source: Global Industry Analysts, Inc.

Photo 2.1 Herbal/traditional growth in selected countries, 2009–2010



Source: www.euromonitor.com

Diagram 2.2 Global herbal supplements and remedies market and projection



Source: *http://www.strategyr.com/MarketResearch/Herbal_Supplements_and_Remedies_Market_Trends.asp (February, 2015)*

Diagram 2.2. Concerning the amounts needed by region, the largest was European market, whereas the highest growth in herbal consumption was in the Asia-Pacific region (compound annual growth rate, or CAGR, 9.1%).

2.1.2 Trends in global herbs market

A market survey and projection by Global Industry Analysts, Inc. (2015) shows that the values of the world's herbal supplements and remedies will be USD 115 billion in 2020 due to rapid expansion of the proactive strategy on health promotion and disease prevention to raise the global population's health and well-being status in an efficient manner. The rapid and extensive health awareness of consumers as well as rising trends in health care and beauty, including consumers' self-care, has resulted in a significantly increasing demand for natural and herbal products. Moreover, advances in relevant technological and scientific research and development (R&D) have increased the use of herbs and extracts for the care of neurocognitive condition and hormone functions. In addition, the popularity of organic herbal medicines for medical treatment has also risen rapidly as low-cost and safer alternative care related to hormone replacement and neurological system, compared with mainstream medical treatment.

The reasons behind such trends include the rapidly rising prevalence of cardiovascular disease, diabetes, hypertension, other chronic illnesses, and the high cost of medical treatments based on modern medicine. Besides, ageing society, decreasing household incomes, and non-coverage of health insurance benefits (run by the public and private sectors) have forced the people to manage their health-care spending to the self-controlled level. Moreover, the capacity of the Internet to quickly and extensively reach the target groups in the form of e-Shop online with websites showing video advertisements with product property descriptions, and online social networks is the channel for advertisements, marketing promotion, and distribution of herbal products.

Based on the aforementioned trends, it can be concluded that herbal use is on a rising health-care trend, and part of which that can generate a lot of income and profits is the use of herbs as food supplements, especially those that can boost immunity, enhance organ functions, give energy, and relax or reduce tension. Besides, herb business operators can also use herbs as supplements for women who wish to improve their fertility. Women tends to rapidly change their favourites, lifestyles, and interests, which are diverse, and the operators or producers can respond to such needs and make a lot of money by providing herb-related services in a suitable and timely manner, such as the care for pre- and post-menstrual conditions as well as menstrual symptoms. So it can be said that women are the group of consumers that is important for herb market development.

2.1.3 Potential global market

The aforementioned forecast of herb market trends shows that the Asia-Pacific region will have the most rapid growth rate (CAGR, 9.1%) for the period 2013–2020. That is a result of the region's cultural linkages with herbal use for health care and the confidence in the efficacies and safety of herbs and herbal ingredients of health products. In particular, the countries with a long history of herbal use, such as India and China, have already prepared their environmental conditions thoroughly to facilitate the modern use of herbs within the region. China is one of the suppliers of herbs for use as food supplements to the USA and western Europe.

Besides, regarding herbal use for health care, the Asia-Pacific region has got the largest market, including such use in China and India.

2.2 Herbs market in Thailand

The production of medicinal plants and raw herb material involves the following issues for consideration:

2.2.1 Raw herb material situation:

In Thailand, there are about 800–1,800 herbal species commonly known and used by the communities and about 20,000 species with known scientific names, or 8.1% of all plant species worldwide, of which 1,131 are rare and threatened species. If there are no good systems for the management of raw herb materials and herb growing or propagation, the herbs in nature may be threatened or endangered until extinction. There are three major sources of raw herbs in Thailand as follows:

1) Herbs from herb gardening. According to the Ministry of Agriculture and Cooperatives, currently there are herb gardens with a combined area of 48,727 rai (or 19,491 acres) scattered across the country and a total output of 190,166 tons, for herbs such as, black fingerroot or *kra-chai-dam* (*Kaempferia parviflora* Wall. ex Baker), turmeric or *khaminchan* (*Curcuma longa* L.), Asiatic pennywort or *bua-bok* (*Centella asiatica* (L.) Urb.), *roselle or kra-jiab daeng* (*Hibiscus sabdariffa* L.), phlai (*Zingiber montanum* (J.Koenig) Link ex A.Dietr.), *fa-thalai-jon* (*Andrographis paniculata* (Burm.f.) Nees), aloe or *wahn-hang-jorakhe* (*Aloe vera* (L.) Burm.f.), cardamom or *krawan* (*Amomum testaceum* Ridl.), safflower or *khamfoi* (*Carthamus tinctorius* L.), citronella grass or *ta-krai-hom* (*Cymbopogon nardus* (L.) Rendle), *phlu-khao* (*Houttuynia cordata* Thunb.), edible-stemmed vine or *phetsangkhart* (*Cissus quadrangularis* L.), Indian long pepper or *dee-plee* (*Piper retrofractum* Vahl), wild bitter gourd or *mara-khi-nok* (*Momordica charantia* L.), Javanese turmeric or *wahn-chak-mod-luk* (*Curcuma comosa* Roxb.), eagle wood or *kritsana* (*Aquilaria crassna* Pierre ex Lecomte), nutmeg or *jan-thet* (*Myristica fragrans* Houtt.), peppercorn (*Piper nigrum* L.), garcinia or *som-khaek* (*Garcinia atroviridis* Griff. ex T.Anderson), *ma-khwaen* (*Zanthoxylum rhetsa* DC.), betelvine or *phlu* (*Piper betle* L.), and other herbs. Overall, the total herb growing area is not a lot, compared with that for overall agriculture in the entire country because farmers have many options for growing other plants and are unclear about herbal market.

Moreover, most herbs are integrated as home gardening rather than commercial farming. So there are no reports on this aspect.

Herb growers. There are 12,476 households of herb growers, mostly small scale, and 115 community enterprises that process herbs and produce health products (221 products/services).

2) Herbs from natural sources. Many herbs used as ingredients of Thai traditional drug formulas are collected from natural forests. As there are no systems for land use or herb growing management, propagation, or replacement planting, the quantities of natural herbs have been declining; some are scarce and might become extinct in the future such as smilax or *khao-yen-nuea* (*Smilax corbularia* Kunth), smilax or *khao-yen-tai* (*Smilax glabra* Roxb.), liquorice or *cha-em* (*Glycyrrhiza glabra* L.), chingchee (*Capparis micracantha* DC.), jewel vine or *thaowanpriang* (*Derris scandens* (Roxb.) Benth.), sappanwood or *fahng* (*Caesalpinia sappan* L.), *samunlawaeng* (*Cinnamomum bejolghota* (Buch.-Ham.) Sweet), *sarapatpit* (*Sophora tomentosa* L.), *lampan-hangmoo* (*Enhalus acoroides* (L.f.) Royle), sea acorus or *lampan-daeng* (*Enhalus acoroides* (L.f.) Royle), *hua-roi-roo* (*Hydnophytum formicarum* Jack), and cinnamon or *ob-choei-thai* (*Cinnamomum iners* Reinw. ex Blume). Some of the herbs have to be imported as local herbs are scarce even though the plant varieties might be different from original ones and the drug quality might be affected. Thus, they need to be propagated and taken out of forest for replacement planting and sustainable use of herbs.

3) Herbs imported from overseas. At present, the quantities of herb imports are rather high – mostly raw medicinal herbs, some of which are non-native to Thailand, but can be grown in the country such as herbs in the *koat* or *kod group* and *tian* group. Some are unknown about their planting sources and from where they can be bought, but it is easier to get them imported, which can be handled by a middleman, and the prices are cheaper than buying them in-country. If a good raw material management system is set up, imports can be minimized.

4) Raw herb materials demand and scarcity. At present, more than 300 items of raw herb materials are circulating in the Thai market, especially for preparing formulated drugs, which are getting more important than single-herb drugs. Some herbs are used in small quantities, resulting in farmers' being

uninterested in growing them, but collecting them from natural forests. As there has been no replacement planting, coupled with decreasing forest areas and no studies on production development, many herbs have become scarce. Now six herbs are in high demand in the global market with potential growth in the future; they are: black fingerroot or *kra-chai-dam*, Indian gooseberry or *ma-kham-pom*, turmeric or *khaminchan*, white *kwao khruea*, Asiatic pennywort or *bua-bok*, and *phlai*. As there has been no suitable demand-supply management system, such raw herbs are scarce or some time of poor quality, resulting in a threat to the production industry and exports, which need to be resolved. However, some herbs are scarce due to higher demand for raw materials, higher production rates and rising exports, and there is no suitable production management mechanism, such as for *phlai*, which has only one harvest season a year, and its scarcity is still prevalent.

2.2.2 Qualities and standards of raw herb materials (herbal raw materials)

High-quality and standard raw herb materials are key factors for herbal products to be of good quality and stable properties. Nowadays, most raw herbs used in Thailand are collected from forests, however, some are grown in home gardens with planting promotion, but their quantities do not meet the market demand. Raw material production on a commercial scale for the industrial sector is still little, while the problems of raw material quality still persist, in terms of consistent chemical components and contamination with microbes, arsenic, heavy metals, as well as agricultural pesticides. Most raw herbs and herbal products do not meet the standards because of microbial contamination exceeding the maximum allowable limit, probably in the raw material preparation process (selection, washing, and drying) as well as improper containers and storage. Overall, the production of raw herbs does not satisfy the market demand, in terms of quantities and qualities, resulting in inadequate raw herb supplies for the industrial sector.

However, the trends in producing good quality raw materials have been rising according to trade rules and regulations. Using good raw herb materials will positively affect product development and consumers' confidence. As many as 1,185 herb growers have had their plots certified as using good agricultural practice (GAP), but many more have to improve their growing practices to produce quality raw

herbs with acceptable active ingredients, non-contamination with microbes, fungi and heavy metals, and acceptable levels of other impurities. Organic agriculture has also been promoted for small scale growers to use the integrated farming approach, not using chemicals, and moving towards achieving the organic farming standards.

With the reasons and trends mentioned earlier, relevant agencies need to give importance to quality control at all production stages, from upstream including the processes of planting, harvesting, processing and storing. Some herbs need specific harvesting methods to obtain herbs with specified quality. For example, sacred lotus or *bua-luang*, its pollen is to be harvested from full bloom flowers so as to have a quality herb in accordance with the traditional knowledge. But for commercial purpose, harvesters will collect the pollen from unbloomed flowers, whose qualities are lower. These issues need to be considered when preparing herb planting and harvesting standards to get high-quality raw materials. Moreover, more efforts need to be made to promote organic farming in herb production to minimize contamination due to the growing process, and to get raw herbs according to the raw material standards. Setting herb standards according to the TTM and indigenous medicine principles and the raw material standards in the Thai medicine production, according to the internationally recognized Thai Herbal Pharmacopoeia, is a basic and important action in creating raw material standards in parallel with the other suitable actions. That will help resolve the basic problem related to raw herb quality in the herb production.

2.2.3 Herb industry in Thailand

Herbs have been used in several industries, be they traditional drug production or herbal processing industries, such as producing herb extracts for use as raw materials in producing some modern medicines. Some are used as ingredients of cosmetics and spa products.

1) Numbers of manufacturers/operators

According to data from relevant agencies, currently the numbers of producers of herbal products includes:

1. Herbal (traditional) drug manufacturers: There are totally 877 producers or places, including 296 in Bangkok and 581 in other provinces (source: Food and

Drug Administration, or FDA, September 2016). Of that number, 25 or 2.6% were certified to meet the Good Manufacturing Practice (GMP) requirements; but all have been revoked, according to the FDA notification on GMP certification for traditional drug producers, dated 22 December 2014).

2. Dietary supplement manufacturers: Totally there are 21 places, including 15 factories and 6 non-factories (source: Statistics on food producers/importers by food type, 2012, Food and Drug Administration).

3. Cosmetics manufacturers: There are 200 places (source: Thai Cosmetic Manufacturers Association, statistics as of 22 June 2016).

However, regarding the sizes of manufacturers, according to the database of the Industrial Works Department, Ministry of Industry, at present there are 106 industries or factories related to herbs, registered with the Department. The proportion of such industries is small compared with all industries, see Table 2.1.

Based on the aforementioned features of manufacturers, it is evident that Thai herbal industries are mostly medium- and small-sized (98%). So if there is a need to raise their competitiveness, as a whole, all agencies concerned have to push for changes and adjustments in their efficiencies and productivity, and the use of science, technology and innovation. Moreover, wisdom and creativity have to be deployed in creating additional values and diverse products, as well as responsiveness to contextual changes and demand as appropriate.

Table 2.1 Number of industries related to herbs by type and size

Type of industry	Number of industries by size			
	Small	Medium	Large	Total
1. Herbal drugs	6	23	6	35
2. Herbal drinks and foods	2	21	5	28
3. Herbal dietary supplements	-	5	2	7
4. Herbal cosmetics	-	11	5	16
5. Others	4	16	-	20
Total	**12**	**76**	**18**	**106**

Source: Document for a meeting of the Herb Working Group, under the Subcommittee on Accelerating the Implementation of Policy on Special Economic Zones: Medical Hub Cluster, 18 March 2016.

2.2.4 Certification of manufacturing standards

Most Thai traditional drug manufacturers are small household scale industries with outdated machinery, lacking R&D capacity and investment budget. Thus, to develop the standards of Thai traditional and herbal drug industries, efforts should be made according to their potential, namely:

1) Industries that have been GMP/herb-certified should be supported to develop further to achieve a higher level of GMP until they meet the Good Clinical Practice (GCP) requirements to prove drug safety and efficacy in humans.

2) Industries that have not been GMP/herb-certified, but have high potential to develop further, mostly are old medium- and large-sized, with difficulties to achieve the GMP certification, state agencies concerned have to provide them with more knowledge and advice on how to improve their production process to satisfy the GMP/herb requirements.

3) Industries that have not been GMP/herb-certified and have low potential to develop further are mostly small-sized or family scale with practices passed down for generations; and their drug formulas have been used and proved for a long time. Their efforts seem be difficult to reach the GMP/herb certification as they require a huge investment. If the government enforces the GMP/herb regulations, it would be a destruction of the old drug production system and some drug formulas might be lost. One way to resolve this problem is to hire a GMP/herb-certified factory or a herbal-drug producing hospital to produce such drug formulas through a joint knowledge management mechanism, involving the manufacturing process and raw material management. Meanwhile, a competent organization should be assigned to undertake knowledge management and development activities and assist them to move towards GMP/herb certification.

4) Community-level industries, especially those involved in the One Tambon One Product (OTOP) scheme. Sets of Community Product Standards (CPS) have been established for more than 2,000 products, and 687 products have been CPS-certified for 11,755 producers. So Thailand has been able to raise the qualities or standards of community herbs so that they are reliable for consumers within the country and enhance their competitive potential on a continual basis.

2.2.5 Export and import quantities of herbs in Thailand

The statistics of herb exports and imports in Thailand's international trade system appear in the Customs Department's database with Harmonized System (HS) codes. As for Thai herbs, they are recorded as plant varieties and parts of plants (including seeds and fruits) chiefly used for producing aroma substances in pharmaceutical or pesticide industries (HS 1211) and herbal saps as well as plant extracts such as pectic substances, pectinate/pectate salts, and agar from seaweed, etc. (HS 1302), whose export-import quantities are shown in Tables 2.2–2.5. However, it is noteworthy that the herbal characteristics shown in the database cannot systematically generate a herbal data system for the country to correctly reflect the overall picture of the herb industry.

Table 2.2 Values of Thai herb exports in the form of plant varieties and parts of plants (including seeds and fruits) chiefly used for producing aroma substances in pharmaceutical or pesticide industries (HS 1211), 2013–2015

Export market	Export values, million baht		
	2013	2014	2015
Global	432.2	440.6	431.6
Japan	118.7	118.2	130.2
China	149.2	157.7	114.4
Hong Kong	65.7	72.7	94.0

Source: Thailand Trading Report (http://www2.ops3.moc.go.th), document for a meeting of the Herb Working Group, under the Subcommittee on Accelerating the Implementation of Policy on Special Economic Zones: Medical Hub Cluster, 18 March 2016.

Table 2.3 Values of Thai herb exports in the form of herbal saps as well as plant extracts such as pectic substances, pectinate/pectate salts, and agar from seaweed (HS 1302), 2013–2015

Export market	Export values, million baht		
	2013	2014	2015
Global	211.9	226.5	206.1
Myanmar	82.2	89.8	90.6
U.S.A	28.4	25.5	30.2
Philippines	0.7	1.3	11.7

Source: Thailand Trading Report (http://www2.ops3.moc.go.th), document for a meeting of the Herb Working Group, under the Subcommittee on Accelerating the Implementation of Policy on Special Economic Zones: Medical Hub Cluster, 18 March 2016.

Table 2.4 Values of Thai herb imports in the form of plant varieties and parts of plants (including seeds and fruits) chiefly used for producing aroma substances in pharmaceutical or pesticide industries (HS 1211), 2013–2015

Import source	Import values, million baht		
	2013	2014	2015
Global	535.8	542.2	601.4
China	387.6	396.9	428.4
India	52.0	58.2	55.6
Laos	21.5	21.5	24.4

Source: Thailand Trading Report (http://www2.ops3.moc.go.th), document for a meeting of the Herb Working Group, under the Subcommittee on Accelerating the Implementation of Policy on Special Economic Zones: Medical Hub Cluster, 18 March 2016.

Table 2.5 Values of Thai herb imports in the form of herbal saps as well as plant extracts such as pectic substances, pectinate/pectate salts, and agar from seaweed (HS 1302), 2013–2015

Import source	Import values, million baht		
	2013	2014	2015
Global	2,834.8	2,971.3	3,058.6
China	545.9	825.5	741.3
Brazil	322.0	283.7	400.3
U.S.A.	286.6	248.9	290.1

Source: Thailand Trading Report *(http://www2.ops3.moc.go.th)*, document for a meeting of the Herb Working Group, under the Subcommittee on Accelerating the Implementation of Policy on Special Economic Zones: Medical Hub Cluster, 18 March 2016.

However, according to the above data, it is noteworthy that Thailand's exports have not changed much each year. As for herbs in the HS 1211 group, most of their exports went to China, followed by Japan, while the HS 1302 herbs, exports were mostly directed to Myanmar, followed by the USA. Regarding imports, HS 1211 herbs were mostly imported from China, followed by India, whereas HS 1302 herbs were mainly imported from China, followed by Brazil.

Herbs for exports are chiefly in the forms of dried powder, crude extracts, and herbal products. Their export value was 245.27 million baht for 2014, mostly for peppercorn and turmeric. In the same year, for herbal products, their consumption and export value was more than 80,000 million baht for the group of food supplements, about 10,000 million baht for herbal spa products, and about 10,000 million baht for Thai traditional medicines. Regarding herb imports, the trends have been rising for raw herbs and herbal extracts. In 2014, the import value of raw herb materials was 1,099.61 million baht, mostly including peppercorn, cinnamon, Chinese star anise (*janpaedkleeb, poi-kak*, or *Illicium verum*), herbs in the *koat* and *tian* groups, and others that are essential in the Thai drug industry. Such herbs are mostly imported from China, India, and Indonesia.

Regarding the values of traditional drug production and imports, Table 2.6 shows that the import value was lower than that for production. So Thailand has the potential to produce traditional drugs for domestic use, but the GMP certification for the herbal drug industry is at a low level. If the country wants to export such products, it needs to follow the GMP PIC/S (Pharmaceutical Inspection Co-operation Scheme) requirements, which need a lot of improvements.

Table 2.6 Values of Thai traditional drug production and imports, 2011–2013

Year	Traditional drug production (million baht)			Traditional drug imports (million baht)		
	Human use	Animal use	Total	Human use	Animal use	Total
2011	3,516.90	8.06	3,524.96	474.13	0	474.13
2012	3,703.60	10.321	3,713.92	500.43	0	500.427
2013	4,722.78	8.506	4,731.28	690.49	0	690.49

Source: Food and Drug Administration, 2016.

2.2.6 Thai herb market and herbal use in Thailand

In Thailand, the centre of herb market is in Bangkok, which has about 13–15 large traders in Chakkrawat subdistrict of Samphanthawong district, who are wholesalers, importers and/or producers of traditional drugs. As for raw herb material collectors, they are scattered in major herbal sources such as Songkhla, Ratchaburi, and Nakhon Pathom provinces; and there are herb-grinding factories in Bangkok's peripheral areas. Herb prices are unstable, varying with production quantities and demand. At present, some traders have begun classifying raw herbs and selling them according to herb qualities, but the farmers still have no price bargaining power.

The Thai herb market has faced major challenges after entering the ASEAN Community and bilateral agreements with many countries. Even though Thailand has had advantages regarding experiences in R&D on pharmaceutical industry and marketing, its upstream raw herb production sector needs to accelerate farmers' potential and capacity building, in terms of quality, costs and labour, so that its herbs are competitive with those from other potential countries in the region (Cambodia, Laos, Myanmar, and Vietnam). In the downstream production sector, the competition of herb products will be very fierce with those from Malaysia, Indonesia, the Philippines, China and India, which have invested in the production and trade in member states or bilateral partners.

Concerning the trends in herb market for each consumption objective, according to a survey on drug-use values for 24 herbal drugs in the National List of Essential Medicines (NLEM), the annual value is about 14,000 million baht, which has been rising steadily. Herbal drug production is undertaken in 70 state-run hospitals, of which 45 have been GMP-certified. That reflects the people's increasing awareness of health care with herbal medication in the Thai public health system. Besides, as Thailand has become an ageing society and will be an aged society in the near future, there will be opportunities and challenges in health care in the future, and the Thai traditional and herbal medicine sector has to respond to the needs arising from such contextual changes.

In regard to herbal use for health promotion and as beauty products, at present, as the people are more health-conscious, the statistics from the Thailand Health and

Beauty Confederation show that the market value of dietary supplements for health was approximately 80,000 million baht in 2011, whereas that for herbal-drink products, ready-made herbal drinks and spa products was more than 30,000 million baht, with a growth rate of 30%. A study on the consumption of foreign herbal products in Thai households in 2013, according to the 2014 data from the National Statistical Office, shows that among not-too-high income families (monthly income less than 10,000 baht), some of them (2.5%) tried to use foreign herbal products, and among middle-income families (monthly income 10,001–30,000 baht), 5% bought and used foreign herbal products, and such proportions are rising with higher economic status. The herbs that were consumed the most were ginseng and *lingzhi* or *ling zhi*. Regarding cosmetics, the export value was 140,000 million baht and 90% of the raw herb materials were imported for the manufacturing sector, and the value of herbal extract imports was 20,000 million baht for such purposes. Even though the proportion of herbs used in herbal cosmetic and food-supplement industries is smaller than that in the drug and extract industries, their higher industrial values are important options for promoting herbal industry development.

Besides, an important trend is noted in herbal use for animal production, which has been rising significantly as the producers realize the safety of consumers. That is a major request for animal feed producers to seek and use raw natural products, instead of antibiotics. Research studies have supported the use of herbs in lieu of antibiotics, such as *fa-thalai-jon*, turmeric, galangal *or kha*, and *phlai*, which can prevent and control animal diseases, and reduce the chances of having drug-resistant and certain illnesses in humans as a result of antibiotic growth promoter (APG) use in animal farming.

2.2.7 Research and development (R&D) on Thai herbs

Research on the body of knowledge about Thai herbs mostly focuses on seeking scientific evidence to support the improvement of herb quality, efficacy, and safety, which are important for manufacturing herbal products, including herbal medicines or other health products. During 2000–2004, an analysis of Thai herbal research papers published in technical journals showed that there had been 395 studies conducted by Thai and foreign researchers, of which 223 were published in

international journals and the rest (172 articles) in Thai journals, covering more than 200 herb species. It is evident that Thailand has a number of competent researchers who have conducted internationally accepted research studies.

Furthermore, reports on situations of research on Thai traditional medicine (TTM), indigenous medicine (IM), and alternative medicine (AM) have shown that the proportion of herbal studies was greater than 50% of all studies surveyed. For instance, a review conducted by Thawatchai Thien-ngam and colleagues on 1,476 TTM/IM/AM studies undertaken between 2000 and 2009, showed that 788 studies (53.4%) were on herbs, of which 517 (65.6%) were on identifying knowledge for producing human and animal drugs, cosmetics, food, and other products.

It is noteworthy that many studies focused on creating new knowledge for herbal development and moving towards innovations. However, such a report has shown that very few studies (only 37, or 4.69%) were on herb marketing and use behaviours. Overall, many studies have reflected the people's acceptance of herbal drugs. A report on the assessment of herbal drug use and safety in MoPH hospitals that produced herbal drugs according to the GMP requirements showed that more than 80% of herbal drug users were satisfied with such drugs, and more than 90% wanted to return and use such drugs again. The value of health service consumption related to Thai traditional and alternative medicine in 2013 was about 14,000 million baht, and 58% of Thais knew of herbal drugs, but very few (less than 1%) knew and actually used Thai traditional formulas.

Anyhow, overall research has not clearly targeted any herbs or herbal products, and research directions seem to be scattered, mostly according to researchers' expertise. That reflects the fact that Thailand is facing many aspects of herbal R&D, ranging from the lack of national research directions and having research work that does not respond to the needs of the industrial and production sectors, to redundant research funding and abundant basic research but lacking full-cycle research that leads to product development.

To respond to the country's herb development plan, keeping in mind the human resource and funding constraints to achieving concrete results, the directions and goals of such a plan need to be product-oriented and have tangible goals/ targets. Moreover, resources have to be mobilized from all herb-related public and private agencies as well as educational institutions to collaborate in this effort. The

research concept needs to be drawn up, beginning from selecting herbs with various potentials (commercial, therapeutic or other), and then develop common goals/ targets so that the R&D efforts will result in supply-chain development, covering R&D on raw herb quality development (seed selection, propagation, planting, harvesting, post-harvest storage – to ensure raw material quality), and R&D on industrial production, as well as demand creation. All such operations will result in full-cycle development efforts and it is expected that they will be successful at the national level and accepted internationally.

However, regarding the funding support for herbal R&D, to date it has been found that Thailand's overall research budget is approximately 25,000 million baht, or 0.2% of its gross domestic product (GDP). Such an R&D investment is rather low, compared with that in developed countries. As for herbal research budget, totally it is only 300 million baht, or 1.2% of the total R&D budget of the country despite the fact that herbal R&D is an important factor for the success of Thai herb development. In addition to specifying a clear direction for allocating more budget for full-cycle development and value creation as planned, the budgeting process has to ensure adequate research supplies and equipment. With more research investment, the herbal R&D process will be accelerated to more rapidly achieve the goals.

2.3 Problems of herbs in Thailand

In Thailand, many herbs are scarce and have to be imported. The scarcity is due to the lack of herbal farming support and knowledge about raw herb production for use in the manufacturing of Thai medicines. Moreover, its good management system is not in place to obtain correct herb varieties and knowledge of planting and harvesting; and a good raw material production process has to be deployed to ensure that the materials are not contaminated and adulterated. The quantities produced do not meet the demand due to inadequate support from relevant government agencies in promoting and protecting herb varieties, as well as the lack of standards for examining herb qualities, resulting in poor raw herb qualities and quantities, and ultimately poor quality Thai herbal or health products for exports and fetching revenues into the country. Such herbs

are turmeric, *phlai*, Indian gooseberry or *ma-kham-pom*, blady grass or *ya-kha* roots, smilax or *khao-yen-nuea* and *khao-yen-tai*. So the role of Thai traditional medicine is diminished.

According to the Ministry of Agriculture and Cooperatives, in 2013, the commercial herb growing area was only 42,553 rai (17,021 acres), and it dropped to 34,936 rai (13.974 acres) in 2014, which is very small compared with all the country's agricultural land. In herbal farming, there were only 9,015 households engaged in such activities, mostly small scale and clustered as 315 herb community enterprises. The trends in demand for herbal extracts have been rising, resulting in rising demand for raw herbs. In 2014, raw material and extract imports from China, India, and Indonesia for use in traditional drug industries were worth as much as 1,099.61 million baht.

Due to the lack of herbal R&D support, in terms of directions and systems, the capacity of the Thai drug and herb industry is still low, despite the country's abundance of biodiversity and herbs for therapeutic and health promotion purposes. The reasons are the lack of R&D to create modern technologies for producing new products, the lack of quality control measures and laboratories for raw herbs and herbal products that are internationally acceptable, and legal constraints in using new technologies and know-how for product development, and inadequate research for scientifically describing medicinal properties and treatment efficacies, especially in comparison with the number of herbs that require research support.

The criteria for herbal product registration are inconsistent with the context and directions for using herbal products and Thai traditional medicine. They are also obstacles to creating knowledge and new indications, timely registrations of herbal drugs, timely trade competition, and consumer protection, even for Thai traditional drug formulas.

The problems of Thai traditional drugs and herbal products. Such problems are related to the adulteration of products for sale as they are not legally registered. Oftentimes, some drugs/products are adulterated with unsafe chemicals such as steroids, weight-lowering substances, and vasodilators. Another problem involves false advertisements, over-claims and overpricing, particularly through direct sales, community radio, satellite or cable television, and the Internet.

In addition to wasting their money and time, the consumers might be adversely effected by the dangerous effects of such products and losing the opportunity to receive correct medication by tagging on the global and national trends in the use of Thai herbs and traditional medicine. Regarding the legal measures undertaken by state agencies, most cases were handled very slowly or untimely, and the consumers had become the victims or damaged. This is because most people do not have the correct knowledge of such products and are unaware of the distorted sales promotion tricks, so they cannot undertake self-care and protect themselves from such illegal herbal medicines and products.

When considering the supply chain of herbal development, the problems in each step of the entire chain can be summarized as follows:

Table 2.7 Problems in the value chain

Step in the value chain	Herb situations in Thailand
1. Relevant research and development (R&D)	
1.1 R&D and discovery of herbal drugs and products	- Rather small amount of budget is allocated for R&D in the country (in relation to GDP), less feasible for budget allocation for herbal research. - No clear directions for budget allocation (research topics mostly dependent on researchers' interests).
1.2 Clinical experiments	- Laboratories mostly belong to state agencies and educational institutions; some are substandard and inadequate in numbers.
1.3 Commercial scale development	- Operators of SMEs cannot easily access research results for use in commercial scale. - Operators of SMEs tend to be unable to transform research results into commercial products smoothly and go through the Valley of Death – due to financial and consultative constraints.
2. Procurement of raw material for production	
2.1 Herb growing and relevant operations	- Herb growing does not correspond with the needs for consumption and herbal product manufacturing. - No farming plans for systematically reflecting the manufacturing needs.

Table 2.7 Problems in the value chain (continue)

Step in the value chain	Herb situations in Thailand
2.2 Management of raw materials and storage	- Deforestation to obtain raw materials without replacement planting or reforestation, resulting in herbal non-existence in the forest and probably extinction. - Little understanding about standard raw material management, resulting contamination and poor storage, unable to retain herb qualities within the specified timeframe.
2.3 Imports of raw materials	- Many types of herbs are insufficient, or do not exist in country, or exist in country but are substandard, resulting in reliance on imports of raw materials or extracts in manufacturing industries.
2.4 Exports of raw materials and extracts	- Many types of herbs are needed in foreign markets; in many cases, in-country manufacturing is only for exports.
3. Registration and certification by relevant agencies	- Sluggishness in the registration and certification processes by state agencies, resulting in a bottleneck of further actions.
4. Manufacturing	
4.1 Quality control in manufacturing	- Production qualities are substandard, especially in SMEs.
4.2 Support for commercial manufacturing	- Support and privileges are inadequate to facilitate efficient competition.
5. Marketing and related processes	- Lack of knowledge about Thai herbs.
6. Transport	
6.1 Storage during transport	- Some parts of the transport are of poor quality or substandard, resulting in products' lower quality, lost saleability and competitiveness.
6.2 Transport management	
7. Consumers	- Consumers' lack of correct understanding about herbs, resulting in inappropriate consumption.
8. Mechanisms for monitoring and policy-making in the future	- There are no committee and substantive law on setting directions for herb development.

These situations are to be considered when developing a National Master Plan for Thai Herb Development so that there will be suitable actions to address the situations and problems, leading to sustainable development.

2.4 National directions for Thai herb development

Thai herb development has been accorded importance constantly. During the General Prayut Chan-o-cha government, a directive dated 14 August 2015 was issued, assigning the Ministry of Public Health and other relevant agencies such as the Ministry of Agriculture and Cooperatives and the Ministry of Commerce to further develop Thai herbs so that they can be used efficiently and accepted, and to create additional values of the products derived from Thai herbs.

Besides, the Public Health Reform Committee of the National Reform Council has proposed six issues for the reform of Thai traditional medicine as follows:

Issue 1: Reform of management structure and mechanism for excellence in Thai traditional medicine

Issue 2: Reform of workforce education and development to "Create Thai Unity-Identity"

Issue 3: Reform of research and development of knowledge based on Thai traditional wisdom

Issue 4: Reform of Thai traditional medical services in parallel with modern medicine

Issue 5: Reform of Thai traditional and herbal drug industry towards "National Security and Drug Depot"

Issue 6: Reform of the protection of Thai traditional wisdom – "Thailand's World Heritage"

Moreover, the Minister of Public Health's policy related to Issue 6 specifies that research and development is to be undertaken to promote Thai traditional wisdom and Thai herbs in a full-cycle manner for boosting Thai economy.

2.5 First National Master Plan for Thai Herb Development, 2017–2021

Objectives: In preparing the First National Master Plan for Thai Herb Development, 2017–2021, the framework of the government policy on Thai traditional medicine reform was used in setting the flowing objectives:

1) Develop herbs further for producing therapeutic and other products.
2) Create added economic values of herbs with linkages between herbal industries and other economic sectors.
3) Drive plan activities systematically for Thai herb development with linkages in a full-cycle manner.
4) Facilitate collaboration among relevant public and private sector agencies.

Based on the aforementioned objectives, the Steering Committee and the Committee on Drafting the First National Master Plan for Thai Herb Development, 2017–2021, comprising representatives from various agencies working on Thai herb development, have drawn up the vision, mission, and targets of the plan as follows:

Vision

"Thai herbs for health and sustainable economy"

Mission

1) Develop Thai herbs so that they are accepted and used with full potential and efficiency.
2) Support the production of Thai herbs that meet the standards with good quality and added value for herbal products.
3) Enhance the competitiveness of Thai herbs in domestic and overseas markets.
4) Promote the knowledge and understanding about Thai herbs as well as their correct and appropriate use.

Targets

1) Thailand will be a country that exports high-quality raw herb materials and outstanding herbal products in the ASEAN region by 2021.
2) Values of local raw herb materials and herbal products increase at least twofold by 2021.

Strategies

The Master Plan specifies four strategies to achieve the objectives as follows:

Strategy 1: Promote the productivity of potential Thai herbs to meet local and overseas markets' demands.

Strategy 2: Develop the herb industry and marketing according to international standards.

Strategy 3: Promote the use of herbs for treating illnesses and health promotion.

Strategy 4: Strengthen public sector administration and policy for driving Thai herb development in a sustainable manner.

The details of each strategy as well as its strategic objectives, strategic targets, indicators, measures and programmes and Quick Win (short-term outputs) are as follows:

Strategy 1: Promote the productivity of potential Thai herbs to meet local and overseas markets' demands.

This strategy covers the management of herb farming, raw herb processing, raw herb quality, and raw herb marketing, research and development (R&D) on raw herbs, and protection of herbs and wisdom related to the use of herbs in Thailand, using the following three measures:

1) Management of supply chain
2) Research on, and setting up of, raw herb standards
3) Conservation and use of herbal plants from forests in a sustainable manner

Strategic objectives

1) To promote herb farming and basic processing according to the quality requirements.
2) To increase the quantities of high-quality raw herb materials to nearly meet the demands of herbal industry operators.
3) To conserve Thai herbs for use in a sustainable manner.

Strategic targets

1) A combined land area of 43,000 rai (17,200 acres) grows high-quality herbs according to the herb-growing standards.
2) 50 farmers' groups, cooperatives, and community enterprises promoted to carry out post-harvest processing in the growing areas and produce simple herbal products as well as extracts.
3) Guidelines for good agricultural practices or good agricultural and collection practices (GAP/GACP) or other standards prepared for at least 30 herbs.
4) One land use database established on land areas with herb cultivation.
5) Land suitability maps drawn up for at least 30 herbs.
6) Number of ISO 17025-certified laboratories for herb quality inspection increases by at least 15 (10 in the Ministry of Agriculture and Cooperatives and 5 in universities).
7) Four central market systems and one e-market established.
8) Thai Herbal Pharmacopoeia covering an additional 75 herbal products prepared.
9) One National Database of Thai Medicinal Plants and Traditional Knowledge established.
10) 30 R&D projects conducted each year on herbal varieties and raw material production technology.

Strategic indicators

1) At least 50% of all herb-farming areas grow high-quality herbs.
2) At least 50% of all herb-farmers/processing groups follow the GAP/GACP guidelines.

Quick wins (short-term outputs)

1) At least 5,550 rai (2,220 acres) of herb-growing areas (1,920 acres in herb plots and 300 acres in community forests) follows the GAP/GACP guidelines.
2) One Land Use report (situation and database) prepared on herb farming in Thailand.
3) GAP/GACP standards (on herb growing and harvesting) prepared for at least 2 important herbs.
4) Raw medicinal herb or material standards (materia medica) established according to the TTM principles for 300 items.
5) At least two central herb markets and one e-market established.
6) An additional eight ISO 17025-certified laboratories established for examining the qualities of raw herb materials.
7) Standard substances in place for quality control of at least two raw herb materials.
8) Herb standards established according to Thai Herb Pharmacopoeia for an additional 15 items.

Strategy 2: Develop the herb industry and marketing according to international standards.

This strategy covers the development of factors related to the herb industry, extended R&D on utilizing research results, and the creation of reliability and sales promotion of herbal products, using the following three measures:

1) Development of Thai herb industry
2) Research and development on Thai herbs
3) Development of Thai herb marketing

Strategic objective

1) To produce high-quality herbs with competitive potential in domestic and overseas markets.

Strategic targets

1) Market values of herbs and herbal products in Thai and foreign markets increase by 15% per year.

2) Productivity of herbal extract industries enhanced: sales value increasing by 15%
3) At least 50% of herbal extract industries in each group pass the production upgrading programme.
4) Herbal products with a quality certification logo recognized in the ASEAN region.
5) At least 30% of herbal products certified according to the herbal product quality standards.
6) At least one Thai laboratory certified according to the OECD GLP standards by 2019.
7) A National Institute for Herbal Innovation Development established.

Strategic indicators

1) Herbal product values at home and overseas increase by at least 15% per year.

Quick wins (short-term outputs)

1) A Competency Model exists for five industrial groups: medicines, food supplements, cosmetics/spa products, extracts, and animal-use products.
2) 50 new premium herbal products manufactured.
3) International recognition logos received for Thai herbs.
4) Recognition logos received by three groups of herbal products: food supplements, cosmetics, and spa products.
5) At least 10 new herbal products are in the process of applying for Geographical Indication (GI) registration.
6) Marketing channels for herbal products extended to overseas markets such as health or medical tourism promotion and international trade exhibitions.

Strategy 3: Promote the use of herbs for treating illnesses and health promotion.

This strategy covers the development of TTM service system, research on herbal drug formulas and herbal food, TTM workforce, and access to herbal drug formulas at health-care facilities, and the promotion of indigenous medicine wisdom and proper herbal use, using the following six measures:

1) Development of service structure, and promotion of service delivery and use of herbs at health-care facilities.
2) Research on knowledge creation, standards, quality and risks.
3) Development of technical strengths of Thai traditional medicine.
4) Management and accessibility of herbal drugs in the National List of Essential Medicines.
5) Use of herbs for health promotion and disease prevention in the communities, and roles of indigenous or folk healers.
6) Communications to create correct knowledge, understanding and confidence.

Strategic objectives

1) To increase the use of herbs in the health system for treating illnesses and health promotion.
2) To establish the foundation of TTM and Thai herb development as part of the country's health system in the long run.

Strategic targets

1) Number of herbal drug items in the National List of Essential Medicines increases by at least 10 per year.
2) Systems for drug and herbal drug registration revised to meet market demand in a timely manner.
3) Modern doctors' prescriptions of herbal drugs increase by at least 20% per year.

Strategic indicators

1) Values of herbal drugs used at health-care facilities increase by 10% per year on average.
2) An additional 50 herbal drug items included in the National List of Essential Medicines by 2021.

Quick wins (short-term outputs)

1) Values of herbal drugs used at health-care facilities increase by at least 10%.
2) Full-cycle Thai traditional and alternative medical clinics established in 80% of state health-care facilities (regional, general and community hospitals).
3) Clinical practice guidelines (CPG) using Thai traditional medicine prepared for four illnesses.
4) Research undertaken on Thai traditional formulas to add 10 drug formulas to the National List of Essential Medicines.
5) Thai Preparation Herbal Pharmacopoeia prepared for at least 5 drug items.
6) Communities empowered to run a programme on health promotion with herbs in at least 1,000 subdistricts.

Strategy 4: Strengthen public sector administration and policy for driving Thai herb development in a sustainable manner.

Under the National Master Plan for Thai Herb Development, this strategy covers the development of administrative structure, laws on herbal products, and herb database, the assessment of herb-related competitiveness, the management herb R&D, the designation of herbs with potential for promotion, and the implementation of the Master Plan at the provincial level, using the following six measures:

1) Development of herb administration structure
2) Development of laws for herb promotion and product control
3) Development of herb databases and systems for assessing herbal competitiveness
4) Establishment of management mechanisms for herb research and development
5) Promotion and development of herbal Product Champions
6) Development of Herbal Cities

Strategic objective

1) To set up a mechanism for Thailand to develop herbs with potential to create more economic values for the country.

Strategic targets

1) Thailand has principal laws on herbs and a National Committee on Herb Development.
2) Budget for herb research rises to 5,000 million baht during the 5-year period.
3) The proportion of private sector investment on research rises to 50–70% by 2021.
4) Thailand has at least 10 herbal Product Champions.
5) Thailand has indicators for measuring herbal competitiveness.
6) Thailand has a programme to promote and support herb development for integration into the Thai health and economic systems, on a full-cycle scale, at the provincial level, using the *Pracharat* (civil-state) approach or partnership mechanism.

Strategic indicators

1) A National Herb Policy Committee and related subcommittees can function by 2017.
2) Sales of herbal Product Champions increase by at least 2,000 million baht.

Quick wins (short-term outputs)

1) Establishment of a National Herb Policy Committee.
2) Proposition of draft bill (act) on herbal products B.E. .....
3) Establishment of a database on economic values of herbs in Thailand.
4) A clear Herb Research Plan drawn up with a mechanism for allocating a budget of 5,000 million baht.
5) Herbal Product Champions designated and measures existing for promoting each of the Product Champions.
6) Herbal Cities exist in four provinces.

Investment budget

The First National Master Plan for Thai Herb development, 2017–2021, to be implemented with the four strategies, will lead the country to being a herb leader in the region. The plan aims to further develop Thai herbs, based on the country's accumulated wisdom, diverse natural resources, geographical advantage (being centrally located in the region), and industrial strengths.

Moving towards such a goal, the country needs cooperation from both public and private sectors under the *Pracharat* (civil-state) partnership mechanism with the investment budget of 18,499.95 million baht for the five-year period of the First National Master Plan. This is to ensure plan implementation according to the established directions, seriously and continuously, by the National Herb Policy Committee, as detailed below:

Table 2.8 Budget for the First National Master Plan for Thai Herb development, by strategy, in fiscal years 2017–2021

Strategy	Budget type	Fiscal year and budget (million baht)					
		2017	2018	2019	2020	2021	Total
Strategy 1	Operating	134.02	116.14	97.81	107.98	125.53	**581.48**
	Investment	60.70	61.00	62.50	63.50	65.00	**312.70**
Strategy 2	Operating	87.90	91.20	92.60	98.10	102.50	**472.30**
	Investment	20.00	20.00	20.00	10.00	10.00	**80.00**
Strategy 3	Operating	31.00	31.00	31.00	31.00	31.00	**155.00**
	Investment	1,000.00	1,520.00	1,520.00	1,520.00	1,520.00	**7,080.00**
Strategy 4	Operating	879.82	1,260.28	1,446.86	1,851.49	1,640.02	**7,078.47**
	Investment	640.00	450.00	500.00	550.00	600.00	**2,740.00**
Total	Operating	1,132.74	1,498.62	1,668.27	2,088.57	1,899.05	**8,287.25**
	Investment	1,720.70	2,051.00	2,102.50	2,143.50	2,195.00	**10,212.70**
Grand total		**2,853.44**	**3,549.62**	**3,770.77**	**4,232.07**	**4,094.05**	**18,499.95**

2.6 Conclusion

As a result of the aforementioned factors, namely the population structure changing to become ageing and aged societies, global population's trends in chronic illnesses, people's awareness about health care with natural products, and a 9.1% rise of Thai herbs in the Asia-Pacific market, it is Thailand's opportunity to accelerate Thai herb development. That is to improve the qualities and create added values of Thai herbs, based on the five capitals: natural capital and cultural capital (having jointly generated valuable national wisdom), human capital plus social capital (linking each other in the entire value chain, upstream, midstream and downstream, and creating the forces for knowledge sharing and market linkages at the national, regional and global levels), and physical capital, all with government support regarding infrastructure, legal advice, and facilitation related to herb development. Thus, collaboration is seriously needed from all relevant public, private and civil society agencies/organizations in a continuous manner, with government support through the civil-state partnership approach, to implement the First National Master Plan for Thai Herb development, 2017–2021, at the local and national levels. This is to drive the nation forward from a middle-income country to a high-income one, or Thailand 4.0, in the future according to the government's policy.



Chapter

3

Thai Traditional and Alternative Medical Services Systems

The systems of Thai traditional medicine (TTM) and indigenous medicine (IM) services have been fundamental in the popular or civil sector's health system for a long time with Buddhist temples (or *wat*) being the centres of TTM instruction or teaching/learning as well as treatment of illnesses. The story about TTM was first evidenced in the directory of feudal status, or *sakdina*, enacted by King Trailokanat in 1455 for civil servants in various departments such as Departments of Medical Services (*Krom Phaettaya*), Pharmacy (*Krom Phaettaya Rongphra-osot*), Internal Medicine (*Krom Moh Ya*), Massage Therapy (*Krom Moh Nuad*). Such systems had been continually conserved until the reign of King Chulalongkorn (Rama V) when a medical school was established in 1900; and both TTM and modern medicine disciplines were taught during the first phase of the school's operations. Later on during the reign of King Rama VI, the TTM teaching and learning at the medical school was discontinued in 1915. However, some TTM practitioners assembled and got many TTM associations established for teaching or training in TTM, using an individual teacher-student, or mentor-apprentice, approach and providing TTM services for patients in all regions of the country. Meanwhile, indigenous or folk healers and the general public still use the knowledge of traditional and indigenous medicine as a way of life and self-healthcare.

When the World Health Organization (WHO) declared the "Health for All" policy in 1978 and Thailand also adopted the primary health care (PHC) policy in its national health plans beginning in 1981, the use of herbs or medicinal plants as well as Thai traditional, indigenous and alternative medicine (TTM/IM/AM) has been promoted and widespread across the country. In 2003, the Department of Thai Traditional and Alternative Medicine (DTAM – formerly known as Department for Development of Thai Traditional and Alternative Medicine) was established; and in 2009, the Second National Health Assembly passed Resolution No. 7, "Development of Thai traditional, indigenous and alternative medicine as a core health-care system for the country, in parallel with modern medicine". In 2013, the Thai Traditional Medical Professions Act B.E. 2556 (2013), or 2013 TTM Professions Act, was enacted and, as a result, the Thai Traditional Medical (TTM) Council was set up in the same year.

The draft Constitution of Thailand B.E. 2559 (2016) requires that the development of TTM wisdom or knowledge be supported for the maximum benefits:

"Section 55. The State shall take actions for the people to receive good-quality and thorough public health services, educate the public to have the basic knowledge of health promotion and disease prevention, and support the development of Thai traditional medicine for the maximum benefits.

The public health services prescribed in paragraph one shall cover health promotion, disease control and prevention, medical treatment, and rehabilitation.

The state shall develop public health services to have better quality and standards on a continual basis."

The Ministry of Public Health (MoPH), in 2015, incorporated Thai traditional and integrative medical services into the country's health services system, resulting in a higher level of support in terms of budget, personnel and other relevant resources.

This chapter deals with the development of Thai traditional and integrative medical services system, or Service Plan, including TTM workforce, TTM services, and TTM expenditure.

3.1 Development of Thai traditional and integrative medical services system

In 2015, the Thai traditional and integrative medical services system was incorporated as the 12th system in the national health-care system. Its major aims are (1) to use the TTM services that have been outstanding with technical evidence in treating patients through a comprehensive approach together with modern medicine and the multidisciplinary team; (2) to reduce the gap between TTM/AM practitioners and modern medical doctors; and (3) to take part in the consultation on patient care. The system's measures, guidelines and action plan are as follows:

3.1.1 Four key measures are:

1) Setting up a committee on Thai traditional and integrative medical services system development at all levels.

2) Organizing TTM services at three levels and getting manuals prepared: Level 1, Advanced; Level 2, Intermediate; and Level 3, Basic.

3) Promoting and supporting integrative or comprehensive services provision, using a multidisciplinary team and a patient-centred approach.

4) Developing TTM clinic models for providing Thai traditional and alternative medical services in hospitals (896 A-F3 hospitals).

(1) Establishing a TTM clinic at each of state hospitals' outpatient departments (OPD).

(2) Providing full-cycle Thai traditional and alternative medicine services, including TTM services (Thai medicine, Thai pharmacy, Thai massage and Thai midwifery) and alternative medicine services (traditional Chinese medicine, or TCM, and palliative care).

(3) Setting up specialty clinics for four diseases: migraine, knee osteoarthritis, stroke (paresis/paralysis), and upper respiratory allergies.

3.1.2 Levels of Thai traditional and integrative medical services are:

a. Service Level 1: Advanced

b. Service Level 2: Intermediate

c. Service Level 3: Basic

For each of the service levels, the guidelines for service delivery have been prepared so that the health-care facilities can provide services according to their context; and the guidelines are intended for each service level to have a clear role for Thai traditional and alternative medicine. As a result, health services will be thoroughly distributed to cover all geographical areas in the fields of medical treatment, health promotion, disease prevention and rehabilitation. Ultimately, the people will have access to good quality and safe TTM services, and are encouraged to appropriately take care of the health of themselves and their families. The details of services are as follows:

a. Service Level 1: Advanced

1) Health-care facilities at this level are regional and general hospitals.

2) Service activities at this level include:

2.1) Examination and diagnosis, based on the TTM principles and professional standards.

2.2) Procurement, storage and dispensing of Thai drugs with good quality and standards as well as the monitoring of adverse reactions of Thai drugs.

2.3) Proactive operations of Thai traditional medicine (TTM), or alternative medicine (AM), or indigenous medicine (IM) in the community such as:

(1) Health care for special target groups such as stroke patients, older persons, and pregnant and postnatal or postpartum women.

(2) Promotion and support for self-care of the people and their families.

2.4) Palliative care based on the TTM/AM/IM principles, using such items as Thai drugs, herbal food, and meditation therapy.

2.5) Meditation therapy for patient care.

2.6) Examination and diagnosis with the traditional Chinese medicine (TCM) principles by a licensed TCM practitioner or a licensed medical doctor who has attended the three-month acupuncture training recognized by the MoPH.

2.7) Services at a TTM Clinic (parallel OPD) and a TCM Clinic in the outpatient department of each state hospital.

2.8) Full-cycle services at a TTM/AM Clinic for general and certain illnesses such as migraine, knee osteoarthritis, stroke (paresis/paralysis), and upper respiratory allergies.

2.9) Medical treatment using the TTM and TCM principles for inpatients together with modern medical doctors.

2.10) TTM apprenticeship or professional practical training.

2.11) TTM professional skill enhancement programmes.

2.12) TTM/AM research and development.

b. Service Level 2: Intermediate

1) Health-care facilities at this level are community (district) hospitals.

2) Service activities at this level include the services prescribed for Service Level 3 (Basic), TTM/TCM services at the outpatient department, full-cycle TTM/TCM services for inpatients, and professional practical training (TTM apprenticeship), similar to those designated for Service Level 1, items 2.1 through 2.10.

c. Service Level 3: Basic

1) Health-care facilities at this level are *tambon* (subdistrict) health promoting hospitals (THPHs).

2) Service activities at this level include basic and proactive services in the communities, and palliative care similar to those prescribed for Service Level 1, items 2.1 through 2.5.

3.1.3 Guidelines for full-cycle TTM services. For regional and general hospitals, a manual for service provision has been prepared for four diseases with definitions and descriptions.

Full-cycle Thai traditional and alternative medical (TTM/AM) clinic means a unit that provides medical treatment in a regional or general (A-M1) hospital, using the TTM/AM principles for general illnesses and specific diseases [migraine (*lom pra-krang*), knee osteoarthritis (*lom jab pong khao*), stroke (paresis/paralysis, or cerebrovascular disease), and upper respiratory tract allergies]. The services include:

Table 3.1 Thai traditional and integrative medical service activities at each service level

Item	Service activity	Level 1: Advanced	Level 2: Intermediate	Level 3: Basic
1	Examination and diagnosis, based on the TTM principles and professional standards.	√	√	√
2	Procurement, storage and dispensing of Thai drugs with good quality and standards as well as monitoring of adverse reactions of Thai drugs.	√	√	√
3	Proactive operations on TTM/AM/IM in the community.	√	√	√
4	Palliative care based on the TTM/AM/IM principles, using such items as Thai drugs, herbal food, and meditation therapy.	√	√	√
5	Meditation therapy for patient care.	√	√	√
6	Examination and diagnosis with the TCM principles by a licensed TCM practitioner or a licensed medical doctor who has attended the three-month acupuncture training recognized by the MoPH.	√	√	
7	Services at a TTM Clinic (parallel OPD) and a TCM Clinic in the outpatient department of each state hospital.	√	√	
8	Full-cycle services at a TTM/AM Clinic for general and certain illnesses such as migraine, knee osteoarthritis, stroke (paresis/paralysis), and allergic rhinitis (upper respiratory allergies).	√	√	
9	Medical treatment using the TTM and TCM principles for inpatients together with modern medical doctors.	√	√	
10	TTM apprenticeship or professional practical training.	√	√	
11	TTM professional skill enhancement programmes.	√		
12	TTM research and development.	√		

TTM services – TTM treatment performed by a licensed TTM practitioner or a licensed applied TTM (or ATM) practitioner with any of the following services.

(1) Thai medicine (examination, diagnosis and treatment, using Thai traditional medications or drugs and Thai massage, as well as health-care advice)

(2) Thai pharmacy (drug preparation for individual patients)

(3) Thai midwifery (postpartum care for women such as hot salt pot compression, herbal steam bath, and postpartum massage)

(4) Thai massage for therapeutic and health promotion purposes

Alternative medical services, including:

(1) Traditional Chinese medicine (TCM) – Treatment provided by a modern medical doctor who has completed a MoPH-certified acupuncture training or a licensed TCM practitioner.

(2) Other alternative medical services – Treatment methods that are complementary to modern medical care, provided by a licensed medical doctor or a health-care practitioner who has completed any of the MoPH-certified training programs such as palliative care, praying therapy, meditation therapy, acupressure, and inner balance therapy.

3.1.4 Guidelines for running a TTM clinic (parallel OPD clinic)

at a regional, general or community hospital.

TTM clinic (parallel OPD clinic) at a state hospital means a medical service unit that provides both TTM and modern medical services, having the following components:

(1) Having a licensed TTM or ATM practitioner to perform examinations, diagnoses and treatments with the TTM principles at the outpatient department of the hospital.

(2) The TTM practitioner shall perform examinations, diagnoses and treatments with the TTM principles at the outpatient department of the hospital for at least two days per week.

(3) Having parallel screening services performed by a nurse according to the TTM service guidelines at the outpatient department of the hospital.

(4) Having at least 30 items of Thai traditional drugs (single herbal drugs, formula drugs and drugs prepared for individual patients).

3.1.5 Plan on TTM service provision at regional, general and community hospitals

(1) Drawing up roles/duties and designating responsible persons in implementing the Service Plan for Thai Traditional and Integrative Medicine at the provincial level, under the Thai Traditional and Alternative Medicine Group of the Provincial Public Health Office in each province.

(2) Designating a chief of the Thai Traditional and Alternative Medicine Section at each of regional, general and community hospitals.

(3) Designating advisors (modern medical doctors) of the Thai Traditional and Alternative Medicine Section at each of the service units.

(4) Setting up a Committee on Health Service Development for Thai Traditional and Integrative Medicine, and a Service Plan for Thai Traditional and Alternative Medicine, at the regional and provincial levels [provincial level – the provincial chief medical officer (PCMO) as chairperson and the chief of the Thai Traditional and Alternative Medicine Group as secretary], and the service unit level.

(5) Undertaking technical activities at the provincial and service unit levels [establishing or undertaking technical working groups on the four diseases, technical meetings, clinical practice guidelines (CPG) for the four diseases, case conferences, analyses of reports on adverse drug reactions (ADR), and actual use research (AUR)].

(6) Developing a workforce plan for Thai traditional and alternative medicine.

(7) Preparing a list of herbal drugs that can be used in lieu of modern medicines and urging that at least five of such drugs be submitted by the Provincial Public Health Office to the Pharmaceutical and Therapeutic Committee (PTC) of each hospital for inclusion into the Hospital Formulary as appropriate.

(8) Establishing a full-cycle Thai traditional and alternative medical clinic (for migraine, knee osteoarthritis, stroke, and upper respiratory allergies.

(8.1) At least one service unit in each province has a full-cycle Thai traditional and alternative medical clinic that covers all four diseases.

(8.2) Each of all regional and general hospitals has a full-cycle Thai traditional and alternative medical clinic that can handle at least one disease.

(8.3) Community hospitals that are ready have a full-cycle Thai traditional and alternative medical clinic (note – each Thai traditional medicine hospital has a full-cycle Thai traditional and alternative medical clinic for all four diseases).

(9) The regional and provincial level committees will assess the implementation of the Service Plan for Thai Traditional and Integrative Medicine of each service unit.

(10) The implementation of the Thai traditional and alternative medical services in service units is presented at orientation meetings for new personnel, namely doctors, nurses and multidisciplinary team members.

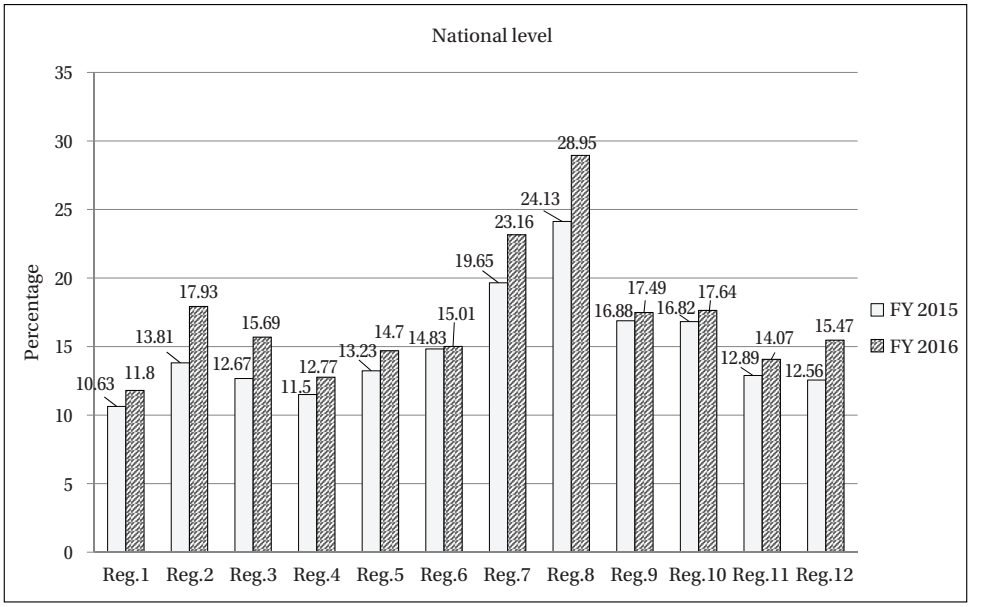
3.1.6 Movement of Thai traditional and integrative medical services

Regarding the movement of Thai traditional and alternative medical services in fiscal years (FYs) 2015 and 2016, according to the TTM Health Script or report and the TTM service accessibility reports of the Health Data Centre (HDC), only two health service regions (Region 7 and Region 8) had a high proportion of outpatients who had received TTM/AM services (18%). During the two fiscal years, every health region had an increase in accessibility to TTM/AM services, see Diagram 3.1.

Many regional, general and community hospitals have set up full-cycle TTM/AM clinics for treating four diseases/conditions [migraine, knee osteoarthritis, stroke (paresis/paralysis), and upper respiratory allergies] for patients under all health insurance schemes. In FY 2016, the most prevalent illness was knee osteoarthritis; its numbers of OPD visits to TTM petitioners and modern medical doctors were 151,577 and 786,392, respectively; and the number of such patients referred to the full-cycle TTM/AM clinics (for full cycle treatment) was as high as 41, 638, see Diagram 3.2.

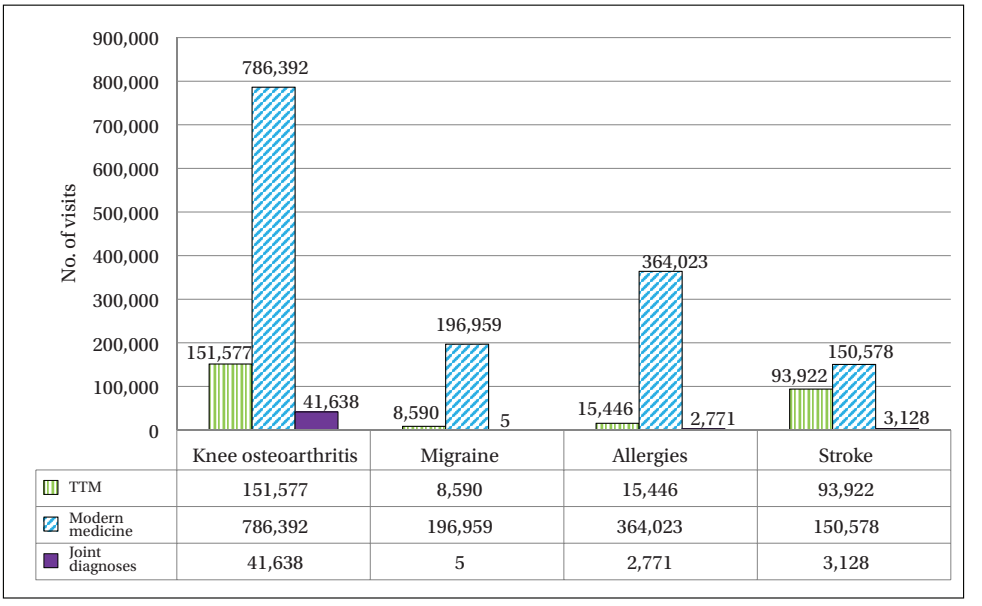
Data on TTM/OPD diagnoses and services at state health-care facilities, under all health insurance schemes, in 12 health regions in FYs 2015 and 2016, showed that the top three groups of illnesses or symptoms were similar, i.e. muscle

Diagram 3.1 Proportion of outpatients who received Thai traditional and alternative medical services under all health insurance schemes by health region in FYs 2015–2016 (Oct 2014–Sept 2016)



Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

Diagram 3.2 Numbers of OPD visits at full-cycle four-disease clinics under all health insurance schemes in FY 2016, 12-month period (Oct 2015–Sept 2016)



	Knee osteoarthritis	Migraine	Allergies	Stroke
TTM	151,577	8,590	15,446	93,922
Modern medicine	786,392	196,959	364,023	150,578
Joint diagnoses	41,638	5	2,771	3,128

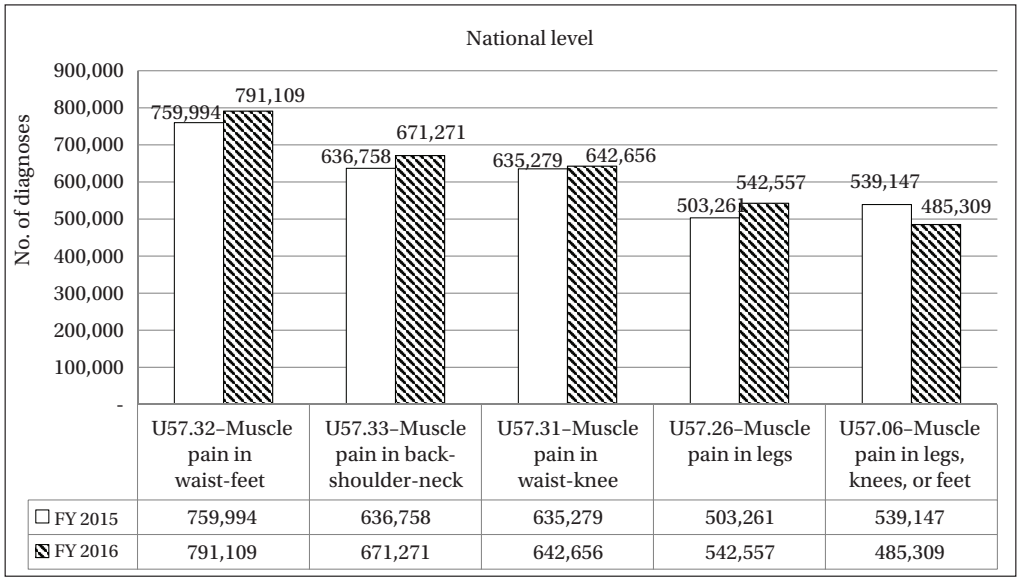
Source: Department of Thai Traditional and Alternative Medicine, TTM Health Script data, 20 September 2016.

pain in the waist through the feet *(lom plai patkard sanyan sam lang*), followed by muscle pain in the back, shoulders, and neck (*lom plai patkard sanyan si lang/ kor*), and muscle pain in the waist through the knees *(lom plai patkard sanyan nueng lang*), see Diagram 3.3.

Data on herbal drug prescriptions at the OPD clinics in state health-care facilities in 12 Health Regions in FY 2015 showed that the drugs that were mostly used were turmeric or *khaminchan*, followed by *ma-waeng* lozenges and *fa-thalai-jon* (*Andrographis paniculata* (Burm.f.) Nees). Whereas in FY 2016, the herbal drugs mostly used were *ma-waeng* lozenges, followed by turmeric, see Diagram 3.4.

By health region and type of herbal drugs, data on herbal drug use at OPD clinics in state health-care facilities for patients under all health insurance schemes showed the numbers of prescriptions of essential drugs (EDs), which are in the National List of Essential Medicines (NLEM), non-essential drugs (non-EDs) and other drugs. In FY 2015, Health Region 9 had the highest number of ED prescriptions, followed by Health Region 8 and Health Region 7, respectively. Whereas in FY 2016, the top ED user was Health Region 8, followed by Health Regions 7 and 9, see Tables 3.5 and 3.6.

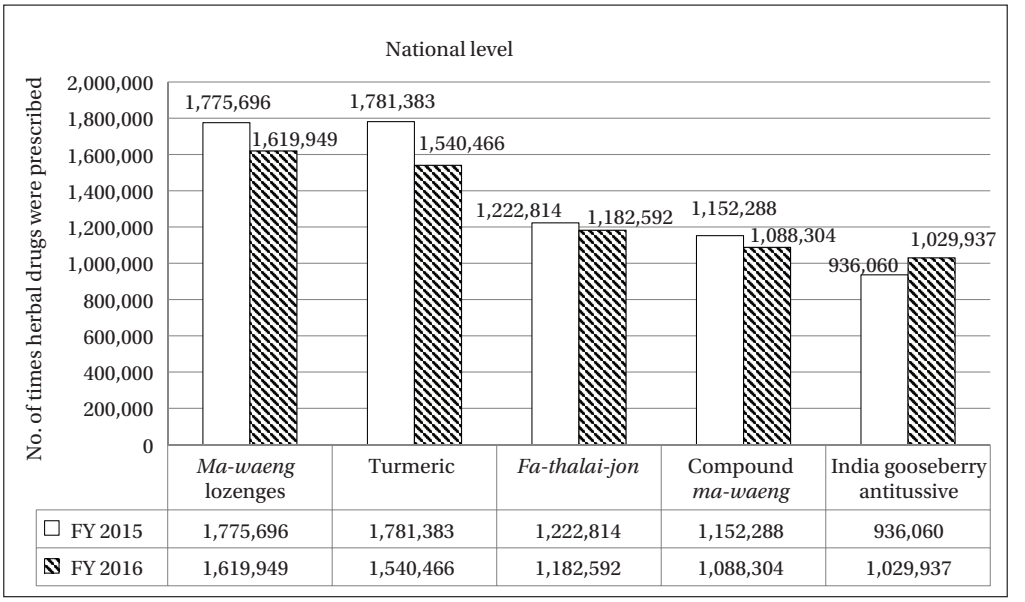
Diagram 3.3 Top five TTM diagnoses of illnesses made at OPD clinics under all health insurance schemes over 12-month periods in FYs 2015 and 2016



	U57.32–Muscle pain in waist-feet	U57.33–Muscle pain in back-shoulder-neck	U57.31–Muscle pain in waist-knee	U57.26–Muscle pain in legs	U57.06–Muscle pain in legs, knees, or feet
FY 2015	759,994	636,758	635,279	503,261	539,147
FY 2016	791,109	671,271	642,656	542,557	485,309

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

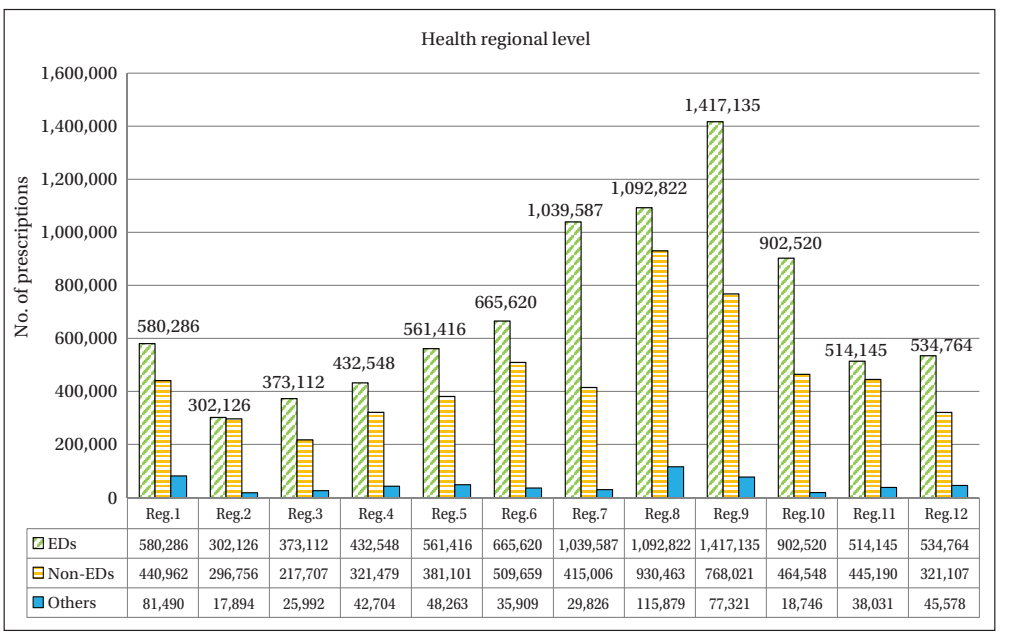
Diagram 3.4 Top five herbal drugs mostly prescribed at OPD clinics under all health insurance schemes over 12-month periods in FYs 2015 and 2016



	Ma-waeng lozenges	Turmeric	*Fa-thalai-jon*	Compound *ma-waeng*	India gooseberry antitussive
FY 2015	1,775,696	1,781,383	1,222,814	1,152,288	936,060
FY 2016	1,619,949	1,540,466	1,182,592	1,088,304	1,029,937

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

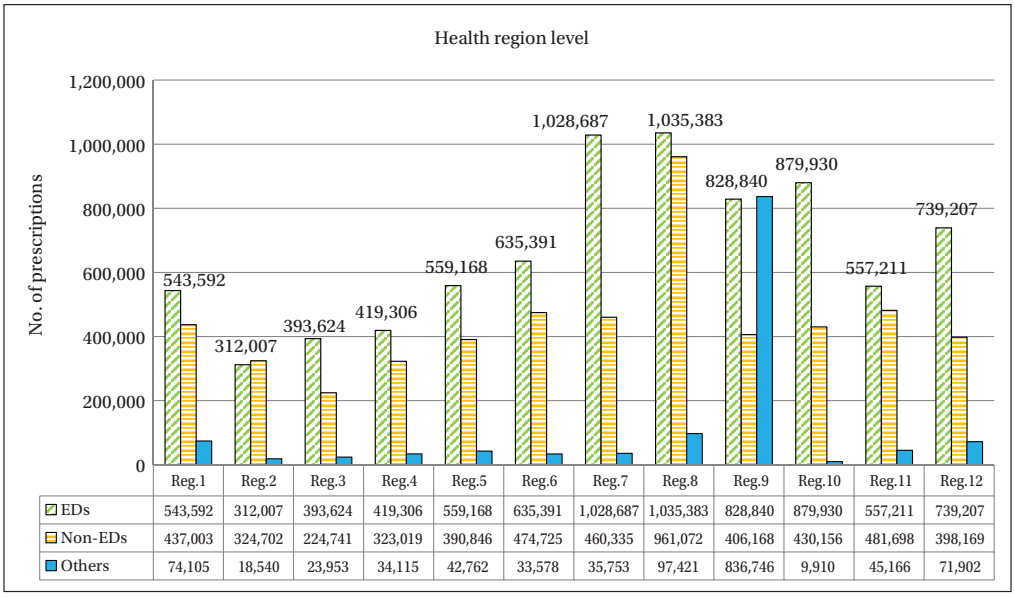
Diagram 3.5 Number of herbal drug prescriptions by type of drugs at OPD clinics under all health insurance schemes in FY 2015, 12-month periods (Oct 2014–Sept 2015)



	Reg.1	Reg.2	Reg.3	Reg.4	Reg.5	Reg.6	Reg.7	Reg.8	Reg.9	Reg.10	Reg.11	Reg.12
EDs	580,286	302,126	373,112	432,548	561,416	665,620	1,039,587	1,092,822	1,417,135	902,520	514,145	534,764
Non-EDs	440,962	296,756	217,707	321,479	381,101	509,659	415,006	930,463	768,021	464,548	445,190	321,107
Others	81,490	17,894	25,992	42,704	48,263	35,909	29,826	115,879	77,321	18,746	38,031	45,578

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

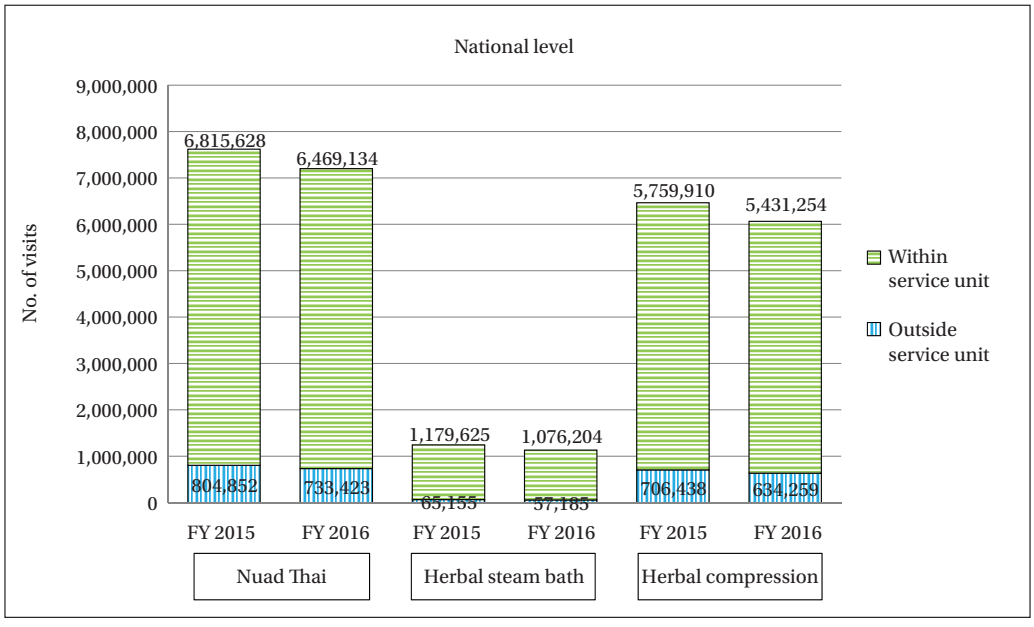
Diagram 3.6 Number of herbal drug prescriptions by type of drugs at OPD clinics under all health insurance schemes in FY 2016, 12-month periods (Oct 2015–Sept 2016)



	Reg.1	Reg.2	Reg.3	Reg.4	Reg.5	Reg.6	Reg.7	Reg.8	Reg.9	Reg.10	Reg.11	Reg.12
EDs	543,592	312,007	393,624	419,306	559,168	635,391	1,028,687	1,035,383	828,840	879,930	557,211	739,207
Non-EDs	437,003	324,702	224,741	323,019	390,846	474,725	460,335	961,072	406,168	430,156	481,698	398,169
Others	74,105	18,540	23,953	34,115	42,762	33,578	35,753	97,421	836,746	9,910	45,166	71,902

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

Diagram 3.7 Numbers of visits for massage, steam bath, and compression performed at OPD clinics in 12-month periods of FYs 2015 and 2016 (in and outside service units)

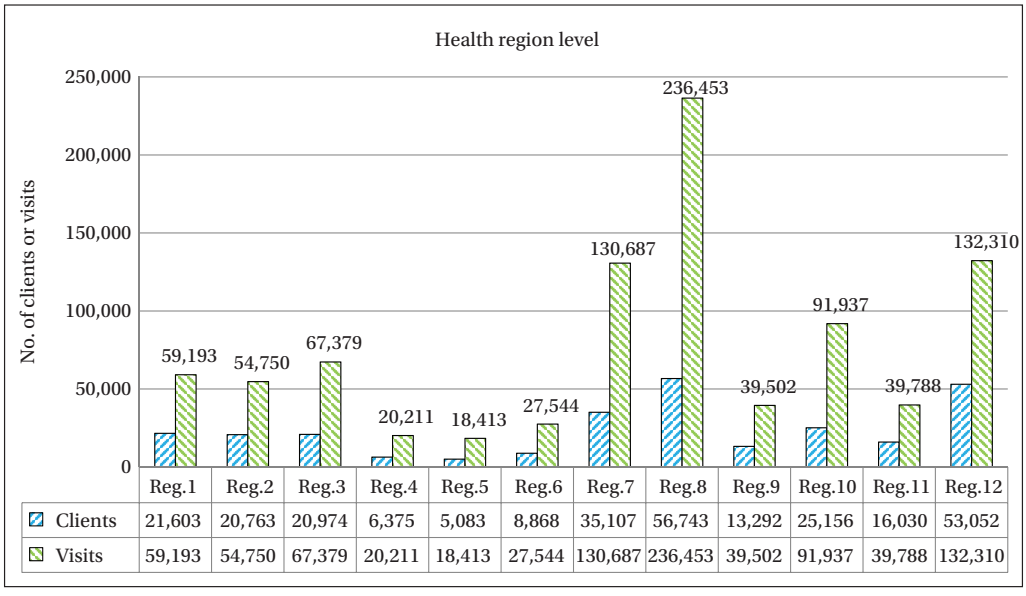


Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

Concerning the visits for massage services including Nuad Thai, herbal steam bath and herbal compression at OPD clinics in state health-care facilities under all health insurance schemes, within and outside the service units, the HDC Service data showed that, for both FYs 2015 and 2016, over 6.8 and 6.9 million Nuad Thai sessions were performed, followed by 5.7 and 5.4 million herbal compressions, respectively, see Diagram 3.7.

Concerning the visits for TTM services of postnatal mothers at all state health-care facilities in all 12 health regions in FYs 2015 and 2016, the highest numbers were noted for Region 8 at 236,453 visits (56,743 persons) in FY 2015 and 194,821 visits (48,781 persons) in FY 2016 as detailed in Diagrams 3.8 and 3.9.

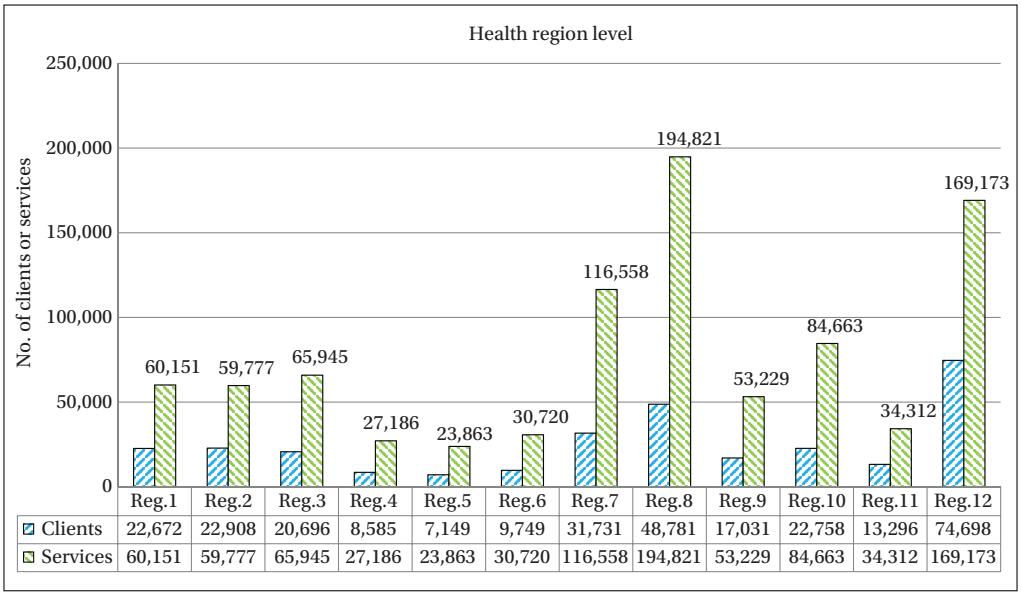
Diagram 3.8 Numbers of TTM clients and visits for postnatal mothers at OPD clinics under all health insurance schemes in 12-month periods (Oct 2014–Sept 2015) of FY 2015



	Reg.1	Reg.2	Reg.3	Reg.4	Reg.5	Reg.6	Reg.7	Reg.8	Reg.9	Reg.10	Reg.11	Reg.12
Clients	21,603	20,763	20,974	6,375	5,083	8,868	35,107	56,743	13,292	25,156	16,030	53,052
Visits	59,193	54,750	67,379	20,211	18,413	27,544	130,687	236,453	39,502	91,937	39,788	132,310

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

Diagram 3.9 Numbers of TTM clients and services for postnatal mothers at OPD clinics under all health insurance schemes in 12-month periods (Oct 2015–Sept 2016) of FY 2016



	Reg.1	Reg.2	Reg.3	Reg.4	Reg.5	Reg.6	Reg.7	Reg.8	Reg.9	Reg.10	Reg.11	Reg.12
Clients	22,672	22,908	20,696	8,585	7,149	9,749	31,731	48,781	17,031	22,758	13,296	74,698
Services	60,151	59,777	65,945	27,186	23,863	30,720	116,558	194,821	53,229	84,663	34,312	169,173

Source: Department of Thai Traditional and Alternative Medicine, HDC Service Data, 20 September 2016.

3.2 Development of traditional Chinese medical (TCM) service system

3.2.1 Development of TCM knowledge and standards

Over the last decade, DTAM's Institute of Thai-Chinese Medicine has promoted and developed TCM knowledge and standards to improve its quality in the public sector's health system. That is in line with the core mission of the MoPH which will lead to people's better health, physically and mentally, using the self-reliance strategy.

DTAM's Institute of Thai-Chinese Medicine has performed its duties in improving or enhancing TCM professional standards, service standards, health-care facilities, personnel capacity and information. The Institute's numerous achievements relating to TCM and health consumer protection over the past decade are the following:

1) Curriculum standards. The Institute served as the lead agency and supported the preparation and adoption of several TCM courses such as the three-month course on acupuncture for modern medical doctors, the Bachelor of Traditional Chinese Medicine (BCM or B.CM.) programme, the TCM assistant training programme, the specialized therapeutic acupuncture course, and others.

2) Clinical practice guidelines. The Institute and the network of acupuncturists have prepared the guidelines for acupuncture therapies for 96 diseases commonly found in Thailand.

3) TCM medicinal and herb standards. As a member of the International Organization for Standardization / Technical Committee 249 (ISO/TC 249) on traditional Chinese medicine, the Institute served as the lead agency and collaborated with other partners within and outside the MoPH in reviewing the standards for herbs and herbal products, and made recommendations to the ISO/TC. Besides, it has collaborated with local and international partners in preparing the standards of Chinese herbs commonly used in Thailand, and conducted research studies on the production and processing of Chinese herbs with economic potential for import reduction, and on *lingzhi* mushroom as well as spores in Thailand.

4) Medical material and device standards. The Institute served as the lead agency and collaborated with other partners within and outside the MoPH in reviewing the standards for TCM materials and devices and made recommendations to the ISO/TC. Besides, it has prepared the specifications of filiform needles and distributed them to several target groups within the country for comments, which will be used for standard development in the future. And a draft standard of herb boiling pot has also been prepared.

5) Textbook standards. The Institute has strengthened TCM knowledge management activities for the benefit of Thai society, and produced 18 textbooks on this matter. All of them have been endorsed by the TCM Professional Committee for use as TCM references of the country.

6) TCM information system. The Institute has set up TCM databases on knowledge, workforce, health-care facilities and educational institutions. Regularly

updated, the information from the databases has been provided to the general public and other interested persons.

3.2.2 Development of standards for TCM service information system

At present, TCM services have been widely used by the people as an alternative medical option for treating illnesses. More than 200 health-care facilities under the MoPH have been providing acupuncture services, but their service information or data have not been collected in a systematic manner to facilitate the retrieval of such data for the development of curative care, personnel capacity and research, as well as for health insurance eligibility verification and medical spending disbursement in the national public health system in a truly efficient manner.

In order that TCM service data recording is undertaken systematically with the same standard, DTAM's Institute of Thai-Chinese Medicine has launched the TCM Service Information System Development Project, aimed at collecting TCM service data at all state health-care facilities, getting them forwarded to the MoPH's 43-folder system, and making data retrieval more efficient for research ad service improvement purposes.

DTAM's Institute of Thai-Chinese Medicine and the Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH, have prepared standard codes of TCM-related disease groups, symptoms, and procedures, using ICD-10-TM clinic digital codes U78–U79. The standardized coding of diseases under the TCM service system in Thailand consists of: (1) Diseases in Chinese medicine; (2) Pattern in identification, or syndrome identification in Chinese medicine; and (3) Procedures in Chinese medicine. The diseases, symptoms and procedures in Chinese medicine commonly found in Thailand were chosen, classified and then assigned ICD codes, based on the information standard preparation assignment of the government of the People's Republic of China, the WHO International Standard Terminologies on Traditional Medicine in the Western Pacific Region, and other references.

In 2015, the Institute of Thai-Chinese Medicine organized a pilot-scale training course on TCM data collection for state health-care facilities that provide TCM services. In the beginning, data on acupuncture services were collected as there were many hospitals that provided such services; and the training on data collection as well as disease and procedure coding was underway for medical record officers of the hospitals so that they could perform such functions correctly. The list of ICD-10-TM codes for TCM diseases, symptoms and procedures, and the manual for medical recording and coding of TCM diagnoses and procedures were also published for distribution as shown in Photos 3.1 and 3.2.

Photo 3.1 List of ICD-10-TM codes for diseases, symptoms and procedures in traditional Chinese medicine

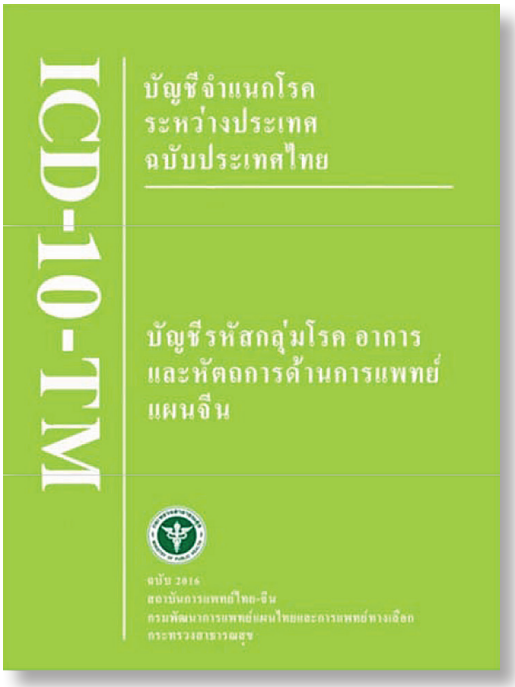


Photo 3.2 Manual for medical recording and coding of TCM diagnoses and procedures in traditional Chinese medicine



3.2.3 Preparation of standard textbooks

During 2013–2015, DTAM's Institute of Thai-Chinese Medicine strengthened TCM knowledge management activities for the benefit of Thai society by producing additional TCM textbooks that have been endorsed by the TCM Professional Committee for use as references as per its announcement dated 15 March 2011. And again on 14 August 2011, another 16 textbooks were endorsed, totalling 18 in number, for use in TCM studies, especially for those who want to apply for a TCM practice licence. The two additional textbooks are: (1) Textbook for acupuncture and moxibustion, volume 5, and (2) Standard of Chinese *Materia Medica* in Thailand, volume 1, as shown in Photo 3.3. As for those that were published in 2016 and awaiting the TCM Professional Committee endorsement are: (1) Traditional Chinese Medicine Dictionary (Chinese-Thai-English), Volume 2; (2) Standard of Chinese *Materia Medica* in Thailand, volume 2; (3) Acupuncture: An Integrative Therapy, Volume 1; (4) Acupuncture and Moxibustion, Volume 1; and (5) Thai-Chinese Herbs with Economic Potential – see Photo 3.4.

3.2.4 Workforce in traditional Chinese medicine

As demand for TCM services is on the rise, so is that for TCM workforce. Many public and private educational institutions have opened courses at the bachelor's degree level (Bachelor of Traditional Chinese Medicine, or BCM, or B.CM., programme) as well as short courses such as a three-month programme on acupuncture for modern medical doctors and specialized acupuncture therapy.

Between 2004 and 2015, seven educational institutions began offering a BCM degree or equivalent, namely (1) Huachiew Chalermprakiet University, (2) Chandrakasem Rajabhat University, (3) Nakhonratchasima College, (4) Chiangrai College, (5) Mae Fah Luang University, (6) University of Phayao, and (7) Rangsit University. They all have produced a total of 596 graduates, of whom 461 (77.35%) have passed the licensing examination and become licensed TCM practitioners; and 1,439 students are still studying as detailed in Table 3.2.

Photo 3.3 Reference textbooks on traditional Chinese medicine that have been endorsed by the TCM Professional Committee



Acupuncture and Moxibustion, Volume 5



Standards of Chinese *Materia Medica* in Thailand, Volume 1

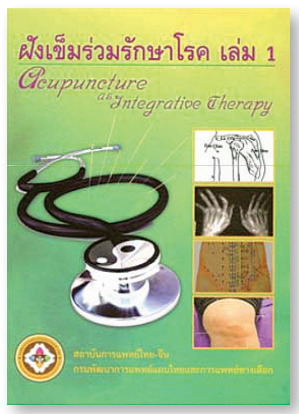
Photo 3.4 Reference textbooks on traditional Chinese medicine that are awaiting the endorsement of the TCM Professional Committee



Traditional Chinese Medicine Dictionary, Volume 2 Chinese-Thai-English



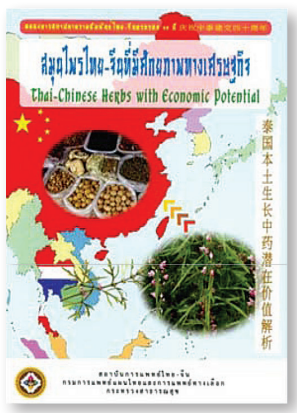
Standard of Chinese *Materia Medica* in Thailand, volume 2



Acupuncture: An Integrative Therapy, Volume 1



Acupuncture and Moxibustion, Volume 1



Thai-Chinese Herbs with Economic Potential

Table 3.2 Data on educational institutions producing TCM graduates, as of academic year 2015

Institution	Graduates, cumulative	Graduates having received a TCM licence	Students studying
1. Huachiew Chalermprakiet University	334	303	697
2. Chandrakasem Rajabhat University	233	151	252
3. Nakhonratchasima College	29	7	116
4. Chiangrai College	-	-	32
5. Mae Fah Luang University	-	-	115
6. University of Phayao	-	-	143
7. Rangsit University	-	-	84
Total	**596**	**461**	**1,439**

Source: Data from educational institutions survey, as of academic year 2015.

According to statistics from the Bureau of Sanatorium and Healing Arts, Department of Health Service Support, from 2009 through 2016, the number of TCM practitioners has been rising steadily to 871, whereas in 2009 there were only 312 TCM practitioners who had received the knowledge from their ancestors, no additional healers in this category. Since 2009, the cumulative number of TCM graduates from within the country and abroad has risen to 559 (August 2016).

In addition to producing TCM personnel, several institutions also offer a three-month acupuncture training course for modern physicians; they are MoPH's Institute of Thai-Chinese Medicine and the Royal Thai Army Medical Department, Ministry of Defence. Both of them use the standard acupuncture curriculum prepared by the MoPH, with assistance from Shanghai University of Traditional Chinese Medicine of China, in terms of resource persons under the memorandum of understanding on cooperation with China's TCM universities. Under the agreement, experts from Shanghai University of Traditional Chinese Medicine offer the training at the Institute of Thai-Chinese Medicine, while those from Chengdu University of Traditional Chinese Medicine

Table 3.3 Number of modern medical doctors who have completed three-month acupuncture training course, 1998–2016

Year	Batch no.	No. of doctors trained in acupuncture			
		Inst. Thai-Chinese Medicine	Praborom-rajchanok Institute	Army Med. Dpt. (AMD)	Total
1998–2012	1–27 & AMD 1–7	466	570	338	1,374
2556	28	-	43	-	104
	AMD 8	-	-	61	
2557	29	41	-	-	101
	AMD 9	-	-	60	
2558	30	38	-	-	38
2559	31	32	-	-	32
Grand total		**577**	**613**	**459**	**1,647**

Source: Institute of Thai-Chinese Medicine, Department of Thai Traditional and Alternative Medicine, data as of August 2016.

conduct the course at the Praboromrajchanok Institute, and those from Tianjin University of Traditional Chinese Medicine conduct the course at the Army Medical Department. To date, 1,649 modern medical doctors have completed the three-month acupuncture course as shown in Table 3.3.

3.3 Workforce for Thai traditional medicine (TTM) and indigenous medicine (IM)

At present the situations or problems of TTM workforce are related to its quality, standard and adequacy for providing Thai traditional and alternative medical services for the people concerning curative care and health promotion. The TTM/IM workforce includes the groups of indigenous healers, ATM professionals and TTM professionals, covering five branches, namely: (1) Thai medicine, (2) Thai pharmacy, (3) Thai massage, (4) Thai midwifery and (5) Thai indigenous medicine.

In this study, the review of each group involves (1) Workforce situation, (2) Workforce production, (3) Workforce distribution, and (4) Workforce loss.

A. Indigenous healers

1) Workforce situation

An indigenous or folk healer means "a person who is knowledgeable and capable of promoting and caring for local residents' health using Thai traditional or indigenous medical wisdom, and in very village he or she is recognized by the community as an indigenous healer."

Indigenous healers are divided into three groups:

(1) Indigenous healers who have had their knowledge certified by a state agency and have passed an evaluation or test specified in the regulations of the Thai Traditional Medical (TTM) Council, from 2005 to 2013, numbering 165 being regarded as licensed TTM practitioners (indigenous medicine branch); and as of May 2016, no more practitioners in that branch have been certified.

(2) Indigenous healers who have been certified according to DTAM's regulation on issuance of certification for indigenous healers (No. 2) B.E. 2555 (2012), numbering 2,427 (August 2016).

(3) Indigenous healers whose names are in the database of the Central Registrar of MoPH/DTAM's Division for TTM and IM Knowledge Protection, numbering 57,665 (May 2016).

2) Workforce production

Currently there is no regulation of the TTM Council related to the assessment of indigenous healers so that they can become licensed TTM practitioners (indigenous medicine branch). So their number has not risen since 2013.

As for the other two groups of indigenous healers, whether their numbers will rise or drop depends on the surveys and database updates of local indigenous healers to be carried out by all 76 provincial registrars.

3) Workforce distribution

3.1) Of all indigenous healers who have been certified by a state agency and passed the TTM knowledge evaluation from 2005 to 2013, 165 of them have been recognized as licensed TTM-indigenous practitioners; some of them have expertise in several healing aspects, but some have only one field of expertise. Of

Table 3.4 Number, distribution and expertise of licensed TTM-indigenous healers*

Number/ distribution		Type of expertise					
Region	**No.**	**Herbal therapy**	**Bone therapy**	**Massage – *japsen, yamkhang, toksen, chedhaek***	**Snakebite remedy**	**Ceremonies or *moh tham***	**Medicinal therapy**
Northern	37	21	10	10	1	1	1
Southern	47	26	18	1	2	-	-
North-eastern	47	35	9	2	2	2	-
Central	34	27	2	2	2	-	-
Total	**165**	**109**	**39**	**15**	**7**	**3**	**1**

** One TTM-indigenous healer may have more than one field of expertise.*

Source: Division of Thai Indigenous Medicine, DTAM, 16 May 2016.

this number, 109 are herbal therapy experts and 39 have expertise in bone fracture treatment. Regarding their distribution, as shown in Table 3.4, most of them are found in the South and the Northeast – 47 healers each.

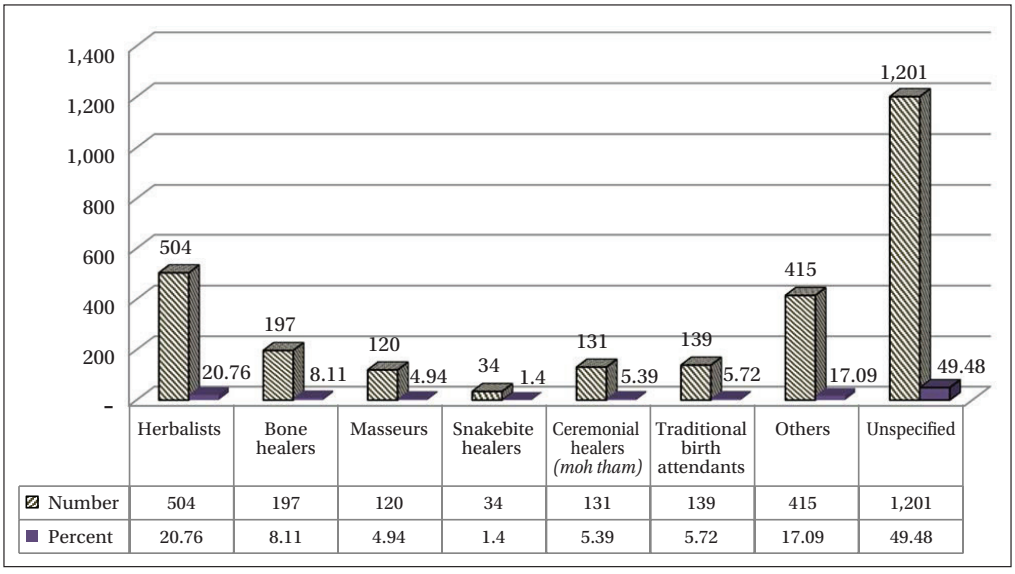
Ages of indigenous healers: For all 165 licensed TTM-indigenous, their ages range from 41 to 95 years; of all 165 healers, 106 (64.24%) are 61–80 years old.

3.2) The number of indigenous healers, who have been certified according to DTAM's regulation on issuance of certification for indigenous healers (No. 2) of 2012, is 2,427. As of August 2016, 2,140 live and work in the Northeast, 136 in the South, 141 in the Central region, and 10 in the North.

Of all 2,417 certified indigenous healers, only 1,226 can be classified according to their expertise, but the rest (1,201) have no sufficient details for expertise classification. However, most of them have several treatment capabilities, or more than one area of expertise.

Anyhow, based on their outstanding capacities, 504 are herbalists or herbal medication experts, and 415 are experts in other fields, i.e. blowing healers (*moh pao*), magic healers (*moh sai-ya-saht*), acupuncturists, fortune-tellers, and shamans (*moh yao*).

Diagram 3.10 Number and percentage of indigenous healers by expertise as certified according to DTAM's regulation, 2016



	Herbalists	Bone healers	Masseurs	Snakebite healers	Ceremonial healers *(moh tham)*	Traditional birth attendants	Others	Unspecified
Number	504	197	120	34	131	139	415	1,201
Percent	20.76	8.11	4.94	1.4	5.39	5.72	17.09	49.48

Note: One indigenous healer may have more than one field of expertise.
Source: Division of Thai Indigenous Medicine, DTAM, 16 May 2016.

4) Workforce loss

As most of the certified indigenous healers or licensed TTM-indigenous medical practitioners are elderly persons without any followers or anyone who will learn or take on such practices from them, their loss is chiefly due to old age, most importantly resulting in the loss of empirical knowledge. Thus, it is urgently necessary to synthesize the lessons learned and record or document the knowledge of indigenous healing. And there should be a mechanism for passing on the knowledge and practices to younger generations. In this connection, during 2014–2015 DTAM's Division of Thai Indigenous Medicine, in collaboration with TTM universities, could synthesize the lessons learned from over 1,550 indigenous healers, at least 26 of whom have died.

B. TTM and ATM professional practitioners

1) Workforce situation

(1) A licensed TTM practitioner under section 12(2)(a) means a person who has completed TTM training from an institution and health-care

facility recognized by the TTM Council with a licensed TTM practitioner who has been certified to pass on the knowledge, and has passed the licensing examination stipulated in the TTM Council's regulation.

This group of TTM practitioners play a very important role as the foundation of TTM services in the popular sector as the traditional teaching/learning system has been practised since ancient times by TTM associations, foundations and clubs under the supervision of TTM practitioners who have already learned from former TTM masters and textbooks.

(2) A licensed TTM practitioner under section 12(2)(b) means a person who has completed a Bachelor of Thai Traditional Medicine (BTM or B.TM.), or Bachelor of Applied Thai Traditional Medicine (BATM or B.ATM.) programme, or equivalent, from an educational institution recognized by the TTM Council, and has passed a licensing examination stipulated in the TTM Council's regulation.

According to statistics from the Bureau of Sanatorium and Healing Arts, from 1929 through 2012, the cumulative number of licensed TTM practitioners was 30,371 as of February 2013 – using individual counting without any death checking system.

The statistics on TTM practitioners in all five branches, including ATM practitioners from the TTM Council, are shown in Table 3.5.

Table 3.5 Numbers of TTM licences, TTM practitioners and ATM practitioners*

Year	No. of TTM licences and ATM practitioners				
	Thai medicine (licences)	**Thai pharmacy (licences)**	**Thai midwifery (licences)**	**Thai massage (licences)**	**ATM practitioners**
Cumulative through 2012	19,676	26,874	7,755	2,730	1,645
2013	334	762	880	419	345
2014					338
2015	660	525	351	710	240
Total	**20,670**	**28,161**	**8,986**	**3,859**	**2,568**

** One TTM practitioner has more than one licence.*

Source: TTM Council, July 2016.

According to the above table, between 2013 and 2015, the number of TTM licences-practitioners rose by 4,641, including 1,281 for Thai pharmacy, 1,231 for Thai midwifery, 1,129 fro Thai massage, 994 for Thai medicine, and 923 for ATM.

As for individual practitioners, the exact number cannot be specified as one individual TTM practitioner can take licensing examinations in all four branches. And some of those who used to study at a recognized TTM institution (Category B) and was accepted to as a learner under the teacher-apprentice approach could take a licensing examination in Category A while studying at the institution. So it is difficult to handle this issue in the TTM professional databases; however, the TTM Council is working on it.

*** In the future, if the TTM Council can issue a TTM membership certificate for each of its members, the number of TTM practitioners can be determined as one member can have only one membership number.*

The TTM membership certificate or TTM membership ID card can be used when applying for registration and practice licensing, and verifying the TTM practitioner's identity.

As for TTM/massage practitioners who are visually impaired, as of September 2016, the TTM Council shows that 34 out of 80 visually impaired applicants could pass the examination and became licensed TTM-massage practitioners under section 12(2)(a) during 2010–2012. No licensing examinations were held for 2013; but for 2014 and 2015, another 10 and 36 visually impaired persons could pass the examination and became licensed TTM-massage practitioners, respectively.

2) Workforce production

2.1 Institutions or health-care facilities permitted to offer TTM training courses

At present, the production of TTM practitioners under Section 12(2)(a) (of the 2013 TTM Professions Act) has to be undertaken by an institution or health-care facility recognized by the TTM Council as per the TTM Council's regulation on criteria, methods and conditions for certification and operations of institutions or health-care facilities to train TTM professionals, B.E. 2557 (2014); and a trained practitioner has to pass the licensing examination specified in the TTM Council's regulation.

The TTM Council's regulation on criteria, methods and conditions for TTM licensing examination of a person trained from any institution or health-care facility certified by the TTM Council is detailed below:

Clause 1. The person must have completed a training/education programme from an institution or health-care facility certified by the TTM Council, under the supervision of a licensed TTM practitioner who has been certified as a TTM trainer or teacher (for the person who has been accepted as a student/learner, under the teacher-apprentice approach, a letter of apprentice acceptance can be used when applying for licensing examination).

*** If the person has completed each branch of TTM training programmes, the training institution or health-care facility will issue a certificate for each person and send the names of graduates to the TTM Council as evidence for taking a licensing examination under section 12(2)(a).*

Clause 2. The person must have completed a period of training specified below:

(1) Thai medicine – completion of a TTM/Thai medicine training period of at least three years.

(2) Thai pharmacy – completion of a TTM/Thai pharmacy training period of at least two years.

(3) Thai midwifery – completion of a TTM/Thai midwifery training period of at least one year.

(4) Thai massage – completion of a TTM/Thai massage training period of at least two years.

In producing TTM workforce in the four branches, the groups and list of 140 institutions or healthy-care facilities that have been recognized to conduct TTM professional training by the TTM Council are shown below and detailed in Table 3.6.

Group of institutions or healthy-care facilities	Number
Private healthy-care facilities	39
Provincial public health offices	32
Associations, professional organizations, schools	27
State health-care facilities	17
Educational institutions	12
Networks/organizations for the blind and children with disabilities	7
Ministry of Social Development and Human Security	3
Regional training centres for primary health care development	2
Department of Thai Traditional and Alternative Medicine	1

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
Associations									
1	Thai Traditional Medicine Association	Chumphon				√	2009	√	2008
2	Thai Massage Professional Association	Nonthaburi				√	2009	√	2008
3	Thai Traditional Medicine Association, Phetchaburi – Prachuap Khiri Khan	Phetchaburi	√	√	√	√	2011		
Professional organizations									
1	Thai Traditional Medicine and Health Promotion Centre (Wat Mai Ban Don)	Nakhon Ratchasima						√	2009
2	Thai Traditional Health Promotion Centre, Hua Sai Hospital	Nakhon Si Thammarat						√	2009
3	Centre for Studies and Promotion of Health and Thai Traditional Medicine	Lop Buri						√	2009
4	Thai-style Health Promotion Centre	Songkhla						√	2007

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
Schools									
1	Thai Massage School	Bangkok				√	2012	√	2007
	Chetawan Traditional Massage School	Bangkok				√	2009		
2	Pisit Thai Medicine (Vejakamthai) School	Bangkok				√	2009	√	2008
3	Wat Phra Chetuphon (Wat Pho) Thai Traditional Medical and Massage School	Bangkok	√	√		√	2015	√	2007
4	Doi Namsap Thai Massage and Herbal Compress School	Bangkok				√	2011		
5	School of Professional Career Extension & Thai Cultural Spa	Khon Kaen				√	2012	√	2012
6	Chiang Rai Prachanukroh School	Chiang Rai				√	2012		
7	Chanthanee Thai Traditional Medicine School	Chiang Rai	√	√	√	√	2015/ 2009	√	2009
8	Jongrak Thai Massage School	Chiang Mai				√	2012		
9	Pattana Panya Thai School	Chiang Mai	√	√	√	√	2015		
10	Thai Massage School Shivagakomarpaj	Chiang Mai				√	2009	√	2008
11	Lanna Thai Massage School	Chiang Mai				√	2010	√	2009-10
12	Maha Boon Thai Massage School	Nakhon Ratchasima	√	√	√	√	2015		
13	Pataravej Siam School	Nonthaburi	√	√	√	√	2015		
14	Phenkhae Thai Traditional Medical School	Pathum Thani				√	2009	√	2008
15	Phuket Thai Massage School	Phuket				√	2015/ 2009	√	2009

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
16	Thai Vejasart School (of Traditional Medicine)	Songkhla	√	√	√	√	2015		
17	Thai-Style Health Promotion School	Songkhla	√	√	√	√	2015		
18	Bunrueang Massage & Spa Occupation School	Surat Thani						√	2009
19	Udon-Thani Thai Traditional Massage & Health Promotion School	Udon Thani	√	√	√	√	2015		
20	Thai Wisdom Promotion School	Udon Thani	√	√	√	√	2015/ 2009	√	2009
Educational institutions									
1	Sirindhorn College of Public Health	Khon Kaen						√	2009
2	Thai Traditional Medicine Study and Development Centre, Khon Kaen University	Khon Kaen	√	√	√	√	2015/ 2012		2012
3	Sirindhorn College of Public Health	Chon Buri						√	2008
4	Faculty of Medicine, Chiang Mai University	Chiang Mai						√	2009
5	Tak Community College	Tak	√	√	√	√	2015		
6	Establishment of Mahidol University Nakhon Sawan Campus Project	Nakhon Sawan						√	2011
7	Kanchanaphisek Medical and Health Technology College	Nonthaburi						√	2010
8	Thai Traditional Medicine College, Rajamangala University of Technology Thanyaburi	Pathum Thani						√	2009
9	Faculty of Medicine, University of Phayao	Phayao						√	2012

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
10	Sirindhorn College of Public Health	Phitsanulok	√	√	√	√	2015	√	2010
11	Thai Traditional Medicine Learning and Development Centre, Faculty of Humanities and Social Sciences, Rajabhaj Maha Sarakham University	Maha Sarakham	√	√		√	2015		
12	Centre for Study and Development of Thai Traditional and Alternative Medicine	Songkhla	√	√	√	√	2015		
Networks/organizations for the blind and children with disabilities									
1	Thailand Caulfield Foundation for the Blind	Bangkok				√	2011	√	2011
2	Foundation for Children with Disabilities	Bangkok				√	2011		
3	Foundation for Employment Promotion of the Blind	Bangkok				√	2012		2012
4	Centre for Vocational Learning and Demonstration for the Blind Thonburi, Thailand Association for the Blind	Bangkok				√	2011	√	2011
5	Association for Promotion of Thai Massage for the Blind	Bangkok				√	2011	√	2011
6	Sam Phran Vocational Training Centre for Blind Women, Foundation for the Blind in Thailand	Nakhon Pathom				√	2011	√	2011
7	Rehabilitation Centre for the Blind, Foundation for the Blind in Thailand	Nonthaburi				√	2011	√	2011
Private health-care facilities									
1	Netdao Thai Traditional Medical Clinic	Bangkok	√	√	√	√	2015		

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
2	Phasi Charoen Thai Traditional Medical Clinic	Bangkok				√	2009	√	2008
3	Thai Traditional Medical Clinic, Ayurvedic Association of Thailand	Bangkok	√	√	√	√	2015		
4	Tao Poon Thai Traditional Medical Clinic	Bangkok				√	2008	√	2008
5	Thaipun Thai Traditional Medical Clinic	Bangkok				√	2011		
6	Ban Manirin Thai Traditional Medical Clinic	Bangkok	√	√	√	√	2015		
7	Ban Suan Orchard Clinic	Bangkok				√	2009	√	2008
8	Vejchasak Thai Traditional Medical Clinic & Training Centre	Bangkok						/ √	2009
9	Pha Wang Chan Thai Traditional Medical Clinic	Kanchanaburi	√	√			2015		
10	Sananvej Thai Traditional Medical Clinic	Khon Kaen				√	2012	√	2012
11	Kiattiwat Thai Traditional Medical Clinic	Chanthaburi	√	√		√	2015		
12	Walailuck Thai Traditional Medical Clinic	Chiang Mai		√		√	2015		
13	Thapthim Thai Traditional Medical Clinic	Nakhon Nayok	√	√	√	√	2015		
14	Pathom Chedi Thai Traditional Medical Clinic	Nakhon Pathom	√	√	√	√	2015		
15	Siripat Thai Traditional Medical Clinic	Nakhon Pathom	√	√	√	√	2015		
16	Rak Sukkhaphap Thai Traditional Medical Clinic	Nakhon Si Thammarat	√	√	√	√	2015		
17	Ruam Phaet Thai Traditional Medical Clinic	Nakhon Si Thammarat	√	√	√	√	2015		
18	Moh Ladda Thai Traditional Medical Clinic	Nakhon Sawan				√	2012	√	2009

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
19	Thai Osot Thai Traditional Medical Clinic (Pattana TTM Foundation)	Nonthaburi	√	√	√	√	2010/ 2015	√	2009/ 2010
20	Moh Napa Thai Traditional Medical Clinic	Nonthaburi	√	√	√	√	2015/ 2009	√	2011
21	Wat Salakon Health Centre	Nonthaburi						√	2012
22	Thai Traditional Medical Clinic	Rayong				√	2008		2009
23	Doctor Boon Thai Traditional Medical Clinic	Rayong				√	2011		2011
24	Phop Arokaya Thai Traditional Medical Clinic	Ratchaburi	√	√	√	√	2015		
25	Lop Buri Thai Traditional Medical Clinic	Lop Buri						√	2010
26	Prasat Thai Traditional Medical Clinic	Lop Buri				√	2009	√	2008
27	Pipattanaporn Thai Traditional Medical Clinic	Lop Buri	√	√	√	√	2015		
28	Amornrat Thai Traditional Medical Clinic	Lop Buri				√	2012	√	2012
29	Boonyong Thai Traditional Medical Clinic	Lampang		√			2015		
30	Muang Singkhra Thai Traditional Medical Clinic	Songkhla	√	√	√	√	2015		
31	Sombun Vejrattakan Thai Traditional Medical Clinic	Songkhla	√	√	√	√	2015		
32	Kanit Thai Traditional Medical Clinic	Songkhla						√	2007
33	Vejchakam Thai Traditional Medical Clinic	Songkhla						√	2007
34	Thai Traditional Medical Clinic	Samut Sakhon				√	2012	√	2011
35	Duangchan Thai Traditional Medical Clinic	Surat Thani	√	√	√	√	2015		

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
36	O-Phasi Thai Traditional Medical Clinic	Surin						√	2009
37	Moh Ong-art Thai Traditional Medical Clinic	Uttaradit	√	√	√	√	2015		
38	Saengdao Applied Thai Traditional Medical Clinic	Ubon Ratchathani						√	2012
39	Sudarat Thai Traditional Medical Clinic	Ubon Ratchathani	√	√		√	2015/ 2011	√	2012
State hospitals									
1	Prapokklao Hospital	Chanthaburi						√	2011
2	Phanat Nikhom Hospital	Chon Buri						√	2009
3	Thai Traditional Health Promotion Centre, Phanat Nikhom Hospital	Chon Buri				√	2011	√	2011
4	Chaiyaphum Hospital	Chaiyaphum						√	2011
5	Huai Yot Hospital	Trang						√	2009
6	Hua Sai Hospital	Nakhon Si Thammarat				√	2011	√	2011
7	Chao Phraya Abhaibhubejhr Hospital	Prachin Buri				√	2007	√	2007
8	Ban Lat Hospital	Phetchaburi						√	2009
9	Damnoen Saduak Hospital	Ratchaburi						√	2009
10	Photharam Hospital	Ratchaburi						√	2009
11	Ratchaburi Hospital	Ratchaburi						√	2009
12	Singhanakhon Hospital	Songkhla						√	2007
13	Somdet Phra Phutthaloetla Hospital	Samut Songkhram						√	2009
14	Sao Hai Chaloemprakiat Hospital	Saraburi						√	2012
15	Kanchanadit Hospital	Surat Thani						√	2009
16	Surat Thani Hospital	Surat Thani						√	2010

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
17	Phana Hospital	Amnat Charoen						√	2012
Provincial Public Health Offices (PPHOs)									
1	PPHO, Ang Thong	Ang Thong						√	2008
2	PPHO, Chachoengsao	Chachoengsao						√	2009
3	PPHO, Nakhon Nayok	Nakhon Nayok						√	2009
4	PPHO, Prachuap Khiri Khan	Prachuap Khiri Khan						√	2009
5	PPHO, Phayao	Phayao						√	2009
6	PPHO, Phetchaburi	Phetchaburi						√	2009
7	PPHO, Mukdahan	Mukdahan						√	2009
8	PPHO, Yala	Yala						√	2009
9	PPHO, Lop Buri	Lop Buri						√	2009/ 2010
10	PPHO, Lampang	Lampang						√	2009
11	PPHO, Loei	Loei						√	2009
12	PPHO, Si Sa Ket	Si Sa Ket						√	2009
13	PPHO, Sa Kaeo	Sa Kaeo						√	2009
14	PPHO, Amnat Charoen	Amnat Charoen						√	2009
15	PPHO, Udon Thani	Udon Thani						√	2009
16	PPHO, Sakon Nakhon	Sakon Nakhon						√	2010
17	PPHO, Chai Nat	Chai Nat						√	2011
18	PPHO, Chumphon	Chumphon						√	2011
19	PPHO, Chiang Mai	Chiang Mai						√	2011
20	PPHO, Nakhon Pathom	Nakhon Pathom						√	2011
21	PPHO, Nakhon Ratchasima	Nakhon Ratchasima						√	2011

Table 3.6 List of institutions or health-care facilities certified by the TTM Council to pass on TTM knowledge or train TTM workforce (continue)

No.	Institution or health-care facility	Province	Curriculum and year certified						
			Thai medicine	Thai pharmacy	Thai midwifery	Thai massage	Year	TTM assistant	Year
22	PPHO, Phra Nakhon Si Ayutthaya	Phra Nakhon Si Ayutthaya						√	2011
23	PPHO, Phatthalung	Phatthalung						√	2011
24	PPHO, Maha Sarakham	Maha Sarakham						√	2011
25	PPHO, Suphan Buri	Suphan Buri						√	2011
26	PPHO, Surat Thani	Surat Thani						√	2011
27	PPHO, Uttaradit	Uttaradit						√	2011
28	PPHO, Ubon Ratchathani	Ubon Ratchathani						√	2011
29	PPHO, Phrae	Phrae						√	2012
30	PPHO, Sing Buri	Sing Buri						√	2012
31	PPHO, Nong Bua Lam Phu	Nong Bua Lam Phu						√	2012
32	PPHO, Kanchanaburi	Kanchanaburi						√	2012
Regional Training Centre for Primary Health Care Development									
1	Northern Regional Office for Primary Health Care	Nakhon Sawan						√	2007
2	Southern Regional Training Centre for Primary Health Care Development	Nakhon Si Thammarat				√	2009	√	2008
Ministry of Social Development and Human Security									
1	Skill Development Centre, Kanchanaburi	Kanchanaburi						√	2010
2	Skill Development Centre, Nakhon Nayok	Nakhon Nayok						√	2011
3	Her Majesty the Queen's 72nd Birthday Anniversary Commemoration Centre	Lamphun						√	2010
Department of Thai Traditional and Alternative Medicine									
1	Institute of Thai Traditional Medicine	Nonthaburi				√	2009	√	2007

Source: TTM Medical Council, May 2016.

A licensed TTM practitioner under Section 12(2)(b) (of the 2013 TTM Professions Act) means a person who has completed a Bachelor of Thai Traditional Medicine (BTM) or Bachelor of Applied Thai Traditional Medicine (BATM) programme, or equivalent, from an educational institution certified by the TTM Council, and has passed a licensing examination stipulated in the TTM Council's regulation.

In producing TTM professional workforce, Section 12(2)(b) prescribes that a licensed practitioner must have received a BTM or BATM degree, or equivalent, from an educational institution certified by the TTM Council, and has passed a licensing examination stipulated in the TTM Council's regulation.

As per the TTM Council's regulation on criteria, methods and conditions for licensing examination of a person who has obtained a BTM degree or equivalent from an educational institution certified by the TTM Council (No. 2) of 2015.

 # According to the provisional clauses of the TTM Council's regulation on criteria, methods and conditions for certifying an educational institution offering a BTM/BATM or equivalent programme B.E. 2557 (2014) (published in the Government Gazette, dated 29 December 2014), the institution must submit a request for the extension of certification at least 90 days before the certification's expiry date, which is around the end of September 2019.

2.2 Institutions offering a BTM/BATM programme or equivalent

(1) TTM educational institutions certified by the TTM Council; 18 of such institutions are shown in Table 3.7.

Table 3.7 TTM educational institutions certified by the TTM Council

Number	Certified institution	Degree	Year curriculum certified/ additional	Date most recently certified	Certification end date
1	School of Traditional and Alternative Medicine, Chiangrai Rajabhat University	Bachelor's	2007/29 Feb 2010	29 Dec 2014*	29 Dec 2019
2	College of Oriental Medicine, Rangsit University	Bachelor's	2007/14 Jul 2010		
3	Faculty of Traditional Thai Medicine, Prince of Songkla University	Bachelor's	2007/19 Feb 2010		
4	Faculty of Natural Resources, Rajamangala University of Technology Isan Sakonnakhon Campus	Bachelor's	9 Oct 2009		
5	College of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University	Bachelor's	9 Oct 2009		
6	Faculty of Science and Technology, Bansomdej Chaopraya Rajabhat University	Bachelor's	28 Mar 2011		
7	Faculty of Science and Technology, Surin Rajabhat University	Bachelor's	7 Nov 2011		
8	Institute of Health Science, Ramkhamhaeng University	Bachelor's	7 Nov 2011		
9	Faculty of Science, Technology and Agriculture, Yala Rajabhat University, and Sirindhorn College of Public Health Yala	Bachelor's	19 Sep 2011		
10	College of Muay Thai Study and Thai Traditional Medicine, Muban Chombueng Rajabhat University	Bachelor's	23 Apr 2012		

Table 3.7 TTM educational institutions certified by the TTM Council (continue)

Number	Certified institution	Degree	Year curriculum certified/ additional	Date most recently certified	Certification end date
11	Faculty of Science and Technology, Phetchaburi Rajabhat University	Bachelor's	15 May 2012		
12	Sirindhorn College of Public Health Chonburi and Burapha University	Bachelor's	25 Oct 2012		
13	Sirindhorn College of Public Health Phitsanulok in affiliation with Rajamangala University of Technology Isan Sakonnakhon Campus	Bachelor's	14 June 2012	29 Dec 2014#	29 Dec 2019
14	Kanchanaphisek College of Medical and Health Technology, Nonthaburi, in affiliation with Rajamangala University of Technology Isan Sakonnakhon Campus	Bachelor's	14 June 2012		
15	Faculty of Health and Sports Science, Thaksin University, Phattalung Campus	Bachelor's	29 Aug 2012		
16	Faculty of Science and Technology, Rajamangala University of Technology Srivijaya	Bachelor's	7 Jan 2014		
17	School of Health Science, Sukhothai Thammathirat Open University	Bachelor's	16 Feb 2014		
18	Faculty of Public Health and Environment, Pathumthani University	Bachelor's	13 Feb 2015	13 Feb 2015	12 Feb 2020

Source: TTM Council, May 2016.

Regarding the workforce production at 18 TTM educational institutions certified by the TTM Council, according to DTAM's survey of February 2016, out of 6,571 students cumulatively admitted, 3,149 are still studying and 3,422 have graduated. However, there have been no follow-up data on the graduates' workplaces and their passing of licensing examination, see Table 3.8.

Table 3.8 Numbers of students admitted to TTM institutions and graduates, cumulative 2016

Number	Educational institution	No. of students admitted	No. of graduates
1	Faculty of Health and Sports Science (beginning 2013), Thaksin University	135	-
2	Sirindhorn College of Public Health Chonburi, affiliated with Burapha University	-	-
3	Faculty of Public Health and Environment, Pathumthani University	83	-
4	College of Oriental Medicine, Rangsit University	1,180	840
5	Institute of Health Science, Ramkhamhaeng University	655	373
6	Faculty of Traditional Thai Medicine, Prince of Songkla University	861	427
7	School of Health Science, Sukhothai Thammathirat Open University	470	389
8	Faculty of Science and Technology, Rajamangala University of Technology Srivijaya	129	31
9	Faculty of Natural Resources, Rajamangala University of Technology Isan Sakonnakhon Campus	524	294
10	Kanchanaphisek College of Medical and Health Technology, Nonthaburi, in affiliation with Rajamangala University of Technology Isan Sakonnakhon Campus	120	-
11	Sirindhorn College of Public Health Phitsanulok, affiliated with Rajamangala University of Technology Isan Sakonnakhon Campus	120	-
12	School of Traditional and Alternative Medicine, Chiangrai Rajabhat University	1,134	834

Table 3.8 Numbers of students admitted to TTM institutions and graduates, cumulative 2016 (continue)

Number	Educational institution	No. of students admitted	No. of graduates
13	Faculty of Science and Technology, Bansomdej Chaopraya Rajabhat University	132	33
14	Faculty of Public Health and Environment, Pathumthani University	-	-
15	Faculty of Science, Technology and Agriculture, Yala Rajabhat University	350	143
16	Faculty of Science and Technology, Surin Rajabhat University	164	44
17	College of Muay Thai Study and Thai Traditional Medicine, Muban Chombueng Rajabhat University	141	65
18	College of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University	537	243
Total		**6,571**	**3,422**

Source: Office of Information and Knowledge Bank, DTAM, February 2016.

(2) Applied TTM (ATM) educational institutions certified by the TTM Council

Table 3.9 Applied TTM educational institutions certified by the TTM Council

Number	Certified ATM institutions	Ed. level	Year curriculum certified/ additional	Date most recently certified	Certification end date
1	Ayurved School (before being transferred to the Faculty of Medicine Siriraj Hospital, Mahidol University)	Cert. HVEd.	1987	Operation ended	-
2	Center of Applied Thai Traditional Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University	BATM	2003, 2005, 2007, 2013	30 Dec 2014	29 Dec 2016
3	Center of Applied Thai Traditional Medicine, Faculty of Medicine, Thammasat University	BATM	2005, 2007, 2013		
4	Kanchanaphisek College of Medical and Health Technology, Praboromrajchanok Institute, MoPH	Cert. HVEd.	2006	Operation ended	-
5	Thai Traditional Medicine College, Rajamangala University of Technology Thanyaburi	BATM	2007, 2008, 2013	30 Dec 2014[#]	29 Dec 2016
6	Faculty of Abhaibhubejhr Thai Traditional Medicine, Burapha University	BATM	2007, 2011		
7	College of Allied Health Sciences, Suan Sunandha Rajabhat University	BATM	2007, 2012		
8	School of Health Science, Mae Fah Luang University	BATM	2007, 2009		
9	Faculty of Medicine, Maha Sarakham University	BATM	2007, 2009, 2013		
10	Faculty of Public Health, Naresuan University	BATM	2008, 2013		
11	Faculty of Medicine, University of Phayao	BATM	2014		

Note: Cert.HVEd. = Certificate of Higher Vocational Education
BATM = Bachelor of Applied Thai Traditional Medicine

As for the ATM workforce production at the nine institutes certified by the TTM Council, the DTAM's survey of February 2016 shows that out of 4,463 students cumulatively admitted to the ATM programme, 1,353 are still studying and 3,110 have graduated, see Table 3.10.

Table 3.10 Numbers of students admitted to ATM institutions and graduates, cumulative 2016

Number	ATM institutions	No. of students admitted	No. of graduates
1	Faculty of Medicine, Thammasat University	269	142
2	Faculty of Public Health, Naresuan University	404	267
3	Faculty of Abhaibhubejhr Thai Traditional Medicine, Burapha University	380	275
4	Faculty of Medicine, University of Phayao (open 2015)	20	-
5	Faculty of Medicine, Maha Sarakham University	666	506
6	Faculty of Medicine Siriraj Hospital, Mahidol University	802	503
7	School of Health Science, Mae Fah Luang University	583	398
8	Thai Traditional Medicine College, Rajamangala University of Technology Thanyaburi	619	563
9	College of Allied Health Sciences, Suan Sunandha Rajabhat University	720	456
Total		**4,463**	**3,110**

Source: Office of Information and Knowledge Bank, DTAM, February 2016.

In summary, for both TTM and ATM programmes, out of a total of 11,034 students cumulatively admitted, 4,502 are still studying and 6,532 have graduated. However, there have been no systematically collected follow-up data on the graduates' workplaces and their passing of licensing examination.

3) Workforce distribution

The Office of Regional Health Support and Special Project Administration (of the MoPH's Department of Thai Traditional and Alternative Medicine) has conducted a survey on TTM personnel distribution in state health-care facilities, especially those working under the MoPH's Office of the Permanent Secretary and the Bangkok Metropolitan Administration (BMA). The personnel include TTM practitioners, ATM practitioners, TTM assistants and TTM care-providers.

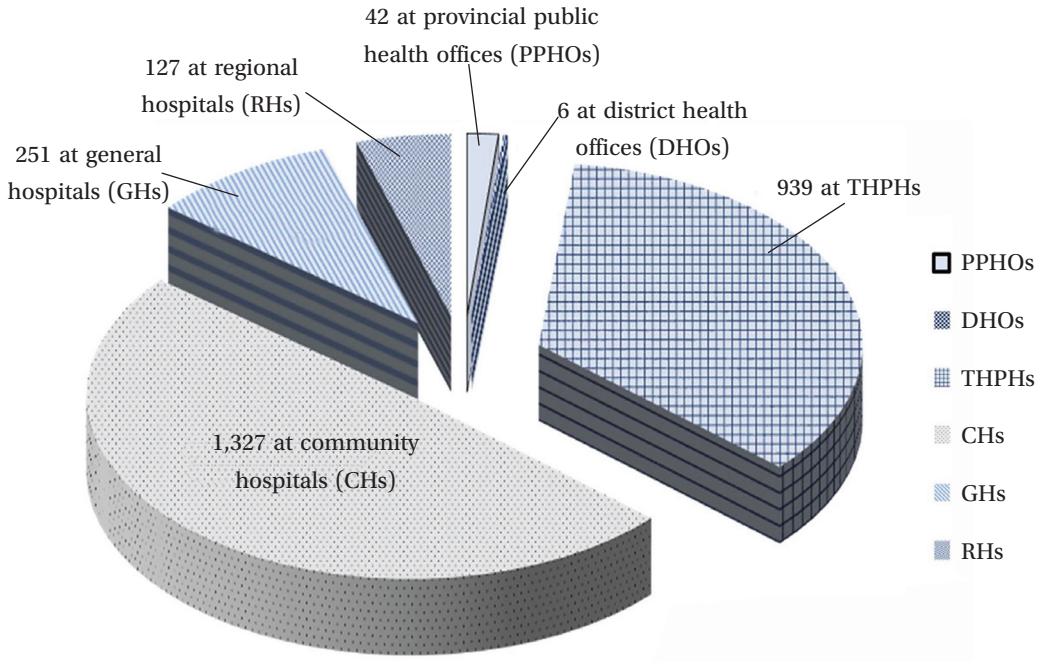
Table 3.11 Number of TTM personnel at health-care facilities by health region, 2016

Health region	TTM/ATM practitioners				TTM assistants			Care-providers	Total
	Civil servants	State officials	MoPH officials	Employ-ees	330/372 hrs	800 hrs	1,300 hrs	<150 hrs	
1	123	0	67	51	850	10	1	54	1,156
2	75	0	42	66	457	1	0	37	678
3	63	2	31	39	546	5	1	14	699
4	80	4	30	65	828	6	0	39	1,052
5	97	5	34	73	768	9	7	36	1,029
6	116	2	59	109	559	11	14	54	924
7	71	2	63	22	692	4	0	45	899
8	103	4	84	96	889	4	2	18	1,200
9	111	0	83	34	1,103	0	1	1	1,333
10	134	2	40	50	898	21	7	12	1,164
11	82	5	64	132	365	25	2	26	701
12	83	2	74	87	465	7	1	11	730
13	2	0	6	23	25	3	0	11	70
Total	**1,140**	**28**	**677**	**847**	**8,445**	**106**	**36**	**358**	**11,635**

Source: Department of Thai Traditional and Alternative Medicine, February 2016.

Of all 2,692 TTM/ATM practitioners working in MoPH health-care facilities, most of them (1,327) work at community hospitals, followed by 939 at *tambon* (subdistrict) health promoting hospitals (THPHs), see Diagram 3.11.

Diagram 3.11 Number of TTM/ATM practitioners working at health-care facilities



Source: Department of Thai Traditional and Alternative Medicine, February 2016.

4) Workforce loss

As there is no system for data collection and reporting on working situations or characteristics of TTM practitioners under Section 12(2)(b), the information on this matter is not available.

3.4 TTM health-care facilities

In Thailand, there are three major health insurance schemes, namely:

A. Universal Health Coverage Scheme (UCS, or UHC scheme), covering 48.8 million people, or 75% of total population.

B. Social Security Scheme (SSS), covering 13 million people, or 20% of total population.

C. Civil Servant Medical Benefit Scheme (CSMBS), covering 5 million people, or 5% of total population.

A. Universal Health Coverage Scheme

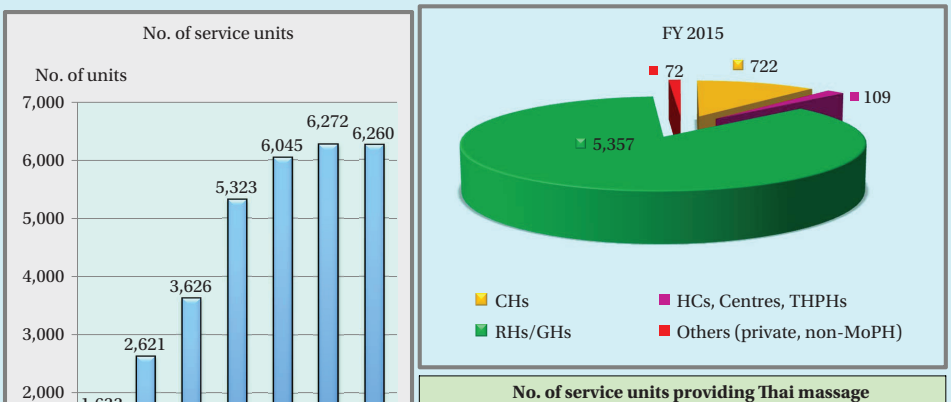
1) Situation and trends of TTM health-care facilities

Since 2007, TTM services have been provided to the people under the UCS; and the National Health Security Office (NHSO) has set up the TTM Fund to pay the contracted units for primary care (CUPs) for additional TTM services. As a result, more than 80% of CUPs especially regional, general and community hospitals, and 50% of *tambon* or subdistrict health promoting hospitals have been providing TTM services.

2) Distribution of TTM health-care facilities

For regional, general and community hospitals, as well as *tambon* or subdistrict health promoting hospitals, TTM services including massage, steam bath and herbal compress are available in 94.87% of CHs, followed by 80.34% of RHs/GHs, and 52.24% of THPHs. That means TTM health-care facilities are distributed in all geographical areas at all primary, secondary and tertiary levels of health care.

Diagram 3.12 Number of health-care facilities (units) providing Thai massage services by type of service unit, 2015



No. of service units providing Thai massage

Type of units	Total no. of units	Units providing massage	Percent
CHs	761	722	94.87
RHs/GHs	117	109	80.34
THPHs/centres	10,254	5,357	52.24

Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Table 3.12 Number of health-care facilities (units) under the SSS, 2013–2016

Year	No. of contracted units for primary care			Network heath-care facilities
	Public (state)	Private	Total	
2013	154	87	241	2,220
2014	156	85	241	2,234
2015	157	84	241	2,234
2016	158	82	240	2,325

Source: Medical Service System Management Bureau, Social Security Office (SSO), 2016.

B. Social Security Scheme

Under the SSS, there are no reports on TTM services provided by health-care facilities or units as it is up to each unit to organize such care; and there is no policy or measure to support and promote such services. As a matter of fact, it can be said that there are no TTM services at SSS-related health-care facilities for SSS-insured persons.

C. Civil Servant Medical Benefit Scheme

Under the CSMBS, the Comptroller General's Department has a mechanism to promote and support TTM services, so civil servants can get reimbursed for TTM services they have received. Therefore, state health-care facilities can provide TTM services chiefly for civil servants. The information on TTM health-care facilities can be seen in the section on Universal Health Coverage Scheme.

3.5 Access to and utilization of TTM services

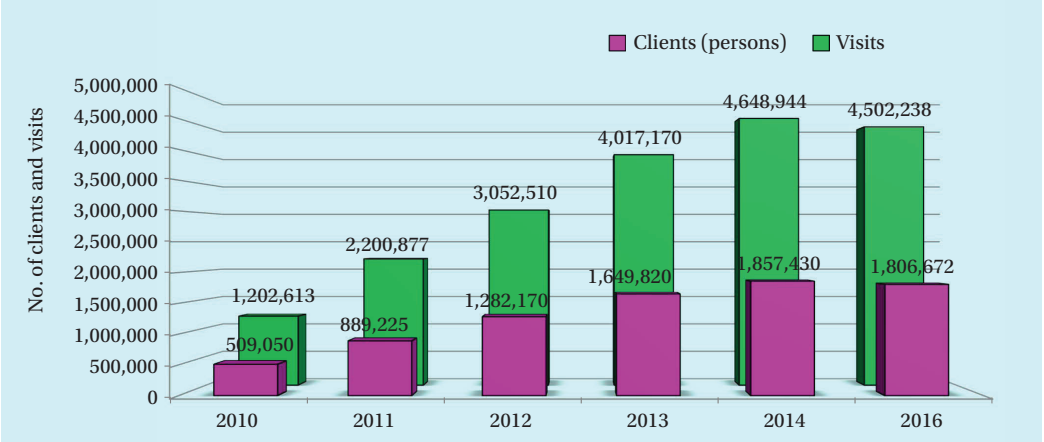
A. Universal Health Coverage Scheme

In 2007, the NHSO established the TTM Fund to allocate additional budget to the CUPs that provide TTM services to UCS eligible persons, especially for massage services for relieving aches/pains and rehabilitating stroke patients. Later on in 2010, massage practice guidelines were prepared for postpartum women; and in 2011, additional funding was allocated for TTM medications with herbal drugs/products in the National List of Essential Medicines (NLEM).

1) Access to Thai massage services

Statistics on Thai massage services between 2010 and 2015 showed that the number of massage clients rose rapidly, from 509,050 (1,202,613 visits) in 2010 to 1,806,672 (4,502,238 visits) in 2015, clearly reflecting the fact that the financial support for TTM services has resulted in an increased access to Thai massage services.

Diagram 3.13 Numbers of Thai massage clients and visits in FYs 2010–2015



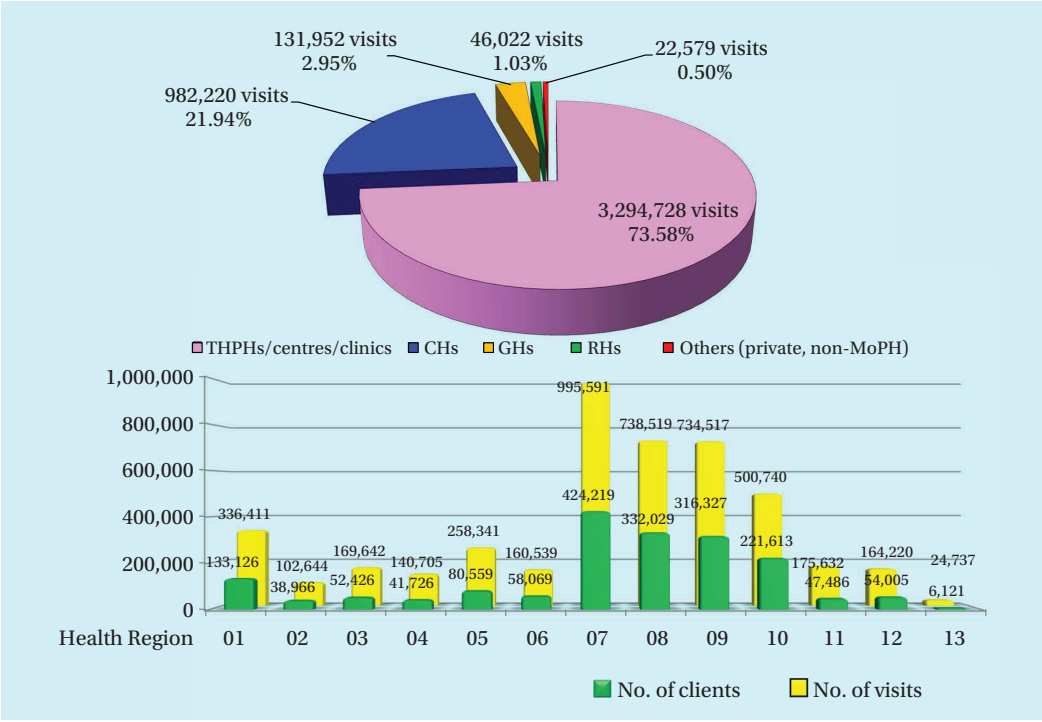
	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Population under UCS	47,729,516	48,116,789	48,620,104	48,593,031	48,312,428	48,336,321
Thai massage clients	509,050	889,225	1,282,170	1,649,820	1,857,430	1,806,672
Percent	1.07	1.85	2.64	3.40	3.84	3.73

Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Regarding the distribution of Thai massage services (massage, herbal compress, and herbal steam bath) in FY 2015 by health region, the numbers of service visits were lowest at 24,737 in Region 13 (Bangkok), and highest at 995,591 in Region 7 (Khon Kaen, Kalasin, Maha Sarakham, and Roi Et). By type of health-care facilities, the proportion of services in state/non-MoPH and private health units was lowest at 0.50%, while the proportion at THPHs/centres/clinics was highest at 73.58%.

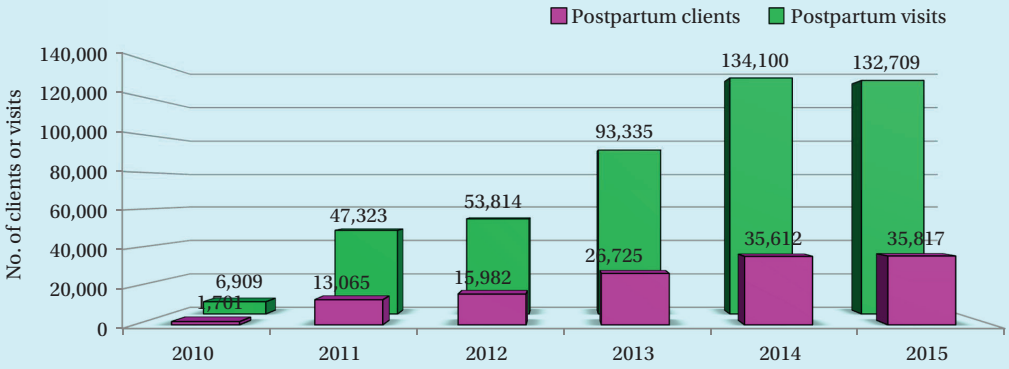
Thus, an analysis should be undertaken to determine how to encourage the UCS population in various regions, especially Bangkok, to have access to such services.

Diagram 3.14 Numbers of Thai massage clients and visits (massage, herbal compress, and herbal steam bath) in FY 2015



Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Diagram 3.15 Number of mothers receiving postpartum care in FYs 2010–2015



FY	No. of clients	No. of visits	Average (visits/person)
2010	1,701	6,909	4.06
2011	13,065	47,323	3.62
2012	15,982	53,814	3.36
2013	26,725	93,335	3.49
2014	35,612	134,100	3.76
2015	35,817	132,709	3.70

Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

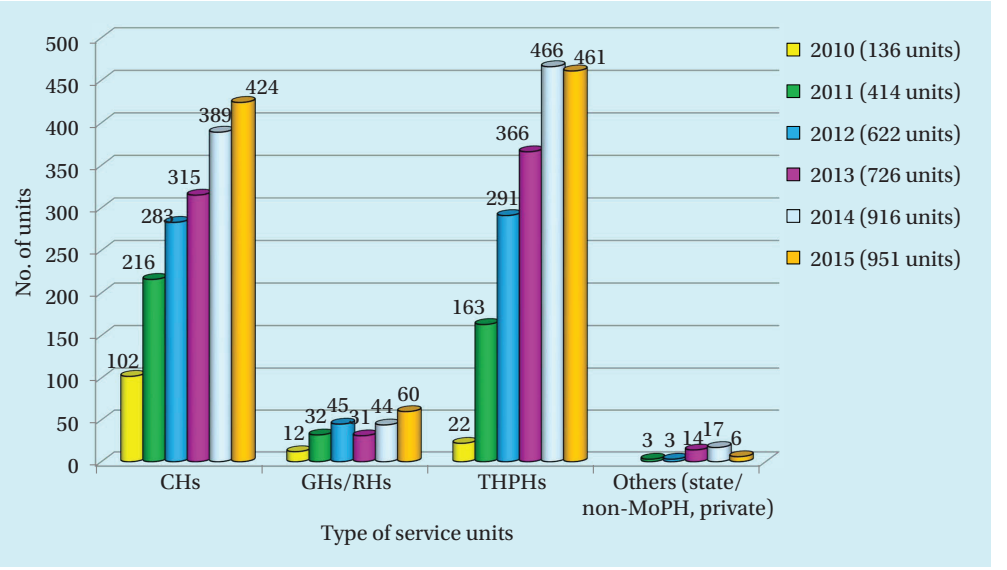
2) Access to postpartum care

It was found that, between 2010 and 2015 the number of mothers receiving postpartum care rose from 1,701 (6,909 visits) to 35,817 (132,709 visits) – a six-fold increase for the entire period, or an annual average increase of 1.5-fold.

Besides, according to an analysis of postpartum service unit distribution during 2010–2015, the number of such service units rose significantly each year, resulting in the clients' easier access to such units, see Diagram 3.16.

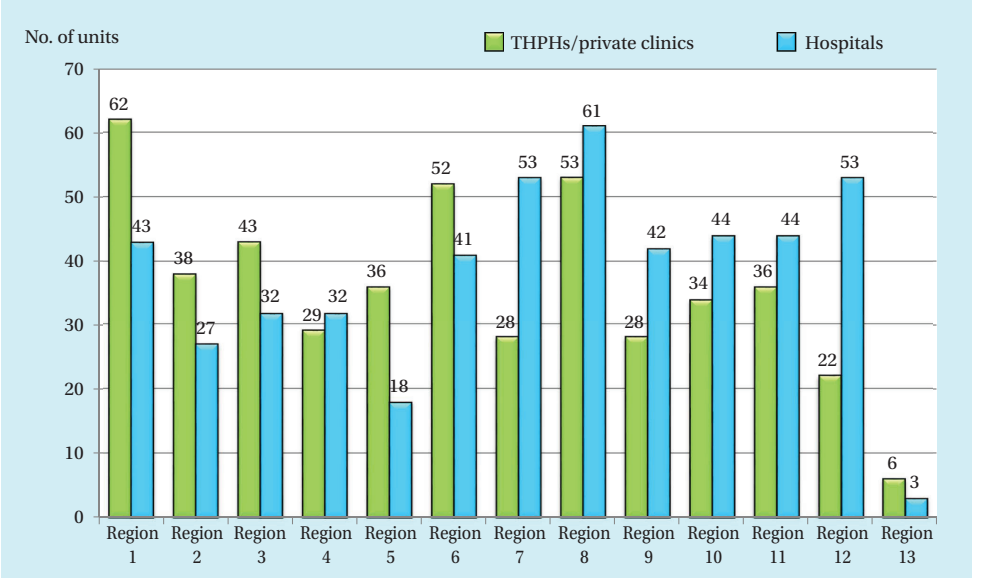
When analyzing the service unit distribution in all 13 health regions in FY 2015, it was found that the number of THPHs/private clinics was largest at 62 in Region 1, followed by Region 8 with 53 units. The number of hospitals was largest at 61 in Region 8, followed by 63 each for Regions 7 and 12, see Diagram 3.17.

Diagram 3.16 Number of service units providing postpartum care by type of units in FYs 2010–2015



Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Diagram 3.17 Number of service units providing postpartum care by health region in FY 2015



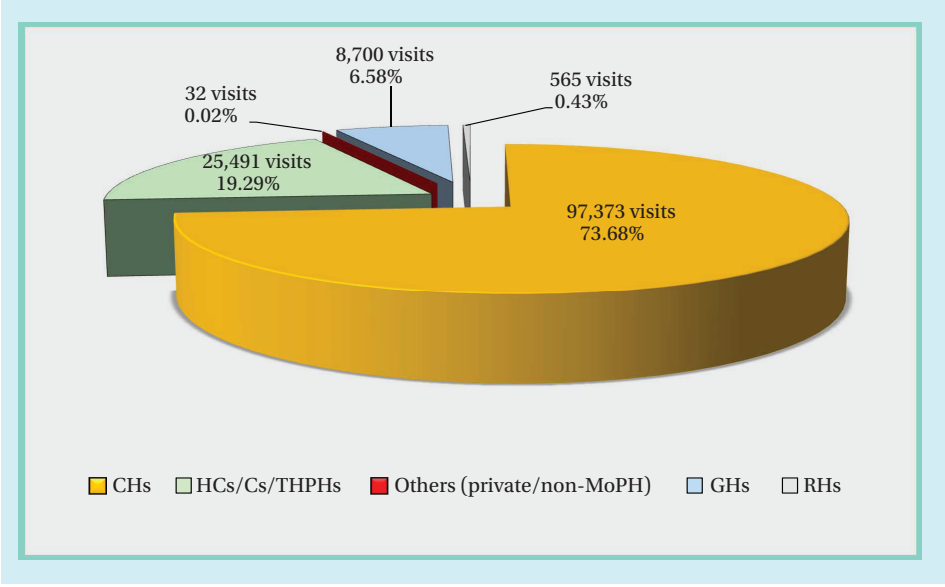
Source: Information system: h*ttp://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Regarding the access to postpartum services at health-care facilities or units in FY 2015, the proportion of mothers receiving postpartum care at community hospitals was highest at 73.68%, followed by health centres/centres/THPHs at 19.29%, see Diagram 3.18.

3) Access to herbal drugs in the National List of Essential Medicines in Thai medicine

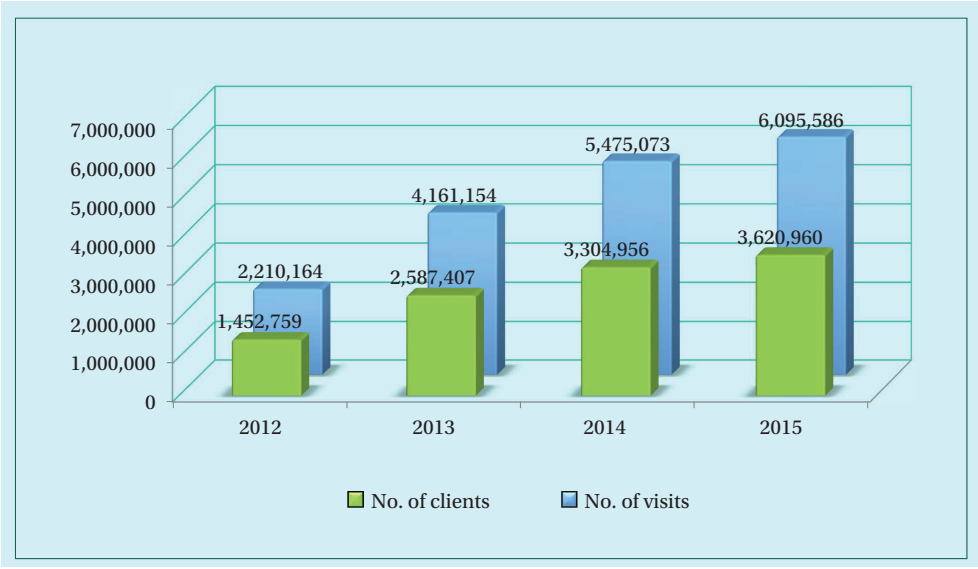
Since 2011, when the support for herbal drug use began, the quantities of NLEM herbal drug use have been rising steadily. From 2011 to 2012, the number of patients having access to herbal drugs rose more than twofold, or by 59.88%, see Diagram 3.19.

Diagram 3.18 Number of mothers' postpartum care visits by type of health-care units in FY 2015



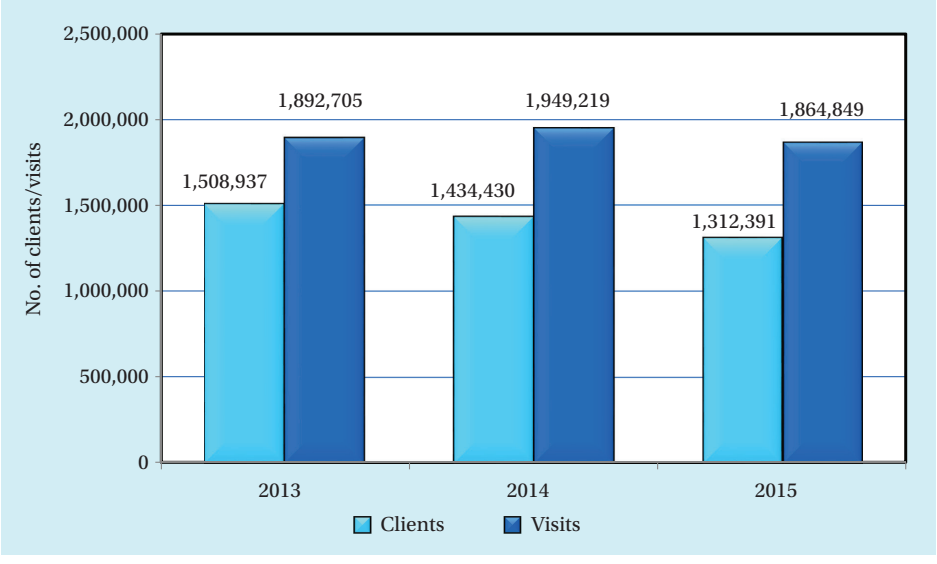
Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Diagram 3.19 Numbers of clients and visits with the use of NLEM herbal drugs in 2012–2015



Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Diagram 3.20 Numbers of clients and visits at TTM clinics in FYs 2013–2015



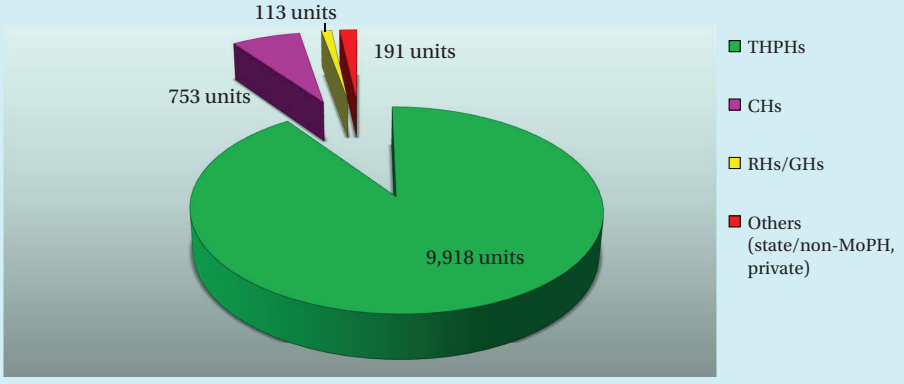
Source: OP/PP Individual Data, excluding BMA, 30 September 2015.

Since 2013, TTM and ATM practitioners have been supported to use their knowledge in making a diagnosis before giving treatment procedures to TTM clients, and since 2014 a policy has been set for providing TTM services at OPDs in state hospitals (parallel OPD), see Diagram 3.20.

In 2015, at all 10,356 health-care facilities or units prescribing NLEM herbal drugs, the proportion of community hospitals with such prescriptions was highest, followed by *tambon* (subdistrict) health promoting hospitals and regional/general hospitals, at 98.02%, 92.68% and 90.59%, respectively.

In FY 2015, the proportion of NLEM herbal drug prescriptions was 61.22% (6,095,586 prescriptions) and that of non-NLEM herbal drug prescriptions was 38.78% (3,860,928 prescriptions). The top five mostly prescribed herbal drugs were turmeric (*khaminchan*), *ma-waeng* lozenges, *fa-thalai-jon* (kariyat), *prasa-mawaeng* (brinjal), and Indian gooseberry or *ma-kham-pom* cough lozenges, see Diagram 3.22.

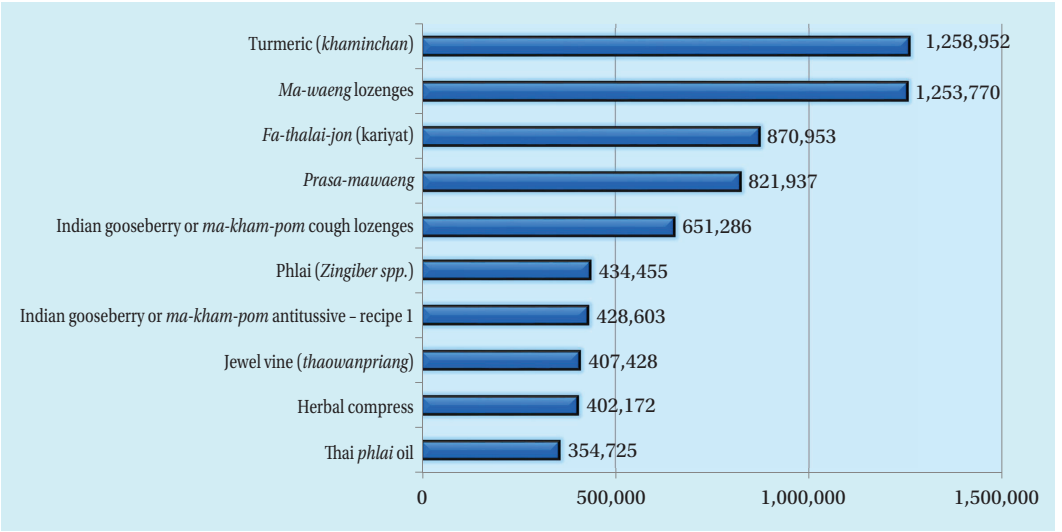
Diagram 3.21 Numbers of health-care facilities or units prescribing NLEM herbal drugs by type of units, 2015



Type	Total no. of units	Units prescribing herbal drugs	Percent
THPHs/centres	10,254	9,504	92.68
CHs	761	746	98.02
GHs/RHs	117	106	90.59

Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund), BMA, from OP BKK Claim, 30 September 2015.

Diagram 3.22 Top 10 mostly prescribed herbal drugs in the National List of Essential Medicines, FY 2015



Source: Information system: *http://dw.nhso.go.th/dw* (H0401, reports on management support services for the UHC Fund).

B. Social Security Scheme

Under the SSS, reports on health-care utilization when ill include the number of patient visits to health-care facilities or units for both inpatient and outpatient care, or emergency medical care. According to the statistics of the Social Security Fund, the numbers of medical care visits of SSS-insured persons were 32.83 million, 28.64 million, and 29.93 million in 2013, 2014 and 2015, respectively. But there were no details on the types of medical services; and no reports on TTM services were available.

C. Civil Servant Medical Benefit Scheme

The Central Office for Healthcare Information is responsible for developing the healthcare information system for use by health-care facilities efficiently and the CSMBS reimbursement system from the Comptroller General's Department. It supports the NHSO in managing the information on payments for inpatient medical care costs, through networking with various hospitals in sharing medical or healthcare information. The Office's report does not contain any data on the types of medical care for civil servants; and there is no information on TTM service utilization.

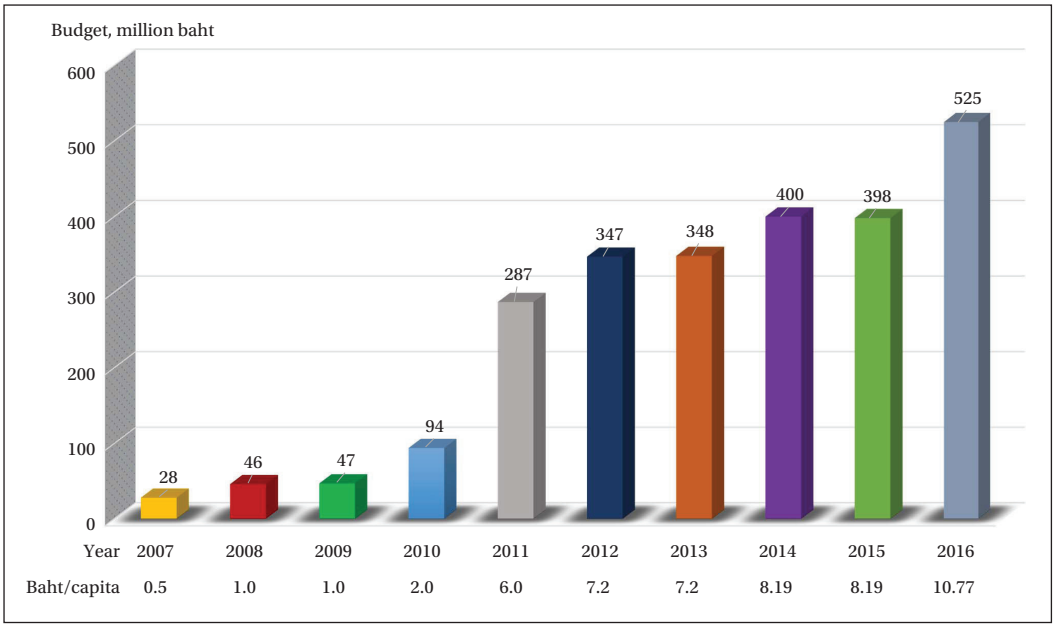
3.6 Expenditure and budget for Thai traditional medicine

A. Universal Health Coverage Scheme

The NHSO established the TTM Fund in 2007 to make additional payments to CUPs for TTM services provided to UCS members/clients. The additional payments are made to the CUPs that provide Thai massage services for relieving aches/pains and the rehabilitation of stroke patients. Later on, additional money has been allocated for Thai massage services for postpartum women since 2010, and for NLEM herbal drug prescriptions since 2011.

The budget allocation under the TTM Fund began at 0.50 baht per capita in 2007, totalling 28 million baht, and rose to 10.77 baht per capita in 2016, totalling 525 million baht, a 19-fold increase in 10 years, see Diagram 3.23.

Diagram 3.23 Budget allocations for TTM services in FYs 2007–2016



Source: National Health Security Office, August 2016.

Regarding the amount of money that the NHSO allocates to cover TTM services, the global budget includes the allocations based on the number of UCS eligible persons, the performance of TTM services, and the number of TTM service units. In FY 2015, the total global budget for TTM services was 398.08 million baht, of which the largest proportion of 51.51 million baht (12.94%) was allocated to Health Region 9, followed by 44.83 million baht (11.26%) for Health Region 8, see Table 3.13.

Table 3.13 Global budget allocated by the NHSO for TTM services to each health region, FY 2015

Health Region	Budget allocation (baht) based on			Total (baht)
	UCS population	Performance	No. of service units	
1	13,656,594	8,445,007	13,264,046	35,365,647
2	8,635,226	2,786,819	5,902,886	17,324,931
3	7,604,511	4,614,255	7,442,358	19,661,124
4	10,936,382	3,601,937	9,020,638	23,558,957
5	12,516,765	6,625,761	8,271,041	27,413,567
6	13,240,570	5,416,124	9,804,788	28,461,482
7	12,400,938	21,853,631	10,237,170	44,491,739
8	14,142,483	19,300,457	11,384,159	44,827,099
9	16,742,135	22,207,012	12,558,250	51,507,397
10	11,567,681	13,279,147	10,309,130	35,155,958
11	11,593,255	5,385,993	8,982,074	25,961,322
12	13,195,203	4,413,384	9,534,799	27,143,386
13	13,001,513	1,495,415	2,713,603	17,210,531
Total	**159,233,256**	**119,424,942**	**119,424,942**	**398,083,140**

Source: National Health Security Office, 2016.

As for FY 2016, the global budget allocated for TTM services by the NHSO was totally 525.43 million baht, of which the largest proportion of 66.11 million baht (12.58%) was allocated to Health Region 9, followed by 59.85 million baht (11.39%) for Health Region 7, see Table 3.14.

Table 3.14 Global budget allocated by the NHSO for TTM services to each health region, FY 2016

Health Region	Budget allocation (baht) based on			Total (baht)
	UCS population	Performance	No. of service units	
1	17,983,733	10,652,496	17,801,289	46,437,518
2	11,355,444	3,530,893	6,765,589	21,651,926
3	9,964,831	6,364,183	9,520,166	25,849,180
4	14,738,701	4,709,693	13,021,448	32,469,842
5	16,578,598	7,994,839	12,887,874	37,461,311
6	17,679,169	7,823,416	13,898,121	39,400,706
7	16,287,020	30,125,580	13,430,979	59,843,579
8	18,595,645	23,770,659	14,810,009	57,176,313
9	22,017,943	29,393,209	14,702,415	66,113,567
10	15,179,437	17,696,426	14,211,995	47,087,858
11	15,322,412	6,621,917	12,371,381	34,315,710
12	17,484,337	8,267,114	12,760,854	38,512,305
13	16,987,126	680,372	1,448,677	19,116,175
Total	**210,174,396**	**157,630,797**	**157,630,797**	**525,435,990**

Source: National Health Security Office, 2016.

B. Social Security Scheme

The SSS has no system for reporting the types and numbers of TTM services provided by health-care units for its insured persons. It is regarded that such service provision is arranged by each health-care unit; and there is no policy or measure for supporting TTM services under the SSS, which is different from that under the UCS.

C. Civil Servant Medical Benefit Scheme

Under the CSMBS, there is a system for reporting the types and numbers of TTM services by health-care units in the 43-file standard data set, but it does not include funding disbursement data for TTM/AM services.

However, some data are found related to the disbursement of medical expenses of civil servants of the Central Office for Healthcare Information for part 15, reimbursements of acupuncture and other treatment fees for other licensed medical practitioners. But the TTM service fees cannot be specifically segregated.

Chapter

4

One Decade of Indigenous Medical Knowledge Management

4.1 Introduction

The idea of local/indigenous knowledge or wisdom has been brought back to the public's attention by NGOs working on community culture. They have synthesized lessons learned from their work in community development using the community participation approach. They have found that culture is the main driving force behind the development. In their working process, they have identified people behind the rehabilitation and security of each community through changing times. These people are called "local philosophers" or "local gurus" and the wisdom in use is called "local wisdom" or "indigenous wisdom".

Health-related indigenous wisdom is the culture of health care and treatment which varies among different ethnic groups and sub-cultures. It is both science and art derived through experiments, selection, screening, and compilation, and thereafter transferred to the future generations. It reflects the thinking system, beliefs and lessons in health care as well as life in general. Indigenous wisdom involves simple and accessible knowledge and technology which enable people to look after their health. This is the concept of health care under the philosophy of sufficiency economy.

The revival of health local wisdom in the health system by the Ministry of Public Health (MoPH) and non-governmental organizations (NGOs) two decades ago marked an important change. Health care management now has room for other fields of knowledge. It allows traditional medicine, although not classified as medical science or biomedicine, to have its role in Thailand's primary health care.

4.1.1 Revival of health local wisdom in the health system

The adoption of "primary health care" policy for community health development in the Health Development Plan, under the 4th National Economic and Social Development Plan, is evidenced in the promotion of herbal use in the MoPH's Primary Health Care Programme. Over the past two decades, technical as well as research and development (R&D) efforts in this regard have been made around three issues as follows:

1) Indigenous system of health and wellness maintenance, using the knowledge for the benefit of Thai society to lead a normal and balanced life.

2) Indigenous self-healthcare with the knowledge for self-care and treatment for family members or relatives, with no or little dependence on other community members, such as postpartum care, household remedies, or massage.

3) Indigenous or folk medicine: the wisdom or technology is primarily used by "indigenous or folk healers", who work in connection with the ecosystem as well economic and specific cultural systems, in the social, cultural, and ecological context of local wisdom, which involves a situational knowledge that evolves according to different situations. The compilation of lessons learned, learning procedures, as well as health-care methods related to area-based context has been forged and developed into community health culture as its identity. We have learned that each society or each ethnic group has more than one simple method of health care. It is necessary to identify both internal and external conditions and factors in order to fully and holistically understand health care and treatment of each group.

4.1.2 Definition: Indigenous medicine (IM)

1) Indigenous Medicine

"*Karn Paet Puen Baan*" is an officially recognized Thai term equivalent to the terms "indigenous medicine" or "folk medicine" which is part of health-related local wisdom and community health care. The knowledge and practices of indigenous medicine coincide with local culture. With its uniqueness, indigenous medicine which adapts continuously can be combined and integrated with other types of medical practice. The knowledge of indigenous medicine has also been transferred through direct experiences with lessons learned from a series of practice under a specific culture.

Thai indigenous medicine is closely related to Thai traditional medicine (TTM). While Thai traditional medicine has been systematically developed with governing law and clear standards of practice, Thai indigenous medicine is still in its beginning with its characteristics as cultural medicine where life, nature, and paranormality meet. Thai indigenous medicine is utilized by the people who have developed the thinking system together with the value system. Practices are carried out in various dimensions. All these have led to knowledge and procedures that are in harmony with life, both in the times of illness and daily self-healthcare. Thai indigenous medicine is both factual and can be proven by facts in ways that are similar to and different from scientific methods and Thai traditional medicine.

The Announcement of the TTM Professional Committee No. 1, B.E. 2547 (2004) has defined Thai indigenous medicine as health care using the knowledge passed on in the community in harmony with local views, beliefs, traditions, culture and resources within in each community.

Thai indigenous medicine therefore involves the development and use of health-related wisdom in several dimensions with diversities in different ethnic groups; such as *Lanna* (Northern) Indigenous Medicine, *Esan* (Northeastern) Indigenous Medicine, Southern Indigenous Medicine, Muslim Indigenous Medicine, or health wisdom of different ethnic groups; such as Hmong, Yao/Mien, Lisu, Akha, Karen, Lua, Khmu, Tai Yai, Tai Lu, Mon, Tai Dam, Tai Esan, Phu Thai, Khmer, Sakai, and Lahu. This also includes postpartum knowledge, mental/spiritual support, and local food recipes. Interested health-care professionals or outsiders must be

willing to learn about these health-related local faiths in order to avoid dominating or destroying the value and original characteristics of Thai indigenous medicine.

2) Folk Healers

"Folk healers" play an important role in employing indigenous wisdom in the treatment and care of patients in the community. In order to know and learn about them, we might ask, "Who is this community's folk healer?" In a traditional community, folk healers lead their lives the same way other villagers do. They can be monks or farmers with health-care knowledge and skills to look after other people in the community. They often help find solutions to frequently found health problems in the community. Currently, there are many types of folk healers.

Those who have the qualifications to be certified and are supported to practise in the community health service are those with high morality and competent treatment skills in caring for patients in the community. They do not take advantage of, or cheat, other fellow villagers in and outside the community. We can notice the characteristics of a folk healer with good intentions and willingness to help others as follows:

The characteristics found in good folk healers are kindness and compassion. They look after both mental and physical health aspects of patients. These healers have been trained through apprenticeship by relatives or senior folk healers. They had the experience of self-healthcare and were later interested in further studies in order to be self-reliant as well as to help others. Some of them may be inspired by "higher force". There are two main types of folk healers. The first type includes those who have learned and trained from years of practice such as herbalists, massage therapists, traditional birth attendants (TBAs), bone setters, snakebite healers, and fortunetellers. They may also have studied further from local medical handbooks or palm-leaf manuscripts as well as one or several folk healers. The second type includes those who have been able to cure specific illnesses which may be caused by an event or a phenomenon. This is according to the faith and belief of each community. The treatment usually involves communication with paranormal force (ghosts and holy spirits) and rituals. Examples of these healers are spirit-mediums (*khonsong*), *Esan Phi Fah* dancers and ritual performers, "*Moh Khwan*" or faith healers, in several ethnic groups, "*Moh Yao*" of Phu Thai ethnic group, and "*Jol*

Ma Muad" in the Thai-Khmer ethnic group. Some healers even have skills for both physical and mental illnesses.

Folk healers are grateful to their teachers and are very strict in the rituals to honour them. Before starting each treatment, healers always perform a teacher-honouring ceremony in recognition of the knowledge they have gained from them. Patients have to prepare flowers, incense sticks, candles, and a small sum of money as determined by the healers (1.5, 6, or 12 baht) for the ceremony in memory of the teachers who have taught them the art of healing. The ritual is also meant to ask for blessings for the success of the treatment and protection from their teachers. After being healed, the patients will perform a particular ceremony called "*Song Khwan Khao*" in central Thailand to show their gratitude towards the healers and their teachers. In other regions, the ritual is referred as "*Pong Khai*" in the Northeast, "*Tang Rad*" in the South, and "*Khan Tang*" in *Lanna* or the North. The treatment cost is determined by the patients, not the healers, according to their financial status.

Ethical and trustworthy indigenous healers are well respected and trusted by community members. These healers have their roles in socio-cultural context. Their ideology, values and practices are in harmony with the community. Folk healers are those who are willing to help and care for patients. For this reason, the community respects the folk healers as they are always eager to help those with illnesses and in pain. They are not boastful and do not cheat. If they do not have the ability to cure a certain illness, they will frankly tell the patient. Some elderly or experienced folk healers do not mind if they do not obtain a practitioner licence.

An ideal folk healer does not expect payment in the form of money. However, with the change of society, elderly folk healers need to pay for living expenses as well as herbs or other equipment used for medical treatments and procedures. Therefore, some may charge their patients for treatments or medicines at a reasonable amount to make up for the cost, not aiming to gain profit.

4.2 Policy development

4.2.1 Legal situation and related issues

(1) The Practice of the Art of Healing Act B.E. 2542 (1999), or 1999 Healing Arts Practices Act. Section 33(1)(c) of the law allows for the evaluation of folk healers aged 20 years and over with knowledge and experience in community health practice to be granted a licence to practice the healing arts. During 2004–2009, 44 folk healers passed the evaluation.

During the period 2010–2011, the then minister and deputy minister of public health set a policy to support the use of local wisdom and herbs in public health services. Under the policy, the Bureau of Thai Indigenous Medicine of the Department of Thai Traditional and Alternative Medicine (DTAM) and the Bureau of Sanatorium and Art of Healing of the Department of Health Service Support carried out the evaluation of some indigenous healers; 117 of whom passed the evaluation and were licensed to practise.

(2) The National Health Security Act B.E. 2545 (2002). Section 18 (8) of the law supports liaison with local government organizations (LGOs) to set up local health security systems as appropriate, according to their needs. This effort is aimed at creating participation to build health security for local residents through a subdistrict health security fund.

(3) The National Health Act B.E. 2550 (2007). In accordance this law, the Statute on National Health System of 2009 has been passed and Part 7 of the Statute deals with the promotion, support, use and development of local health wisdom, Thai traditional medicine, indigenous medicine, and other alternative medicines. Section 64 of the Statute stipulates that all relevant government agencies should take part in the development of legal and other measures to certify the status of indigenous healers.

(4) The Protection and Promotion of Traditional Thai Medical Knowledge Act B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, and development of indigenous medicine.

The law stipulates that MoPH's Department of Thai Traditional and Alternative Medicine (DTAM) carries out operations to protect and promote education, training, and studies/research on TTM wisdom or knowledge and herbs or medicinal plants. The department must also oversee administrative and academic work of the Committee on TTM Protection and Promotion. According to Section 13 of the Act, the Director-General of DTAM shall be the Central Registrar and the Provincial Chief Medical Officer shall be the Provincial Registrar (of each province). And Section 15 prescribes that DTAM is responsible for compiling information on TTM wisdom, Thai drug recipes or formulas, and TTM textbooks from across the country for establishing a TTM wisdom registry.

The aforementioned registry must contain at least (1) the origin of the TTM wisdom, (2) the name of the owner of the TTM wisdom, and (3) the details of the TTM wisdom, TTM drug formulas, TTM textbooks, and drug properties, without any intention to disclose the drug formula and its preparation process, which is personal property right.

The information on indigenous healers is part of the TTM personnel database. There are 50,591 indigenous healers according to the registry data in December 2010. These healers are classified into six groups according to their specialties: ritual healers, herbal healers, massage therapists, traditional birth attendants (TBAs), bone setters and others. These healers are valuable in two ways: First, they are experienced health personnel working in the community. Second, their tacit knowledge and experience are not recorded in writing. Thus, to protect this kind of wisdom, besides surveys and registration, it is also necessary to have plans to support and develop such capacity. This should be done without delay since most of the skilled folk healers are elderly persons.

(5) Guidelines for the certification of indigenous healers in the health system. The certification of indigenous healers is done under at least two laws: the 1999 Healing Arts Practices Act and the 1999 TTM Knowledge Protection Act, and in accordance with the mission statements of DTAM regarding the certification of indigenous healers No. 1, B.E. 2554 (2011) and No. 2, B.E. 2555 (2012) in all provinces. This process certifies the status of healers with knowledge and skills so that they can participate in community health care, especially community self-care.

It is noteworthy that such laws deal with the reforms of health-care system and state administration, especially decentralization, which can be used in issuing local ordinances or regulations related to the use of indigenous medical wisdom for community health services and various forms of integrative care as well as referral systems for primary care units and the communities.

4.2.2 Academic movements: TTM teaching/learning in academic institutes and the knowledge management of indigenous medicine

The importance of the implementation of indigenous medical services is the conservation and accumulation of knowledge and experiences by folk healers, in close relation with their own community. It is achieved through the social networks of local scholars, culture, tradition, and ecosystem. Indigenous medical knowledge has two features: sacred and secular sub-sectors. This makes it a unique set of knowledge that has an important role in health care for the Thai people, independent of the mainstream medical practice, but interconnected and leading to the development of systematic use of indigenous medicine.

Under the 1999 TTM Knowledge Protection Act, the DTAM is in charge of documenting knowledge and information regarding Thai indigenous medicine. According to DTAM's Central Registrar's Office, Thailand has 55,665 registered folk healers (as of May 2016). Between 2011 and 2012, the DTAM and the Department of Health Service Support carried out the second phase of the R&D project on the certification of folk healers' legal status, by assessing experienced and skilled folk healers by the TTM Profession Committee and its Sub-committee on Thai Indigenous Medicine. This effort led to the certification of 165 folk healers under Section 33(1)(c) of the 1999 Healing Arts Practices Act.

The research has discovered the experience and knowledge or wisdom of well-respected folk healers in various communities which differ in cultural and geographical context. The wisdom can be used in the treatment of illnesses or diseases that cannot be cured by modern medicine with satisfactory results such as diabetes, high blood pressure, cancers, stroke (paralysis/paresis), snakebite wounds, and elderly care. Such conditions are still health problems in the mainstream medical system in Thailand.

This has led to more surveys and research on Thai indigenous medicine. However, the collection of data is relatively slow due to social and cultural limitations in each community, including the knowledge transfer that is kept only in each folk healer's family. According to the Central Registrar's Office (30 April 2014), 558 registered folk healers passed away, 27 of whom were those licensed or certified under the 1999 Healing Arts Practices Act (as of September 2016) . So, indigenous medical knowledge has been lost with folk healers' demise and time.

Thus, an indigenous medical knowledge management project was launched in collaboration with TTM higher education institutions.The objective was to gather and manage tacit knowledge from 1,550 folk healers by TTM students both at the undergraduate and graduate levels. Selected students from 19 institutes were supervised by their advisors, see Table 4.1. These students were potential researchers for the future research projects on indigenous medicine and herbs. The project received financial support from the TTM Knowledge Fund in 2014. In this regard, DTAM held two seminars for the research team and developed interview forms to be used for collecting both qualitative and quantitative data. The research findings will be analyzed and organized into textbooks or electronic database that can be used for further research on herbs and herbal drug formulas. The knowledge will benefit TTM curriculum development as well as the health-care system.





Table 4.1 List of education institutes taking part in the indigenous knowledge management project

No.	Institute	No. of folk healers involved
1	School of Health Science, Mae Fah Luang University	204
2	Sirindhorn College of Public Health, Phitsanulok	10
3	Faculty of Public Health, Naresuan University	50
4	Faculty of Natural Resources, Rajamangala University of Technology Isan Sakonnakhon Campus	50
5	Faculty of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University	200
6	Faculty of Science and Technology, Surin Rajabhat University	100
7	Faculty of Medicine, Mahasarakham University	40
8	Center for Applied Thai traditional Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University	20
9	Kanchanaphisek Institute of Medical and Public Health Technology	112
10	School of Health Science, Sukhothai Thammathirat Open University	25
11	Centre of Applied Thai Traditional Medicine, Faculty of Medicine, Thammasat University	134
12	College of Oriental Medicine, Rangsit University	99
13	College of Thai Traditional Medicine, Rajamangala University of Technology Thanyaburi	50
14	College of Muay Thai Study and Thai Traditional Medicine, Muban Chombueng Rajabhat University	81
15	Abhaibhubejhr College of Thai Traditional Medicine, Prachin Buri	50
16	Faculty of Abhaibhubejhr Thai Traditional Medicine, Burapha University, Chon Buri	150
17	Faculty of Health and Sports Science, Thaksin University, Phattalung	50
18	Faculty of Science and Technology, Rajamangala University of Technology Srivijaya	25
19	Thai Traditional Medicine Programme, Sirindhorn College of Public Health, Yala	100

In the first phase, the knowledge management project took place in 35 provinces in five regions. They are Chiang Mai, Chiang Rai, Nan, Phrae, Lampang, Mae Hong Son, Lamphun, Phitsanulok, Phetchabun, Tak, Sukhothai, Uttaradit, Ang Thong, Sakon Nakhon, Ubon Ratchathani, Surin, Roi Et, Amnat Charoen, Nonthaburi, Pathumthani, Ayutthaya, Saraburi, Samut Sakhon, Nakhon Pathom, Prachin Buri, Nakhon Nayok, Ratchaburi, Chanthaburi, Trat, Phattalung, Nakhon Si Thammarat, Songkla, Narathiwat, Pattani, and Yala. The study has identified seven types of folk healers: (1) masseurs, (2) paresis/paralysis healers, (3) bone healers, (4) midwives, (5) herbal healers, (6) skin healers, and (7) snakebite healers.

As for the next phase, the institutes involved in this study want to continue collecting in-depth knowledge and find out more details on various aspects of indigenous healers for their extended pre-clinical or clinical research in the future. A lot of basic indigenous knowledge still needs to be documented. This requires cooperation with local health personnel, TTM/IM networks, experienced NGOs as well as folk healers' descendants who carry on the craft. This is for indigenous knowledge to be documented and conserved or passed onto future generations.

Epilogue:

The research project, although still on-going until ending in September 2015, has yielded some interesting results:

1. Good cooperation and relationships among TTM/IM partners and between DTAM and TTM academic institutes.

2. TTM lecturers and students involved were motivated to conduct further studies in Thai indigenous medicine in addition to classroom lectures and textbooks.

3. TTM lecturers and students had the opportunity to learn about and share indigenous medical experiences and wisdom as well as diverse cultures, traditions, and rituals from the folk healers.

4. Thai indigenous medical knowledge has been linked to DTAM's Thai Traditional Digital Knowledge Library (TTDKL) database.

4.2.3 Indigenous medicine learning centres: lessons on community health management by folk healers' networks

According to the operational definition of DTAM's Bureau of Thai Indigenous Medicine, "indigenous medicine learning centre" is a community action related to indigenous health and medical wisdom including the revival of indigenous knowledge or wisdom for health care and the transfer of such knowledge to younger members of the community based on the community's social and cultural capital.



The initiative started in 2003 when the Bureau realized the importance of indigenous medicine which involves folk healers, manuscripts, herbs, treatment procedures, culture, traditions, and way of life. All of these should be conserved and documented for future use by younger generations, but most of the communities were found to have no libraries, learning centres, or a venue for the healers to meet and share their knowledge. There should be a public space dedicated to learning on indigenous medicine. It started with what is already available in the community and the management is done by people in the community itself. The working principle is to develop the centre based on the community's experience and potential. The key personnel in the centre included indigenous healers, local scholars, community leaders, and other community-based groups. Based on existing networks and mechanisms, all sectors must participate in the effort to make their community self-reliant and proud in terms of health care.

In the first phase of the project from 2003 to 2004, there were 18 indigenous medicine learning centres in 12 provinces across the country. Each centre was allocated a budget of 30,000 baht to undertake its formation and development activities including searching and surveying to identify potential venues and community members with experiences and skills in indigenous medicine. The

venue was usually chosen from the existing ones such as the healer's house, a nearby temple, a school, a community primary health care centre, or a local charity place. Interviews were conducted to gain insight into the roles and values of local institutes, community organizations, spiritual leaders, senior community members, and indigenous healers. These healers are well-respected for their virtues and knowledge of indigenous medicine. Documentation of data and literature such as manuscripts and texts, as well as observation notes from ritual and social activities was also done; and brainstorming sessions were held as well.

The first stage of community learning centres involved three approaches of learning:

1) Learning from each other through sharing and practice. Some centres had several folk healers, so there were meetings and knowledge-sharing sessions where less experienced healers could learn from their seniors. Study trips were also organized.

2) Knowledge was passed on from folk healers and local scholars to community members or other interested persons. Some learning centres became training sites where healers with specific skills taught and trained interested persons from within and outside the community.

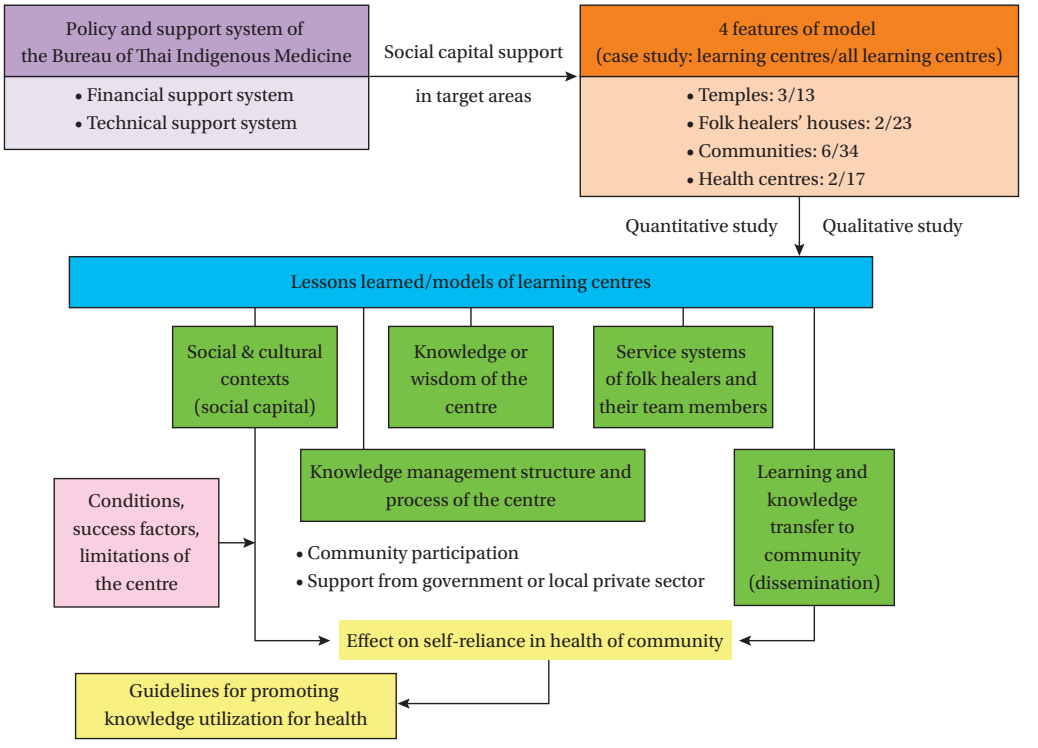
3) The communities benefited from the learning centres as they became health-care centres where community members and other people sought treatment from highly experienced folk healers.

In FY 2005, the Bureau of Thai Indigenous Medicine together with the NorthNet Foundation in Chiang Mai (for community capacity building) and Mahasarakham University's Faculty of Science started the project "One Village, One Massage". The objective was to set up 5 more learning centres in each area, totalling 50 learning centres, with the existing ones (set up in 2004) acting as mentors in enhancing their indigenous massage service capacity. The project also aimed to generate income for the communities as well as improve the service standards for various types of indigenous massage. It targeted indigenous masseurs and interested community members.

The project resulted in in-depth knowledge of 10 types of indigenous massage in different regions and provinces, for example, *Ao-mahn* massage and Red Iron (*Yiap-lek-daeng*) massage in Ayutthaya, *Ched-haek* massage in Chiang Rai, and

Jap-sen massage in Kalasin. Many local government organizations, including provincial and *tambon* (subdistrict) administrative organizations (PAOs and TAOs), or municipalities, have better understanding of, and are more interested in, the project concept; some have given more support to this effort. There has been cooperation between local health personnel and indigenous healers in the utilization of the local wisdom. With more confidence, more people use such indigenous massage services. The healers have also earned more income from providing such services. Most importantly, indigenous massage networks have been established in all four regions of the country and a network committee has been formed, comprising representatives from all regions. This is a management model for the development of health indigenous wisdom.





In 2008, the Bureau of Thai Indigenous Medicine implemented a knowledge management project to empower folk healers and communities with indigenous knowledge. The project looked into the limitations as well as success factors encountered in operating the learning centres. A survey was carried out in 87 learning centres and in-depth interviews were conducted in 13 centres with "best practices", selected from the four regions. They continued their operations from 2004 or 2005 with four various activities, such as providing health-care services, educating community members, and conserving indigenous knowledge. Both in-depth interviews and focus group techniques were used. The findings were used in making recommendations and guidelines for the utilization of indigenous health wisdom for community's self-care, which is in line with the 2007 National Health Act [Section 47(7)] and the 2002 National Health Security Act [Sections 3 and 18(9)].

In 2009, Dr. Lertchai Sirichai from the School of Liberal Arts, Walailak University, made a synthesis and conclusion of lessons learned about the indigenous medicine learning centres during 2003–2008 as follows:

1. **Situations of the learning centres.** There were three groups, i.e.: **(1) The strong group,** including the learning centres with folk healers who had had a long experience in providing several types of health care for a lot of clients. These centres worked on building networks for independent health-care system, emphasizing two major activities: helping members use the wisdom in their way of life and creating networks of folk healers in different areas to expand service coverage and efficiency. **(2) The medium-strong group:** These centres supported themselves with income obtained from offering massage services, but they might not be sustainable as they offered only one type of service. With a good prospect in the beginning, but after awhile, the number of clients was falling. **(3) The adjusting group:** These centres which also offered massage services were usually managed by supporting agencies. They did not have a lot of clients but they were able to stay on with support from other agencies such as state health centres. The centres were adjusting themselves so that they could do more health-care activities. The ratio of learning centres in the three groups was 3:4:6.

2. The definition of "learning centre" can be viewed from different dimensions. In terms of **"services"**, some centres offered medical treatment, some serve as a network cooperating centre, while some aimed to synthesize lessons learned from folk healers. As for the scope of health services, some centres offered only one type of massage service by masseurs trained mostly by a government agency, or only by traditionally trained indigenous masseurs. However, some centres provided integrated massage services based on both formally and indigenously trained skills. Some also applied the knowledge or wisdom acquired from other communities. Some others offered many types of health services; the largest scale with health-care services as well as those for improving quality of life, such as environmental and economic activities. Regarding **"social impact"**, some centres made a high impact on their communities with a variety of health-care services, using integrated knowledge of various branches. Whereas some centres made a specific impact, i.e. the modern medical services having integrated traditional massage into the overall health-care system. As for the **"drive" for creating health-care facilities**, a learning centre might be set up with either external or internal forces. Some centres were established and managed by organizations outside the community, while some were set up by knowledgeable healers who were also responsible for the setting up and operations. Concerning "**knowledge transfer**", some centres provided health-care services based solely on indigenous knowledge, some had got them integrated with the knowledge gained from formal training or folk healers from another community. Some were operated by the healers who had been formally trained by a state agency. As for "**location**", some centres were located in the compound of the head healers' houses, while some were located in a public space, or as part of a social institute, with different strengths and weaknesses.

3. Key factors for the success/failure of the learning canters, including local context, economic viability and network building. (1) **Local context**: the learning centres' establishment and existence truly reflected the community's needs as well as folk healers' readiness and capacity, in addition to other relevant factors. (2) **Economic viability**: the healers at the centres had enough income to support themselves. Some were paid for working at the centres fulltime while the others had other sources of income. They were not under the pressure to generate high

income, so asking them to take on the work of maintaining a learning centre was possible. (3) **Network building**: learning centres required networking to increase its proficiency. Community members had to realize that the centres work for public interests and took part in the decisions related to the centre's operations. Committees were set up for the management of the centres. On the other hand, the centres were linked to groups or organizations outside the community. This was to empower the local healers as well as increase their social status.



In summary, indigenous medicine learning centres varied in their operations, objectives, and management. All of them had potentials for success with the right conditions in their own context, so an in-depth analysis into each centre would yield clear information that could be used to make it successful and sustainable.

4.2.4 Certification of folk healers' rights: support and development models for integration of indigenous medicine into community health system

Folk healers play an important role in providing physical, mental and spiritual care to people in their communities, especially rural and tribal ones. The Bureau of Thai Indigenous Medicine recognizes their role and is determined to support those who have dedicated their lives and work to caring for the patients. They are well respected by community members and they themselves are always grateful to their masters. Under the 1999 TTM Knowledge Protection Act, DTAM's Central Registrar's Office, in cooperation with provincial public health offices and state health-care facilities, between 2002 and 2010, managed to register 53,143 folk healers in 76 provinces. The healers are classified into six groups, namely herbalists, massage therapists, traditional birth attendants (TBAs), bone healers, ritual healers, and others. The regions with high to low proportions of healers are the Northeast,

the North, the South and the Central Plains. And among them, as many as 16,000 folk healers have had more than 20 years of experience in community health care.

There are two types of folk healers' rights certification by DTAM: (1) certification of their legal and professional rights and (2) certification of their rights by the community.

Type 1: Certification of legal and professional rights

Article 33(1) of the 1999 Healing Arts Practices Act states that a person requesting registration and licensing to practice Thai traditional medicine must be registered with a government agency and pass the licensing assessment of the TTM Profession Committee's requirements. The law provides the opportunity for the honouring and certification of folk healers who have been looking after the mental and physical health of people in the community for a long period of time. The legal status allows the practitioners to perform their treatment with dignity. It also protects them from being exploited by people with no understanding of indigenous health care.

(1) Administrative mechanism

The TTM Profession Committee is responsible for assessing the capacity of folk healers for registration and getting a licence as TTM practitioners. And the Committee has set up the Subcommittee on Thai Indigenous Medicine comprising licensed TTM practitioners and experts. The Subcommittee's duties are to (1) determine standards and criteria, licensing conditions; and give assessment to persons who seek status of licensed practitioners in the field of Thai traditional medicine, (2) offer a licensing examination and assessment of TTM practice applicants as per Section 33(1)(c), and (3) prepare a conceptual framework and guidelines for the development of indigenous medicine and the compilation of knowledge on Thai indigenous medical knowledge from licensed TTM practitioners under Section 33(1)(c).

(2) Working procedures

The 1999 Healing Arts Practices Act sets out five steps in the assessment and licensing of indigenous healers under Section 33(1)(c):

1. Specification of criteria and evaluation methods for persons seeking the status of licensed TTM practitioners.

2. Compilation of indigenous medical knowledge.

3. Nomination of persons with experience in indigenous medicine and issuance of certification letters by a government agency.

4. Assessment of knowledge and ethics of persons with experience in indigenous medicine by the TTM Profession Committee.

5. Registration and licensing of TTM practitioners.

(3) Health benefits for the people

According to a preliminary survey of folk healer's opinions, they appreciate the legal recognition by the government. They feel proud and honored. The licensed folk healers vow to continue using their skills and knowledge for the benefit of mankind and patients' medical care. They also intend to clean and tidy up their homes, keep records of their treatments, follow up on their patients, and continue to search for new and more effective herbal remedies.

Type 2: Certification of rights by the community

Under the National Government Organization Act B.E. 2534 (1991), Section 32, and the MoPH's Ministerial Regulation on the Organization of the Department of Thai Traditional and Alternative Medicine, Clause 2(1), DTAM's Director-General has issued two regulations: (a) Regulation regarding the issuance of certification letters for indigenous healers of 2011 and (b) Regulations regarding the issuance of certification letters for indigenous healers No. 2 of 2012. This is to facilitate the issuance of a "certification letter for indigenous healer" for well-respected indigenous healers by the DTAM or the Provincial Public Health Office. This model of certification is in line with the nature of indigenous medicine with community participation and decentralization principles. Besides acknowledging folk healers' rights by the community will result in a database for the acknowledgement of those with legal and professional rights.

(1) Responsible units and administrative mechanism

Both sets of regulations are under the responsibility of DTAM, while the administrative mechanisms involve both local and provincial agencies. At the local level, the folk healers need to be certified by their community (at least 10 community members), the local government organization, and the primary care unit. At the provincial level, the healers who meet all the criteria and have been certified by

the local agency are entitled to receive a "certification letter" from the Provincial Chief Medical Officer or DTAM's Director-General.

DTAM's Bureau of Thai Indigenous Medicine has set the criteria for screening folk healers according to the two DTAM's regulations on folk healers' certification. A folk healer eligible for certification must have the following qualifications:

1. At least 10 years of regular and continuous practice, based on his/her expertise (and the frequency of illness occurrence in the locality)
2. Working with knowledge learnt from ancestors, or acquired within the locality
3. Ability to treat illnesses
4. Readiness to pass on knowledge
5. Experience in knowledge transfer
6. Reasonable medical fees
7. Recognition by community members
8. High morality

(2) Procedures – four steps in applying for a certification letter:

1. Application (submitting all necessary documents)
2. Coordination to get certification from the local agency
3. Approval and issuance of certification letter by DTAM or Provincial Public Health Office
4. Registration and record-keeping of certification documents

Certified folk healers can provide medical treatments or services according to the indigenous medical wisdom as usual or the specified scope of practice.

(3) Achievements

Between 2004 and 2012, folk healers were certified for their professional indigenous medical practice in two phases: Phase 1, during 2004–2009, 44 folk healers were certified as per the 1999 Health Arts Practices Act, and Phase 2, during 2010–2012, the certification of folk healers under the local wisdom promotion policy. In this phase, the MoPH, in collaboration with the Bureau of Sanatorium and Art of Healing of the Department of Health Service Support, the TTM Profession Committee, and members of state health-care facilities in 76 provinces, launched the "Study and Capacity Building of Folk Healers for Registration and Certification

under the 1999 Healing Arts Practices Act Project", under which 121 folk healers were registered and certified.

Concerning the certification of folk healers through community participation, 2,075 of them in 30 provinces were certified. The project is useful in identifying folk healers with potentials for certification. Patients receive reliable care from folk healers who have been certified by community members. Moreover, the certification scheme led to more cooperation and knowledge sharing between folk healers and state health-care providers. Such efforts are, for example, a pilot project for TTM practitioners at *tambon* (subdistrict) health promoting hospitals (THPHs) to learn from folk healers, and a joint project on indigenous medical knowledge management with higher education institutions. In these efforts, some folk healers were also invited as resource persons to give a talk on postpartum care in training sessions for village health volunteers.

Conclusion

For Type 1 recognition of folk healers' legal and professional rights, currently there are 165 certified indigenous healers, of whom 121 (73%) were certified during 2010–2012, in addition to 44 (27%) certified during 2004–2009 under the pilot project.

For Type 2 recognition of folk healers' rights by the community, the community certification scheme took place in all the provinces through decentralization mechanisms and participatory procedures that aimed at promoting community self-care. Currently, there are 2,427 certified folk healers under the scheme (August 2016).

Both certification models support the mission to promote the utilization of indigenous medicine for community health care. They facilitate the primary health care referral system. The Bureau of Thai Indigenous Medicine has continued its support for rights certification in terms of technical assistance by confirming folk healers' knowledge and experience and empowering folk healers' roles. The Bureau has also prepared a draft notification of the MoPH regarding the licensing and exemption for indigenous medical practice, in line with the TTM Professions Act B.E. 2556 (2013), so that folk healers can safely use indigenous medical wisdom in providing health care for the people.

4.2.5 Local health funds under the UCS: cost and potential of setting up community health funds, based on indigenous medical wisdom

The World Health Organization (WHO) has set out the WHO Traditional Medicine Strategy (2014–2023) as guidelines for its Member States. Three main strategic objectives are: 1) to build the knowledge base, 2) to strengthen quality assurance and safety, and 3) to promote universal health coverage by integrating TTM services into health-care service delivery and self-healthcare.

Thailand has made a steady progress in following these strategies, especially the one under the universal health coverage scheme (UCS). Thailand has expanded its health benefits to cover Thai traditional and alternative medicine services. Since 2007, the National Health Security Office (NHSO) has operated the TTM System Development Fund to provide additional or on-top funding to cover TTM service fees at 0.50 baht per capita in 2007 (totalling 28.2 million baht), which has risen to 10.77 baht per capita (totalling 525 million baht) in 2016.

Moreover, Local Health Security Funds were established in 2006 (at subdistrict or municipal level). It is a major innovation in Thailand's health system that promotes multisectoral cooperation involving participation by several sectors with the local government organizations as a key mechanism to facilitate the work among several community groups.

Besides fostering participation from the local government organizations in health care provision, Local Health Security Funds encourage people to be self-reliant in terms of health and give health-care personnel an active role in community health care in the local context.

Local Health Security Funds provide health security to local people by encouraging participation at their own terms. Regulations are set out to help the local government organizations (LGOs, including *tambon*/subdistrict administrative organizations, or TAOs, and municipalities) to operate and manage the fund effectively for disease prevention, rehabilitation, and primary care provision. Common targets have been set by the NHSO, the MoPH, the Ministry of Social Development and Human Security, the Ministry of Interior, the Provincial Administration Organizations Council of Thailand, the National Municipal League of Thailand, and the Subdistrict

Administration Organizations Association of Thailand. So they all work together with the focus on emergency medicine, health promotion, disease prevention, and rehabilitation. They also promote social welfare and access to health services for the mothers and children, the elderly, the disabled, the disadvantaged, those with occupational risks, and patients with chronic diseases.

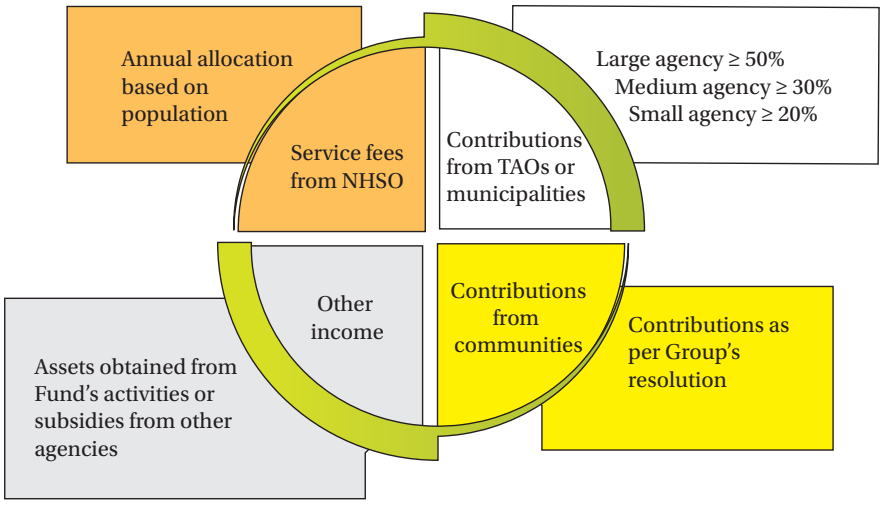
The Local Health Security Fund's operation and management principles to be followed by local government organizations are as follows:

1. The Fund has higher management capacity.

2. The Fund can be used for the stated objectives, especially the management of care for the elderly and the disabled, and the upgrading of child care centres in a concrete and efficient manner.

3. There will be more cooperation and participation in the community and with network member organizations in the locality for better health care under each Fund.

Diagram 4.1 Sources of revenue of local health security funds



Source: Guidelines for the administration of local health security funds (TAO or municipality funds)

Each year, the number of Local Health Security Funds of local government organizations (TAOs and municipalities) has been rising steadily, depending on their readiness and suitability. Out of the 7,776 TAOs/municipalities, as many as 7,760 have set up the local funds – a coverage rate of 99.79%; only 6 have not set up their local health funds.

Activities eligible for financial support by the Fund:

Category 1: **Activities that promote and support the provision of public health services of the local health-care facility or unit.** The focus is on health promotion, disease prevention, rehabilitation and proactive primary care, which are essential for health and livelihood. The aims are to make better quality services accessible to mothers, children, elderly people, disabled people, disadvantaged people, those with occupational risks, and patients with chronic diseases in a more thorough and efficient manner.

Category 2: Activities that facilitate civil groups or local organizations in their work to monitor health promotion activities or disease prevention for members or people in the area. The Fund also supports the purchase of equipment or furniture with the value under 5,000 baht per project; and the procured equipment or furniture is under the care of the group or organization granted the fund.

Category 3: Activities that promote and support healthy lifestyles, disease prevention, rehabilitation, and proactive primary care by child care centres, rehabilitation centres for the elderly or the disabled in the community as per NHSO's criteria. This type of activity will be granted not less than 15% of the fund's income in that fiscal year.

Category 4: Activities to help with the expense in administrating or improving the efficiency of the Local Health Security Fund. Funding for this category should not exceed 15% of the income received in that fiscal year. The purchase of equipment or furniture essential for the project activities with the value not exceeding 20,000 baht a piece is allowable, using the LGO's procurement regulations. The procured equipment or furniture is under the care of the local office granted the fund.

Category 5: Activities in times of epidemic or disasters. The Fund committee can approve the payment to support activities to prevent or solve public health problems as needed in a timely manner.

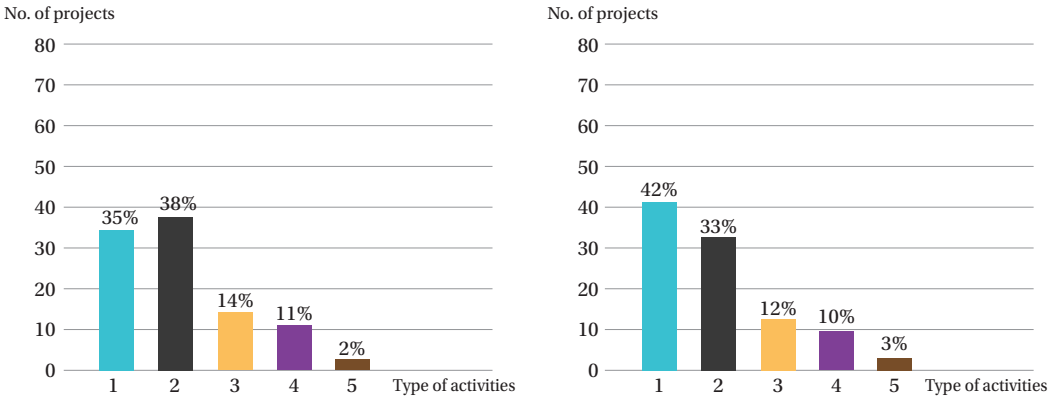
Impact from the change

There has been a change in health care by government agencies at the community level. Before the establishment of NHSO's Local Health Security Fund, local health-care agencies or THPHs, working on health promotion, disease prevention, curative care and rehabilitation projects, had to submit a proposal to a relevant central administration agency or a community hospital in order to apply for a working budget. Some of these projects were turned down because they did not seem to be dealing with pressing issues in the eyes of the District Health Cooperation Committee (DHCC), since a particular problem only mattered in a particular community. That was one weakness of the past grant application system, in which the community did not have any opportunity to participate in the solution of its own health problems.

The recommendations from the seminar on "Directions of TAO/Musicality Fund in the Next Decade" together with suggestions from public hearings held between 2012 and 2013 resulted in the establishment of the Guidelines for Operations and Management of Local Health Security Fund for Local Government Organizations B.E. 2557 (2014). And a notification on this matter was issued by the Subcommittee on Health Promotion and Disease Prevention under the Health Security Office Committee.

Since the notification's effective date of 1 October 2013, all participating local health security funds have followed the new guidelines, which are different from the previous notification in many aspects. In the notification, five categories of activities can be financed as mentioned above, but none is related to the use of traditional or indigenous wisdom for health care. As a result, the funds had no indigenous health-care projects in their quarter 2/2015 budget plan, see Diagram 4.2.

Diagram 4.2 Number of projects and budget by type of activities (of local health security funds)



Type of activities	No. of projects	Budget (million baht)
1 = Support for service units/facilities/health units	14,055	611.76
2 = Support for civil groups or others	15,375	481.56
3 = Support for centres for care of children, the elderly, or the disabled	5,566	179.76
4 = Support for Fund management or development	4,295	149.30
5 = Support in times of epidemic or disasters	892	37.19
Total	**40,183**	**1,459.57**

This was not the case with the previous 2010 guidelines, which covered only four types of activities, of which Type 3 supported to local health activities by the people or local community, involving health promotion, disease prevention, rehabilitation, and indigenous wisdom promotion, initiated by the people and local community organizations.

A review of the Promotion of Local Wisdom on Health under the Statute on National Health System of 2009 found that the number of Thai traditional, indigenous and alternative medicine (TTM/IM/AM) projects undertaken by Local Health Security Funds steadily increased at least 1.5-fold each year between 2007 and 2011. Out of the 7,424 funds, 679 (9.38%) covered TTM services or activities.

This is unfortunate since indigenous health wisdom exists in every community. Local people have been using *fa-thalai-jon* or kariyat (*Andrographis paniculata* (Burm.f.) Nees) to cure sore throat and rashes; betel leaves and alcohol to cure skin irritation; *ka-prao* or holy basil, ginger, or lemon grass to treat bloating; *sa-led-pangpon* or barleria (*Barleria lupulina* Lindl.) and alcohol to treat insect bites,

etc. These are home remedies that would strengthen and sustain the community's health-care system. If there is no attempt to preserve them, they might disappear, leaving local people to rely only on government-provided health services. This could be the start of the fall of community's strength in self-reliance health care. People will no longer try to rely on self-care as normally practised before.

Recommendations for further development

There should be one more category dedicated to the promotion of local or indigenous wisdom. This will make community members as well as the committee responsible for local health funds have confidence when submitting and approving the projects. This will also empower the local health system and encourage community participation in taking care of their own health, according to the objective of the NHSO's notification.

4.2.6 Networks of folk healers: the power behind folk medicine in communities

Folk or indigenous medicine is culture-based practices with its root derived from local wisdom. It is a way of thinking, not a technical knowledge, and involves situational knowledge with constant learning and integration with various disciplines.

The network is a relationship system embedded in the human's way of life. It is the relationship of learning processes which foster expansion of thoughts, working processes, and idea exchanges. This leads to the construction of new knowledge, resulting in "new production process" or "cultural reproduction". Many types of networks have their roles in overseeing the relationship among people in the community. Examples include the barter trade network and the cattle caravan in the Northeast, and the networks of temples that take part in small irrigation ditch/check-dam building in the North.

Some networks are more than just a group of people with the same goal; they can make impacts on policies and give directions to social development. They are strong enough to negotiate for social changes. They can also fuel development and handle the power relationship with the outside world. There are several examples: the Community Forest Network which has successfully campaigned for the Community

Forestry Act; the Northern Folk Healers Network which has effectively monitored HIV infections; the Assembly of the Poor; and the Thai Farmers' Debt Network.

There are two types of folk healers' networks:

Type 1: Networks where folk healers come together for mutual benefits. For example, a group of folk healers or spirit-mediums meet yearly to pay respect to their masters. In the Northeast, there is a network of *lam-song*, a net work of senior and junior *khru-ba*, and a network of *khru-ba* and *lukphueng-khru-thian* that hold a master-respecting ceremony and helping-each-other event, and groups of folk healers and herb gatherers getting together to collect herbs and prepare herbal remedies for sale.

Type 2: **Networks where the healers come together to share knowledge about forest herbs and treatments.** Examples include a network of folk healers which campaigned for the National Health Act, the *Lanna* (Northern) Folk Healers Network, the Council of Northeastern Folk Healers, and many folk healers clubs in other areas.

The Second National Strategic Plan for Thai Wisdom and Thai Healthy Lifestyle Development, 2012–2016, acknowledges the importance of these networks by stating as Strategy 2, "the development of the health system of folk medicine, Thai traditional medicine and alternative medicine together with the empowerment of the civil health system. The DTAM has facilitated the establishment of learning centres for folk healers in all provinces. The department has also supported many indigenous medical knowledge management activities of such centres and folk healers' networks, for example, bone-fracture treatment, cancer treatment, snakebite remedy, paresis/paralysis remedy, maternal and child health care, and elderly care.

The Second National Strategic Plan for Thai Wisdom and Thai Healthy Lifestyle Development, 2012–2016, has set out strategies to develop and empower communities to manage their health system as follows: (a) **Encouraging participation by local government organizations, folk healer networks, and civil groups** so that communities can take care of their own members using local health wisdom already available to them. This requires the allocation of budget by the community and relevant agencies as well as the certification and promotion folk healers' status. (b) **Empowering and fostering participation from the local community** to

restore, transfer, and utilize the local health wisdom, in line with ever-changing socio-economic and cultural contexts. (c) **Supporting and empowering local folk healers' networks** by certifying and promoting their status. This also includes empowering folk healers in the community; encouraging succession of knowledge by helping younger generation to appreciate the lives and work of folk healers; preserving traditional learning styles; developing a knowledge management system on remedies and healers; improving technical development, services, and management; establishing a forum where folk healers can meet and share their knowledge and experiences; and supporting the connection of folk healers' networks at the community, regional, and national levels with a participatory process.



Over the last decade, DTAM's Bureau of Thai Indigenous Medicine has been working continuously with folk healers' networks as the folk healers possess tacit knowledge. They also relate to the community traditionally and culturally. The folk knowledge is practical, ritual, and religion-based; and it is also related to particular forests and ecosystem. The working process is focused on the empowerment and understanding of differences in social, cultural, and ecological contexts. The Bureau employs a participatory approach along with knowledge management by collecting/revising local medical knowledge and revising relevant policies and laws. This is to foster the succession of knowledge and learning process, to restore and support community health care, resulting in a proper and timely integration of folk medicine into the government's health-care system.

Major folk healers' networks:

1) Folk healers' networks coordinated by Bureau of Thai Indigenous Medicine

In 2014, there were 54,274 folk healers registered with DTAM's Central Registrar's Office. A survey by the Bureau of Thai Indigenous Medicine in the same year found that there were approximately 430 active groups, clubs or networks of

folk healers across the country at the subdistrict, district, or provincial levels. Some of them get together at learning centres, usually residences of the folk healers. They provide traditional health care, i.e. massage, herbal steam bath, herbal compress, as well as diagnosis and herbal medications. They also educate the community on local health-care wisdom. They gather herbal remedies and recipes, create a database of folk healers, translate ancient manuscripts, and produce indigenous health products such as herbal compress balls and dried herbs to raise funds. They also organize knowledge-sharing forums for members of their own network and others.

2) Regional folk healers' networks

- Folk healers' networks in the Northeast. Communities' ways of life have evolved with social and economic changes. The idea of community development work in the form of "networks" has been revived in community development. The work on folk medicine in the Northeast was founded and linked to the development process under the government's effort to promote primary health care. The development effort was reviewed and shifted towards community approach by non-governmental organizations (NGOs). The project to support herb usage for a self-reliant lifestyle has opened up a workspace at the community level. Community hospitals have expanded their work into villages. Groups consisting of folk healers and people who were interested in folk medicine were formed with the support of the Office of the Primary Health Care Committee. The emphasis was on the empowerment of these community-based groups. However, knowledge development on herbal treatments was carried out separately by each of these groups. In some areas they joined at the provincial level. Some of them joined a network working on forest resources management. This later became "Northeastern Folk Healers Assembly" where the healers meet to share knowledge, experiences, and thoughts. They also conduct strong campaigns for the rights of folk healers.

One of the active folk healers' networks in the Northeast is the Ban Dung Folk Healers Network in Udon Thani province. Its 115 members are classified into four groups: (1) herbal specialists with 88 herbal recipes, (2) blowing healers with 46 blowing therapy manuscripts, (3) three masseurs/masseuses, and (4) nine traditional birth attendants. They can treat 50 symptoms with 150 treatment methods. The network has made a commitment to pay the folk healers for recording patients'



illnesses and treatments they have provided. The group also coordinated with subdistrict or *tambon* administrative organizations (TAOs) and *tambon*/subdistrict health promoting hospitals, and submitted folk healers' treatment records to both local agencies. The network applies for grants from the TAO in their locality to support their activities. Young people in the area also have an opportunity to conserve the indigenous medical practices. They hold mobile talks on this matter and conduct surveys of indigenous medical resources in the locality (mankind, folk healers; textbook, palm leaf manuscripts; forest, medicinal plants).

- **Folk healers' networks in the North.** The School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University, is one of the pioneers in the subject. The school has been doing research on Thai traditional medicine, folk medicine, and alternative medicine for 30 years. Between 1984 and 1988, studies of local wisdom and food-related beliefs on health of the Thai people in the upper North were conducted. The study was part of the project on "Asian food habits in six ASEAN countries". Later it conducted research on the potential of local wisdom for health care of minority groups in the upper North between 1991 and 1996, with co-funding support from the Department of Cultural Promotion and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The project

particularity focused on the health-care culture and potential of *Lanna* (northern) folk healers (*moh mueang*). The school also helped solve the AIDS crisis, using folk wisdom, with the support form the Health Systems Research Institute (HSRI) and UNAIDS between 1996 and 1999.

In 1999, the Centre for Research and Development of Folk Medicine was established with the support of the Thailand Research Fund. The center revised the body of knowledge about *Lanna* indigenous medicine together with the networks of folk healers in eight provinces in the upper North. The result is a set of research projects from 2000 to 2004 on *Lanna* folk healers in the upper North to synthesize their knowledge and produce a *Lanna* reference medical textbook. Later between 2005 and 2009, the Centre used the results of the research for building the capacity of *Lanna* folk healers in the eight provinces. It also conducted research and development projects on indigenous medicine and herbs used by minority groups in the upper North.

This later developed into a Network of Indigenous Medicine and Herbs in the Mekong Basin in collaboration with Tai Sipsong Panna and Tai Juang hospitals in southern China, Waen Bo Kaew and Luang Nam Tha Hospitals in Laos, and the network of Thai folk healers in Shan State of Myanmar. With funding from the Thailand Research Fund in 2008 and 2009, the network organized the first and second seminars in Chiang Rai for members of the Network of Indigenous Medicine in the Mekong Basin from four countries. In 2010 and 2011, the Chinese government, through the Yunnan and Gwangxi Tribal Medicine Association, hosted the third and fourth seminars in Jin Hong and Kun Ming, respectively. Vietnam and Cambodia later joined the Network in 2011; so the Network was established by the School and now has six member countries in the entire Greater Mekong Subregion (GMS).

One active network in the North is the Chiang Rai Council of Indigenous Healers (*Sapha Moh Mueang*). Registered as a non-profit organization in 2005, the Council is dedicated to the development of *Lanna* folk medicine and has members or networks in 18 districts with the coordination office in Chiang Rai's Mueang district. The Council's geographical area is divided into four regions (each covering 4–5 districts), holding a forum in each of the regions at a time for folk healers, health officers, village health volunteers, women's group members, as well as officials from

local government organizations. They meet and make recommendations on how to empower folk healers by setting up a working and participating network such as developing a curriculum for formal education or transfer of knowledge to young people, transforming the homes of healers into knowledge centres, upgrading the facilities to meet hygiene and safety standards, promoting herb growing at healers' homes (creating a forest at healer's house), and growing herbs in local forests for conservation purposes. *Tambon*/subdistrict health promoting hospitals and local government organizations should help with the mentoring and counselling to these groups through activities, in addition to holding four regional forums, such as making home visits, providing mobile folk medical services, and holding *khuang pha-ya* or wisdom arena. In addition, the network is preparing to organize a *khuang pha-ya* at the provincial level.

Conclusion

The networks of indigenous healers can be a major force in the development of local wisdom with the clear concepts and directions in the study, collection, management of knowledge, utilization of health wisdom, continuous practical support, and sufficient, continuous financial assistance from relevant agencies.

4.3 Knowledge management and research: lessons from indigenous healers' practical knowledge

4.3.1 Indigenous herbs and local food: security of community health system

Thailand is a land of biodiversity with various herbs growing naturally in forests, rice fields, and streams, depending on geographical and seasonal variations. People in the community collect them for cooking or medicine preparation according to local culture, resulting in indigenous knowledge of food and medicine. However, the Thai people today do not pay much attention to these local food recipes or indigenous remedies, which can guarantee local health system security. Industrial agriculture has also made the herbs dangerous for consumption while western culture consumption has marginalized the importance of local food and herbs. This

is the reason behind the study on benefits of herbs and local food. The objective is to motivate the joint effort for the revival of herbal use for the security of the community health system.

Indigenous herbs include local vegetables used for preparing remedies for illnesses. They have been consumed both as food and as medicine for a long time. Such wisdom results from the accumulation of knowledge, trial-and-error practices, and continuous knowledge transfers from generation to generation.

1) Benefits of indigenous herbs/vegetables

Thailand has a variety of ecosystems from the North to the South of the country. There are tropical rainforests, mixed deciduous forests, hill evergreen forests, mangrove forests, and plains. Surveys have found that there are approximately 250–900 indigenous herbs or vegetables. The knowledge of their benefits has become part of Thai food wisdom and culture. The benefits of indigenous herbs/vegetables can be viewed in four perspectives:

1.1 Local wisdom. The local herbs and vegetables have been used in home cooking for a long time. The experiential knowledge is tied to the lifestyle of the people in each community and turned into food recipes with health benefits. The herbs/vegetables can be both local food and medicine.

1.2 Health benefits. These indigenous herbs/vegetables not only contain necessary nutrients, but also have antioxidants that can reduce the risks of chronic illnesses such as dyslipidemia, high blood pressure, and diabetes. Consuming them can generally boost the immune system and reduce the chance of getting such illnesses. The following herbs/vegetables are found to have high levels of antioxidants: wild bitter gourd (*Momordica charantia* L.), wild betel or *cha-phlu* (*Piper sarmentosum* Roxb.), *chiangda* (*Gymnema inodorum* (Lour.) Decne.), ivy gourd or *tamlueng* (*Coccinia grandis* (L.) Voigt), tummy-wood or *kra-don* (*Careya arborea* Roxb.), great morinda or *yor-ban* (*Morinda citrifolia* L.), neem or *sa-dao* (*Azadirachta indica* A.Juss.), *cha-luead* (*Caesalpinia mimosoides* Lam.), and pea eggplant (*Solanum torvum* Sw.).

1.3 Food security and ecosystem. Food security means having enough food for human consumption and having a variety of food to choose from. The food must be clean and safe, contains nutritional values and its sources must be

accessible to everyone. At present each community can find or grow more than 100 kinds of indigenous vegetables, indicating food/vegetable security, relying on natural sources. These vegetables also maintain the balance of the food chain and the ecosystem.

1.4 Economic benefits. There are more than 250 types of local vegetables, of which 50 can grow all year round. Examples of such vegetables are Indian mulberry (*yor-ban*), morning glory, ivy gourd (*tamlueng*), agasta or *khae* (*Sesbania grandiflora* (L.) Pers.), and drumstick or *ma-room* (*Moringa oleifera* Lam.). These are commonly grown and sold at local markets. The types and amounts of local vegetables available vary according to the local preferences, food culture, ecosystem, and seasons.

In 2007, the Bureau of Thai Indigenous Medicine launched a project to empower local communities in the protection of indigenous knowledge in six provinces (Surin, Kalasin, Chanthaburi, Nakhon Sawan, Trang, and Phattalung). The objective is to empower community members on knowledge/wisdom management for the restoration of forests and local herb growing areas, and to find a way for sustainable use of herbs through community efforts. The process is separated into two parts:

1) Knowledge management by experts. The project has acquired four sets of fundamental knowledge, including:

"Wisdom of indigenous healers: thinking system and usage of local herbs in relation to forests and local herb sources". When the villagers are ill, they seek help from the folk healers who make differential diagnosis and prepare herbal remedies for them. The healers have learned their craft from their older relatives or masters when they were young and they have been practicing and accumulating knowledge as well as experiences for many years. They use three forms of herbs: fresh, dry, or readily prepared as instant medicine. They acquire the herbs mostly from natural forests, their own herb garden or farmland, and traditional drugstores. However, the storage, use, and sale of these herbs are not well designed or organized. This increases the risk of extinction for many types of herbs.

"Value of indigenous herbs to the development of herb production system and community economy". There has not been much research on the utilization of "forest products" both at the national and international levels despite

their common use in traditional drug industry and indigenous medicine, and for Thai traditional and indigenous healers. These herbs are marketed through herb wholesalers in Bangkok and Thai traditional drugstores in other provinces. The collection of herbs from natural forests, however, has not been done sustainably. No method of conservation is applied and some herbs have already become extinct. Herb imports from neighboring countries can only partially solve the problem. What is urgently required is the involvement of the government or community in the collection, conservation and utilization of forest-based herbs. Another problem is a shortage of herb collectors; with the lower sales value of the herbs, many have turned to other professions.

"**Globalization and biodiversity".** Under the context of globalization, there is the exploitation of community resources and wisdom as well as an opportunity to learn and share with other communities in the world. That can be achieved through the cooperation in following international rules, which will help conserve, develop and sustainably use natural herbs, as well as reduce the impacts on the communities.

"**Lessons and experience of civil society in resource management".** Many communities throughout Thailand are holding a lot of knowledge in the use and conservation of forests. They can rely on food and medicinal plants in the forest and water sources. Plant biodiversity can be maintained in the areas where there are forest resources, water, and farmland, using a mixed agricultural practice to grow food for families and the markets. It can be achieved if the community can benefit directly from the forest, generate income, and reduce expenses. There are several important factors that make the community strong and able to manage the community forest as well as the diversity of food plants and herbs. They include the sense of community, strong community leaders, multi-age grouping and cooperation, and jointly set rules/regulations.



2) Field operations in six areas. The operations have located 114 folk healers/scholars and 737 types of food plants. This is the local wisdom that is connected to community health and local resources. Local scholars and healers adopt the role of health-care providers and managers of local resources to ensure sufficient and sustainable use for the well-being of the community.

The lessons learned from the field operations have developed into a project on knowledge management and development of conservation model and the support of indigenous wisdom on vegetable consumption under the sufficiency economy principles. The project has three objectives: (1) manage indigenous knowledge on health and economic benefits of local herbs and food; (2) study and develop initiatives to support their cultivation and consumption; and (3) manage indigenous knowledge and encourage the conservation of local vegetables. The project's target groups include government and private sector personnel interested in local herbs and food. It also aims to work with community-based groups such as housewives, local scholars, folk healers, youths, local government organizations, indigenous vegetable farmers and sellers, and community experts on local vegetables. The operating procedures can be classified into two major parts.

Part 1: The study of "indigenous knowledge about local herbs and food in terms of health benefits and local economy" by experts.

(1) Conducting literature review of current situations and updates on the use of local herbs and food recipes in the context of community health and economy.

(2) Undertaking field studies in four regions to gain insight into how the utilization of herbs is done health wise and economy wise, including what can be added to make it more extensive and sustainable.

(3) Preparing sets of knowledge about tools and methods to encourage the use of indigenous vegetables and food in the context of community health and economy.

(4) Organizing technical seminars where experts working on local vegetables and food can meet and share their ideas and experiences.

(5) Preparing a manuscript on "Knowledge of indigenous vegetables and food in the context of community health and economy.

Reviewing relevant literature and **preparing a database on 250 indigenous vegetables** by a team from the Bureau of Thai Indigenous Medicine.

Part 2: The study and development of models for promoting the cultivation and consumption of indigenous vegetables in the community. This is a participatory research project conducted in the following 15 areas:



1. Chiang Khian and Ngao subdistricts, Thoeng district, Chiang Rai province
2. Nam Kaen subdistrict, Phu Phiang district, Nan province
3. Phrabat Wang Tuang subdistrict, Mae Phrik district, Lampang
4. Mae Yuam subdistrict, Mae Sariang district, Mae Hong Son province
5. Nong Phue subdistrict, Tha Li district, Loei province
6. Na Sameng subdistrict, Don Tan district, Mukdahan province
7. Kut Nam Sai subdistrict, Nam Phong district, Khon Kaen province
8. Takhian subdistrict, Kap Choeng district, Surin province
9. Na Di district, Prachin Buri province
10. Chak Thai subdistrict, Khao Kitchakut district, Chanthaburi province
11. Dan Makham Tia subdistrict, Dan Makham Tia district, Kanchanaburi province
12. Pak Song subdistrict, Phato district, Chumphon province
13. Wang Ang subdistrict, Cha-uat district, Nakhon Si Thammarat province
14. Kamphaeng subdistrict, La-ngu district, Satun province
15. Khlong Hin subdistrict, Ao Luek district, Krabi province

The results of the study yield a set of knowledge on "indigenous vegetables and food in the context of community health and economy", a database of the vegetables which allows convenient search and access for the public, a model for promoting the cultivation and consumption of local vegetables in 15 areas in the country, and an academic/operational network on local vegetables and food.

Conclusion

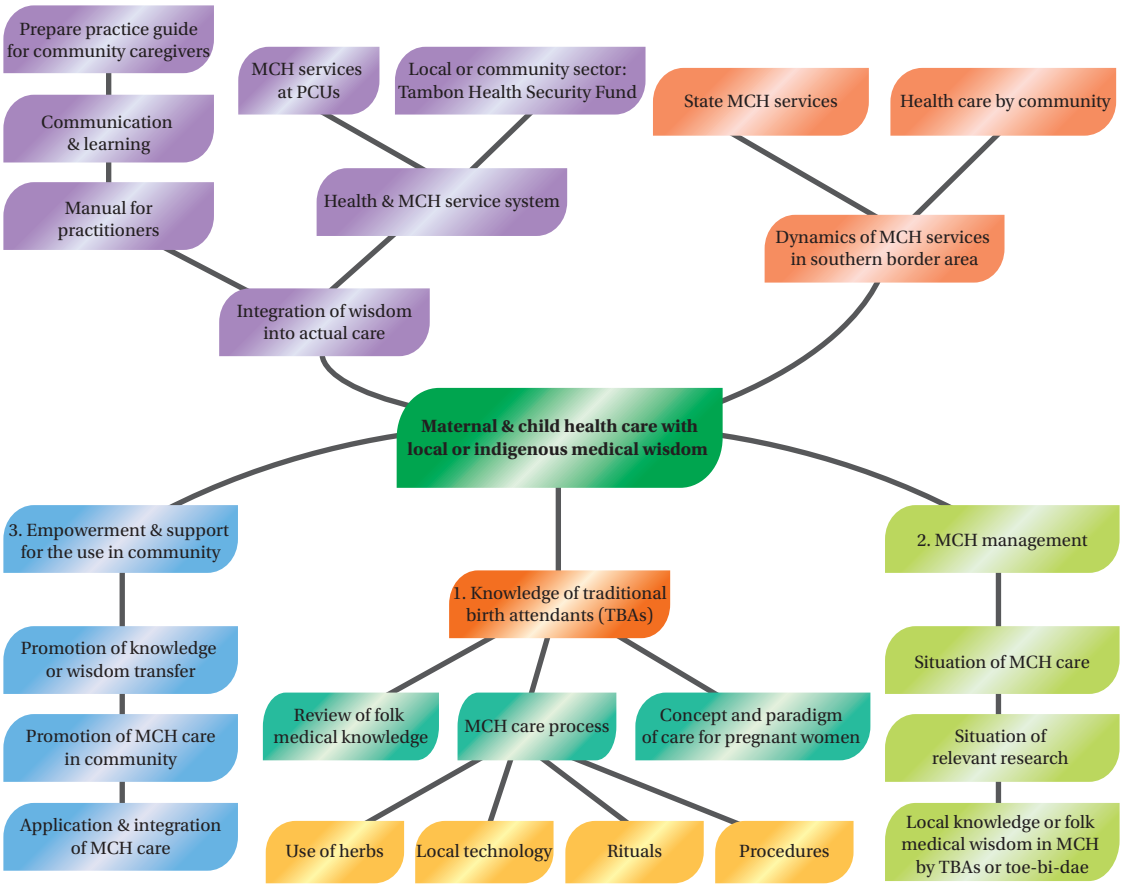


The findings from the two projects [(1) capacity building of communities for Thai traditional wisdom protection and (2) knowledge management and model development for promoting the consumption of local vegetables and food] suggest that community health security is a result of the maximized use of wisdom of local herbs and food by indigenous healers or local scholars for the community in terms of consumption for health promotion, and disease prevention. Relevant government agencies, however, still need to work with the community to ensure sustainable conservation of the existing resources for future generations.

4.3.2 Indigenous medical knowledge of maternal and child health care: integration of maternal and child care in primary care system

In rural communities, it has been found that traditional birth attendants (TBAs) play a key role in maternal and child health (MCH) care during pregnancy, delivery and postnatal stages. The care procedures include: (1) physical health care, (2) herbal treatment, (3) advice and assistance for new mothers, and (4) ritual performances. They are part of the people's way of life in the context of local culture, religions, and ecosystem. At present, there are 57,665 folk healers (May 2016) registered with DTAM's Central Registrar's Office, 16,000 of whom have had more than 20 years of experience in community health care, and 9,000 are licensed TBAs possessing 145 herbal remedies for maternal and child care.

Diagram 4.3 Concepts of maternal and child health care with local or indigenous medical wisdom



The study:

The study involved three aspects: survey/compilation of knowledge, knowledge synthesis, and operation/assessment.

1. Survey and compilation of knowledge

1.1 Management of folk medical knowledge for MCH care by:

- Reviewing the situation and movement regarding the use of indigenous medical wisdom for MCH care, focusing on (1) indigenous wisdom for MCH care, (2) knowledge derived from MCH research, and (3) knowledge from community's experience such as folk healers and local scholars.

- Conducting field studies in four regions to synthesize the lessons learned and to identify the model for the utilization of local medical wisdom for MCH care as well as the application in the community and health-care facilities.

- Preparing sets of knowledge or guidelines and operational tools to support the use of local medical wisdom for MCH care.

1.2 Regional operations to encourage the use of local wisdom for MCH care. The activities include: survey and registration of folk healers, local scholars, herbal drug recipes and indigenous herbs for MCH care, local nutritious food recipes for mothers and children; school visits to educate students on home-based MCH care; and preparation of directory of folk healers or local gurus/scholars and a database of herbal remedies for MCH.

2. Knowledge synthesis

Synthesizing indigenous knowledge resulted in the preparation of guidelines, best practices, sustainable utilization of indigenous wisdom, and operational tools for MCH care. Lessons learned were also synthesized on the utilization of indigenous medical wisdom for MCH care; guidelines and operational tools were prepared to promote such utilization. Two manuals were prepared: (1) Manual for the people on health care for mothers and children, covering food for maternal and child health, indigenous practices for mothers and children, herbal drug recipes for mothers and children, and self-care experience of a model mother and child; and (2) Manual for health personnel at health-care facilities on MCH care with indigenous medical wisdom.

3. Operation and assessment

The study encouraged MCH care practices based on the guidelines and best practice models, and the use of the community MCH care manuals. These manuals are based on the knowledge synthesized from the operations at the subdistrict level. Trials were conducted for both manuals for community members and health workers. Training sessions including a group process were also held to facilitate the use of the manuals. House calls were also organized for women after giving birth. The use of MCH care manual should be promoted for postnatal women throughout the country.

Knowledge about maternal and child health care

According to a study on MCH care for Thai Muslims in five southern border provinces (Yala, Pattani, Narathiwat, Satun, and Songkhla) between 2005 and 2008, involving 41 TBAs (*toe-bi-dae*) by four southern research partners, the TBAs were found to play a key role in all prenatal, delivery and postnatal care. But similar studies in the other regions/areas (the North, the Northeast, the Central Plains, and the South, except the five border provinces), involving 20 TBAs during 2009–2015, the TBAs had a declining role in delivery care, but still active in prenatal and postnatal care.

The indigenous knowledge about MCH care can be arranged into two levels, depending on its difficulties or easiness: Level 1 for daily use and Level 2 for use at health-care facilities as a learning site or database and service provision for those who are ready to undertake self-care at home, see Table 4.3

Table 4.2 Role of TBAs in prenatal, delivery and postnatal care in five southern border provinces during 2005–2008 and other four regions/areas during 2009–2015

Care period	In five southern border provinces 2005–2008				In other four regions/areas 2009– 2015			
Prenatal	Herbal remedies for good health and prevention of morning sickness	Rituals for easy childbirth and healthy baby (*nae-ngae* rite and *i-tawa* bath)	Mental coaching for new mother	Abdominal massage during pregnancy for fetal position adjustment	Herbal remedies for good health and prevention of morning sickness	Herbal remedies for healthy pregnancy	Abdominal massage during pregnancy for fetal position adjustment	Assistance and advice on prenatal care
Delivery	Accompanying the mother to the hospital	Care in delivery room – encouragement through *du-ar* chanting, accepting the placenta from physician (ritual)	Care in delivery room – massage and encouragement	-	-	-	-	-
Postnatal	Hot brick (*kon-sao*) treatment, herbal bath, herbal steam bath	Rituals for babies: circumcision (*su-nad*), fireplace demolition (*rue-tao-fai*), and cradle and shaving ceremonies	Postnatal nutritional care, baby mouth-blessing ceremony	Massage for increasing breast-milk production and uterus restoration	Hot brick (*kon-sao*) treatment, herbal bath, herbal steam bath	Herbal remedies for increasing breast-milk production, golden age health promotion, and anti-fainting	Massage for increasing breast-milk production and uterus restoration	Postnatal nutritional care

Table 4.3 Classification of indigenous knowledge about MCH care

Indigenous knowledge	Level 1 Daily practice	Level 2 Health-care provider's practice
1. Routines Examples: showering, hair washing, choosing the right clothes, avoiding hard work, not leaving the house	**1. Routines** Examples: showering, hair washing, choosing the right clothes, avoiding hard work, not leaving the house	**1. Routines**: Examples: Rituals to boost mental and physical health of mother and child, or treating complications, according to the local beliefs in the North
2. Food - Making the right food choices	**2. Food** - Making the right food choices	**2. Food** - Education on food that benefits mother and child's health, prohibitions and cautions
3. Postpartum heat treatment - Postpartum routines	**3. Postpartum heat treatment** - Lying by the fire	**3. Postpartum heat treatment** - Education on lying by the fire - Services for postpartum women at the learning centre such as herbal smoke, advice on routines, and rehabilitation by a folk healer working at the centre
4. Rehabilitation - Herbal steam bath (*hom-ya*, or *ob-ya*) - Open fire treatment (*kan-yang*) - Hot stones (*khom-sao*) - Postpartum massage	**4. Rehabilitation** - Herbal steam bath (*hom-ya*, or *ob-ya*) - Open fire treatment (*kan-yang*) - Hot stones (*khom-sao*) - Postpartum massage	**4. Rehabilitation** - Herbal steam bath (*hom-ya*, or *ob-ya*) - Open fire treatment (*kan-yang*) - Postpartum massage
5. Rituals - Begging forgiveness from parents, husband and stove - Blessing ceremony (*su-khwan*)	**5. Rituals** - Begging forgiveness from parents, husband and stove - Blessing ceremony (*su-khwan*)	**5. Rituals** - *Du-ar* whispering/chanting - Placenta blessing

Table 4.3 Classification of indigenous knowledge about MCH care (continue)

Indigenous knowledge	Level 1 Daily practice	Level 2 Health-care provider's practice
6. Herbal use for recuperation Examples: drinks, bath and hair washing	**6. Herbal use for recuperation** Examples: herbal drinks, bath and hair washing	**6. Herbal use for recuperation** - Education on local herbs - Herbal services for postnatal care
7. Herbal use - To treat complications	**7. Herbal use** - Use of commonly found herbs	**7. Herbal use** - To treat complications
8. Prevention and treatment - For postpartum disorders	**8. Prevention and treatment** - For postpartum disorders	**8. Prevention and treatment** - Education about postpartum disorders

The classification was followed by the publication of manuals on how to apply indigenous wisdom in MCH care in daily life. The manuals as well as the application of indigenous knowledge by folk healers are widely promoted in many areas. The in-depth study of the indigenous knowledge (Level 2) and the integration into government health-care system has also resulted in the preparation of MCH care manual for health workers in different local cultural contexts.

Integration of indigenous medicine into government health-care system

1. Use of indigenous medical knowledge for MCH care in the state health-care system – according to the case study, there are three models of MCH care as follows:

1.1 One-stop services at health-care facilities including childbirth and childcare by a modern medical doctor; the arrangements of state health-care units are undertaken as per local beliefs, culture and religion.

1.2 Joint MCH services by state health-care facilities and TBAs in the community. Communication symbols for the referral of cases and compensation

payments using "coupons" for local TBAs (*toe-bi-dae*) have been designed or developed as evidenced in the cases of Chanae district in Narathiwat province and Yarang district in Pattani province.

1.3 Postpartum care at state health-care facilities is provided by TBAs (*toe-bi-dae*). For example, in Yarang district, TBAs are invited to give postpartum massage at Yarang Hospital. Anyhow, some obstacles are encountered such as an old TBA's inconvenience when travelling to and from the hospital, and her unfamiliarity with the hospital setting. Importantly, the postpartum mother has to be cared for by the TBA with whom the mother has had antenatal care. That reflects the relationship between the pregnant woman and the TBA. The relationships are not only between the care-provider and the care-recipient, but they are in other dimensions such as being a family TBA with an especially broader bond, unlike a giver-receiver relationship in the modern medical system.

2. Utilizing indigenous medical wisdom for MCH care in the community

Prenatal and postnatal care is undertaken in a parallel manner by TBAs and the local health-care facility. The TBA's care is based on local culture in the community, including rituals, prenatal massage, herbal remedies, and health promotion without any formal support from the public sector.

Relevant policies

1. The National Health Security Office has included TTM services for postpartum women, including massage, herbal steam bath, herbal compress, hot salt pot compression, and postpartum advice, under its National Health Security Fund. This emphasizes the importance of indigenous medical wisdom in postpartum care; and it also makes TTM and herbal services more accessible to the Thai people with more confidence and utilization.

2. The Ministry of Public Health has set a policy to provide health services to ensure the people's healthy status, physically, mentally and emotionally, in society with happiness in five different age groups: (1) women and children aged 0–5 years, (2) schoolchildren aged 6–14 years, (3) teenagers, (4) working-age people, and (5) elderly and disabled persons. The use of indigenous medical wisdom for maternal and child care as per their age groups can be regarded as an effort to encourage

self-reliance in health care as per their roots, ethnicity, and thinking system, and to reduce social expenditures.

Recommendations

Providing more alternatives for local communities under the 2007 National Health Act equires the planning and development processes between local government organizations and TBAs, or a community folk wisdom network, in setting a budget for TBA's maternal and child care and knowledge transfer in the community.

Long-term promotion and development

Formulating a master plan for systematically reviving and promoting the use of indigenous wisdom in MCH care by integrating such services into area-based or *tambon* (subdistrict) health development plans.

Promoting further research on the development of indigenous knowledge-based MCH care by TBAs at a higher level, using multi-wisdom approach such as herbs for MCH care, and postnatal massage for a faster uterus restoration.

4.3.3 Indigenous wisdom and development of curriculum to promote bone healers' capacity in the community

"Bone healers" or folk healers who treat bone fracture with local health or medical wisdom or knowledge are extremely important for the people's health because as many as 2,652 bone healers out of all 54,304 folk healers are in all regions of the country (Central Registrar's Office, December 2013). They have been playing an important role in caring for the people in their communities, especially those who live in remote areas, or cannot have access to state health services, because such people still have faith in indigenous healing practices.



Folk healing of bone fracture is a valuable alternative for Thai society. So DTAM's Bureau of Thai Indigenous

Medicine has mapped out a plan to study and enhance the capacity of indigenous bone healers. It started with the study of treatment efficacy by bone healers, involving the healers' background, procedures, and treatment outcomes. The study was conducted in nine provinces in three regions of Thailand: Chon Buri, Sing Buri, Lop Buri, Prachin Buri, Saraburi, Ayutthaya, Chiang Rai, Uttaradit, and Nakhon Si Thammarat. It was approved by the Ethic Committee for Research in Human Subjects in the Fields of Thai Traditional and Alternative Medicine.

There were in-depth interviews on the bone healers' background and the clinical evaluation of the treatment outcomes by the orthopedists who visited the research sites and constructed evaluation tools and mapped out procedures for the study. This is also an innovation on methodology. The research involved 216 patients in 12 groups of injuries in the arms and legs (non-open fracture). There were two types of evaluations: the evaluation of the shape of the broken bone from x-ray films after treatment and the evaluation of the patient's ability to use the limb from the tests of joint movements.

The background interview revealed that most healers are well respected and highly trusted senior members of the community who also have other responsibilities in community work. The villagers are proud to have their own healers who are usually respected by residents of nearby communities as well. The healers have already had a main income source such as agriculture. These healers have sworn to uphold a set of virtues so they do not ask for payment from their patients. However, the patients would still pay them back as a way to show their gratitude. The healers' houses are similar to other villagers' in the same community. The only difference is a larger area that can be used for the treatment processes, as well as a lobby space for patients and their relatives. Their training involves learning by doing. They started as an assistant to their mentor, learning how the treatment was performed. Then, they started curing non-serious symptoms and later conducted the full treatment on patients. The knowledge transfer process with details or supplementary techniques was dependent upon each individual mentor/teacher's practices.

The study of their treatments found several methods with similar procedures: interview on patient's history, diagnosis, paying respect to the teachers, light massage of the affected area. They usually use sesame oil, coconut oil, or chamois oil boiled with other herbs such as *phlai*, turmeric, and lily leaves. These herbs are known to help connect bone fractures and muscles. After the massage, the healers pull and adjust the bone. Some of them also cite bone-connecting chants. Later, the healer uses custom-made wood splint with cotton pads or gauze lining to prevent friction to the skin as well as absorb the herbal oil for less inflammation and better healing. The rope is then used to secure the splint which is usually made of bamboo pieces tied together. Bamboo is locally available, lightweight, comfortable, and has good ventilation. Wearing a bamboo splint is less uncomfortable than wearing a plaster one. Some healers may use a PVC pipe cut in half as the splint, which can be heated and bent to fit the patient's organ. After the splint is put on, some healers will meditate, chant the mantra, and blow on the affected area.



Photo 4.1 Moh Samrit Jamnaekwuth, a folk healer in Ayutthaya, examines/ palpates the patient's deformed organ.



Photo 4.2 Moh Khian Muangmoon, a folk healer in Chiang Rai, is putting a splint on the patient's arm.



Photo 4.3 Use of a cotton pad on top of a bamboo splint to prevent pressure sores on the skin of the patient.



Photo 4.4 Wood splint that can be bent to fit the patient's curved arm.

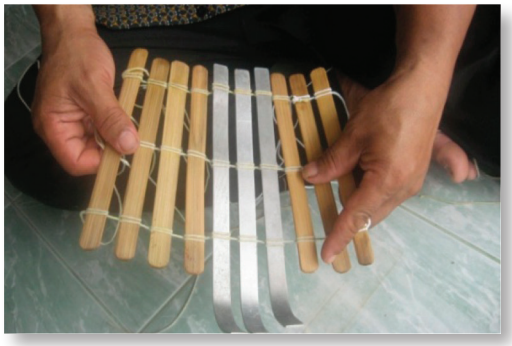
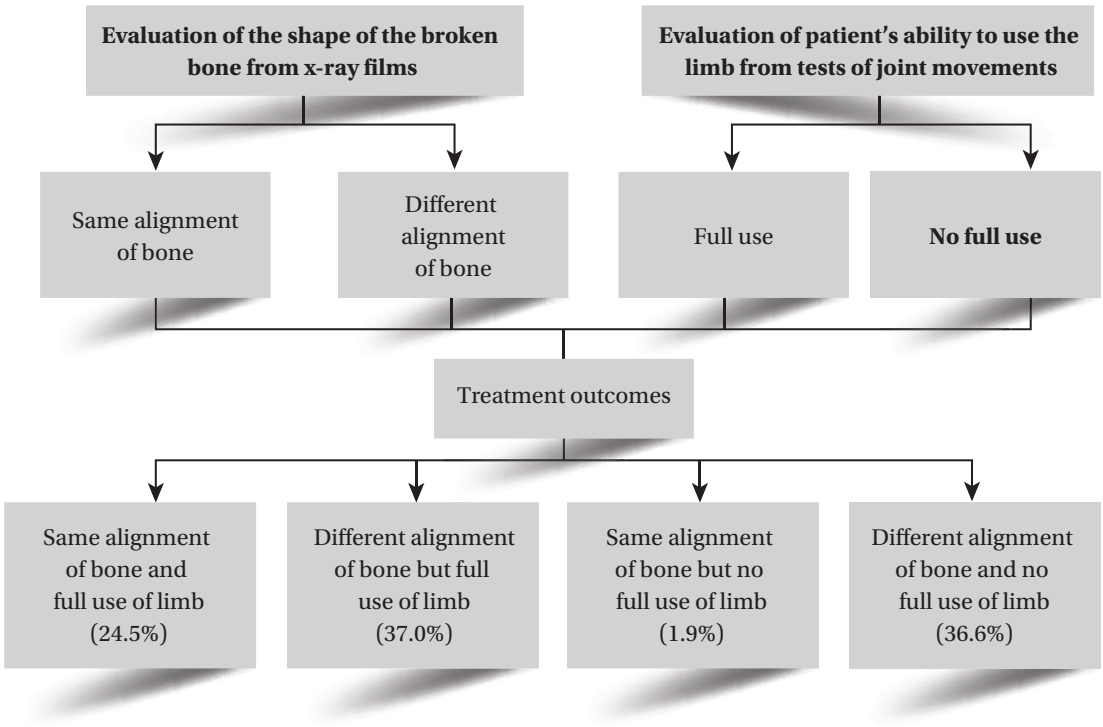


Photo 4.5 Wood splint to be fitted on the patient's curved arm by a folk healer

Most folk healers believe that the chanting helps heal the broken bones. It brings about trust and comfort to the patient and his/her relatives. The patient is told to avoid using the broken bone while under treatment. He/she is also advised against consuming "forbidden" food (such as scaleless fish, leftover food from the previous day, meals from the funeral reception, preserved food, or alcoholic drinks). The patient also needs to come back to the healer for regular checkups.

The results of the study on the efficacy of the bone fracture treatments of 216 patients in 12 injury groups by three orthopedists (the evaluation of the shape of the broken bone and the evaluation of patient's ability to use the limb from the tests of joint movements) are shown in Diagram 4.4.

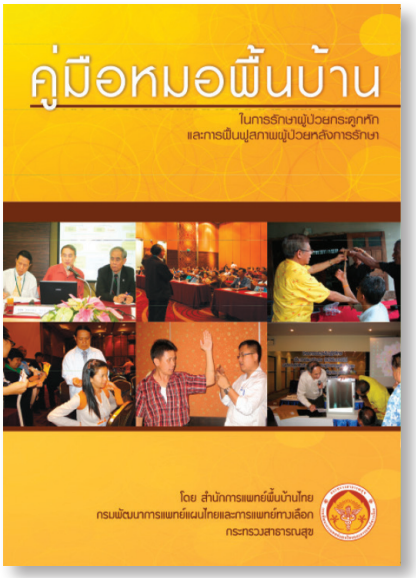
Diagram 4.4 Overall evaluation procedures of broken bone treatment



The results can be categorized into four groups: Group 1, same alignment of bone and full use of limb (24.5%) – the folk healers in this group can effectively treat bone fracture if the patients are not seriously ill and have non-open fracture with no dislocation; Group 2, different alignment of bone but full use of limb (37%); Group 3, same alignment of bone but no full use of limb (1.9%); and Group 4, different or abnormal alignment of bone and no full use of limb (36.6%) – for the patients with an abnormal bone alignment, the folk healers cannot treat as they lack modern equipment.

The study has suggested that for the bone fracture patients with an open wound, a serious fracture near the joint, or a large bone fracture, the healers should advise such patients to go to the hospital where bone surgery and x-ray as well as other equipment are available.



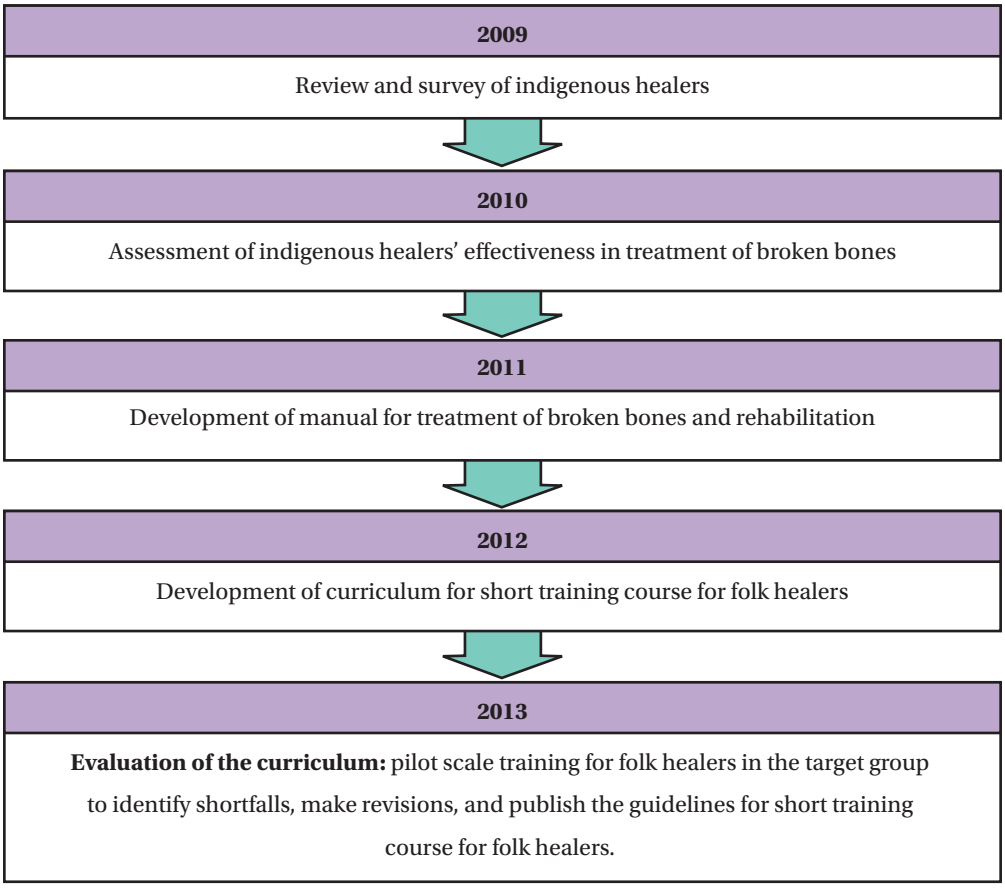


The result of the study suggests that there are some types of injuries with full recovery and others with limitations. The latter suggests that more knowledge revision or revival should be sought. The patients may be satisfied with the results but the orthopedic expert evaluations prove otherwise. It is likely that the patients may have problems with the treated injury later in life. What is needed is the right education and training for the healers. They need to be able to decide which kind of injury can be possibly treated. They also need training on patient rehabilitation and post-treatment follow-up care. The study has also found that most of the indigenous healers are not familiar with the procedures of sharing knowledge and thoughts to facilitate the operation of a network. They do not have the trust or cooperation from modern medical practitioners. Thus, they lack further capacity development and their efficacies are not accepted by personnel in the modern medical and public health system. As a result, it is difficult to carry out further development efforts.

In this connection, the Bureau of Thai Indigenous Medicine has developed a manual for folk healers to deal with broken bone treatment and rehabilitation. The manual is accompanied by training and seminars for folk healers all over the country. The focus is on the handling of injured limbs, splinting of collar bones, pulling of finger bones, evaluating mobility, and rehabilitation. All this, including training the healers on preliminary diagnosis and decision-making on whether or not they should proceed with their healing procedures, helps make them better healers for their communities. The results were published in the research report on the Effectiveness of Bone Fracture Treatments by Indigenous Healers. For further dissemination of knowledge on the matter, the manual for bone healers has been published for broken bone treatment and rehabilitation at the community level.

In addition, DTAM's Bureau of Thai Indigenous Medicine has conducted a study on development of a curriculum on effective treatments of broken bones for folk healers based on the result of the previous study. The curriculum covers modern orthopaedic practices to empower the folk healers in a systematic manner, using the development framework and integrative learning concept. That is based on folk healers' needs and the fundamentals of orthopaedics, so that the folk healers can enhance their capacity and efficiently apply the knowledge for patient care. It is hoped that the curriculum will be the guidelines for helping folk healers apply the knowledge and transfer what they have learned about modern medicine to the new generation of folk healers. This is the conservation of wisdom that matters to the society and will lead to the development of the public health system that will be well accepted.

Diagram 4.5 Five-year plan to study and enhance folk healers' capacity in broken bone treatment (2009–2013): conclusion and future development guide



Conclusion and recommendations for further development

1. A good lesson learned from the study is the cooperation of folk healers in the study areas, orthopedic experts, and other doctors in the multidisciplinary team at health-care facilities; they have learned from one another and jointly developed tools to evaluate the efficacy of treatment by the bone healers. This is an innovation in the application of knowledge for developing indigenous wisdom of bone healing.

2. Indigenous medicine is still chosen by the people who live in remote areas. Even with the universal health coverage scheme covering all areas, many cases actually need to be referred to a higher level of care, but the patients and their families still choose indigenous medicine because of their financial status.

3. The effort for capacity building of folk healers in local communities with the jointly designed curriculum should be supported. This should be done collaboratively by health agencies and *tambon* (subdistrict) administrative organizations, using the "Community Health Security Fund".

4.3.4 Indigenous wisdom in the treatment of venomous animal bites: the integrated use of modern medicine and Thai traditional and indigenous medicine in community hospitals

The indigenous wisdom on venomous animal bites, including snakebites, exists because of many reasons: inconvenient transportation in remote areas, the adjustment to the changing social context by the healers as well as their virtues, understanding of patients' needs, friendliness, and ability to neutralize the poison, alleviate pain and infection. Also, modern medicine requires a longer observation time which makes patients develop necrotic tissue on their wound, resulting in a longer period of treatment.

The survey by the Bureau of Thai Indigenous Medicine with the cooperation from provincial public health offices and *tambon* (subdistrict) health promoting hospitals (THPHs) in 50 provinces in 2010 has found 417 folk healers specializing in treating venomous bites. Of all the healers, 302 specialize in treating animal/insect bites, 242 in treating snakebites, 60 in treating chronic snakebite wounds. Regarding their healing methods, 251 healers use herbal drugs, 346 use chanting/blowing, 49 use holy water, and 20 use medicinal tattooing. This demonstrates the variety and potential of Thai indigenous medical wisdom.

Snakebite and chronic wound treatments by folk healers vary in different regions of the country. Some healers use ground herbs, decoction, and tattooing; some remove the patient's contaminated blood while some perform chanting. The efforts mostly focus on the neutralization of the poison, alleviation of pain and infection, and prevention of ulceration. Some patients go to the hospital to get anti-venomous serum and then go to folk healers to have their wounds treated as they believe that with folk healing they would not have chronic or ulcerated wounds. Generally, the folk healing procedures include:

1. Blocking the venom from reaching the heart with herbs, incantation, or boundary marking between the wound and the heart.

2. Neutralizing the poison by incantation, herbal concoction, tattoos on the skin bridging the fingers and toes, herbal immersion, herbal application on the wound, etc.

3. Herbal treatment of ulcerated or necrotic snakebite wounds with herbal application on the wound, immersion, and fumigation, etc.

4. Cautions during treatment. The cautions are related to food or previous treatments. The patient is required to inform the healer before going to get treatment from another healer, or discontinue the treatment with someone else before coming to the healer.

5. Other treatments such as snakebite prevention tattoos.

The integrative effort of modern medicine and Thai traditional and indigenous medicine in community hospitals started in Kap Choeng Hospital in Surin province. In 1988, the then hospital director became interested in finding out the treatment result of a snakebite patient who turned down hospital treatment and sought a folk healer's help instead. In the beginning the hospital sent for Moh Ia Saikrasun, a folk healer with simple (non-incantation) treatment procedures, to provide treatments to patients at the hospital and train hospital workers. Since 1992 a hospital worker was assigned the duty of making ground herb for snakebite treatment. Later when the health worker resigned, the duty was taken over by other hospital officials, but the herbal drug did not have the same efficacy. That was the start of developing a proper herbal drug preparation with constant efficacy, which has led to the production of *Lod Thanong Daeng* (*Trigonostemon reidioides* (Kurz) Craib) powder remedy in 1997.

In 1996, after Moh Ia Saikrasun's return to his home-based practice in Surin, Ban Run Health Centre in Bakdai subdistrict, Phanom Dong Rak district, close to his house started referring snakebite patients to him. This practice continued until 2006 when Phanom Dong Rak Chaloem Phrakiat Hospital was newly established. However, because the care and follow-up work was not convenient, the hospital decided to ask the healer to come to the hospital instead. After that, a lot of snakebite patients came to the hospital because they had confidence in the integrated treatment provided by the folk healer and the hospital's modern medical doctors.

In 2009 and 2010, the Bureau of Thai Indigenous Medicine conducted an in-depth study into the efficacy of the indigenous healer's snakebite treatment in two community hospitals: Kap Choeng and Phanom Dong Rak Hospitals. The study covered the efficacy, diagnosis, treatment and clinical data collection. The patients were found to have less pain and leave the hospital sooner; most of them were cured and could go home in 1–2 days. The results showed that indigenous drug/wisdom can treat ulcerated snakebite wounds and is very useful in the development of treatment procedures and the integration of indigenous medicine into the formal health system for snakebite treatment.

In 2011, hospitals in Surat Thani province started to use *Lod Thanong Daeng* remedy for snakebite treatment. A Thai traditional medical practitioner who was once a student trainee at Kap Choeng Hospital in Surin province proposed the use of this herbal remedy in Surat Thani's community hospitals to reduce spending on serum reserve to the Provincial Thai Traditional Medicine Committee. Modern medical doctors with experiences in the herbal snakebite treatment in Surin were invited to share their knowledge in Surat Thani. After that the remedy was adopted for use in three community hospitals: Khian Sa, Khiri Rat Nikhom, and Vibhavadi. Each of the hospitals independently developed its own herbal procedures in line with the modern medical principles.

In 2014, the Bureau of Thai Indigenous Medicine conducted a study on the use of *Lod Thanong Daeng* remedy in five community hospitals: two in Surin (Kap Choeng and Phanom Dong Rak) and three in Surat Thani (Khian Sa, Khiri Rat Nikhom, and Vibhavadi), involving 248 patients. Most of the patients had positive treatment results. This means the herbal remedy has potential to be used in other government health-care facilities. The data on its use can benefit further development in snakebite treatments.

Diagram 4.6 Timeline of herbal treatment for snakebites at Kap Choeng Hospital

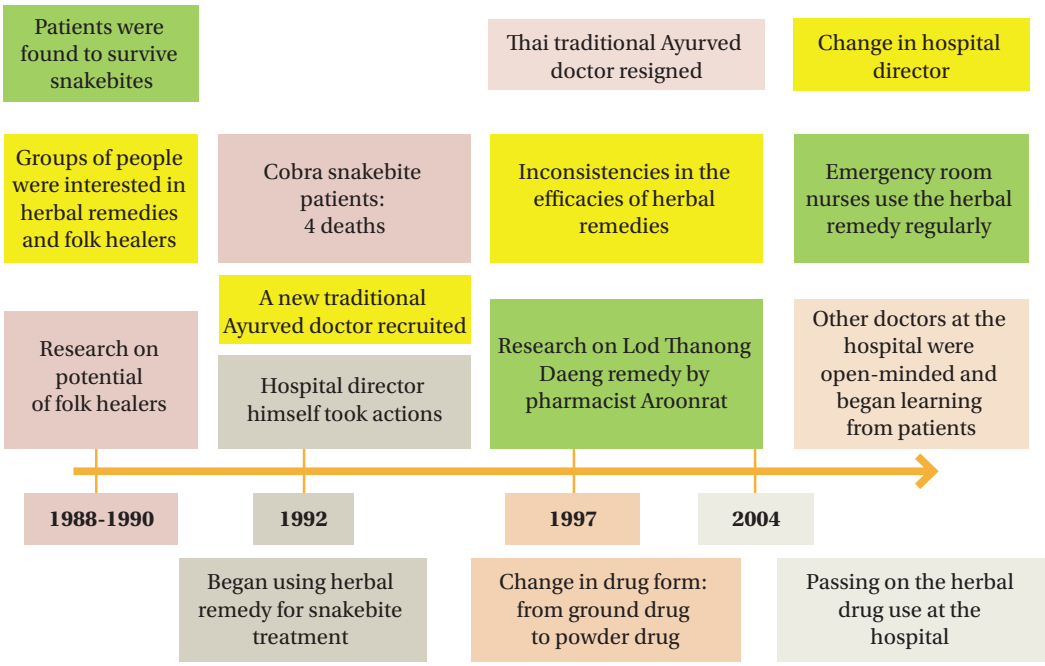


Diagram 4.7 Model of snakebite treatment with *Lod Thanong Daeng* remedy in a hospital

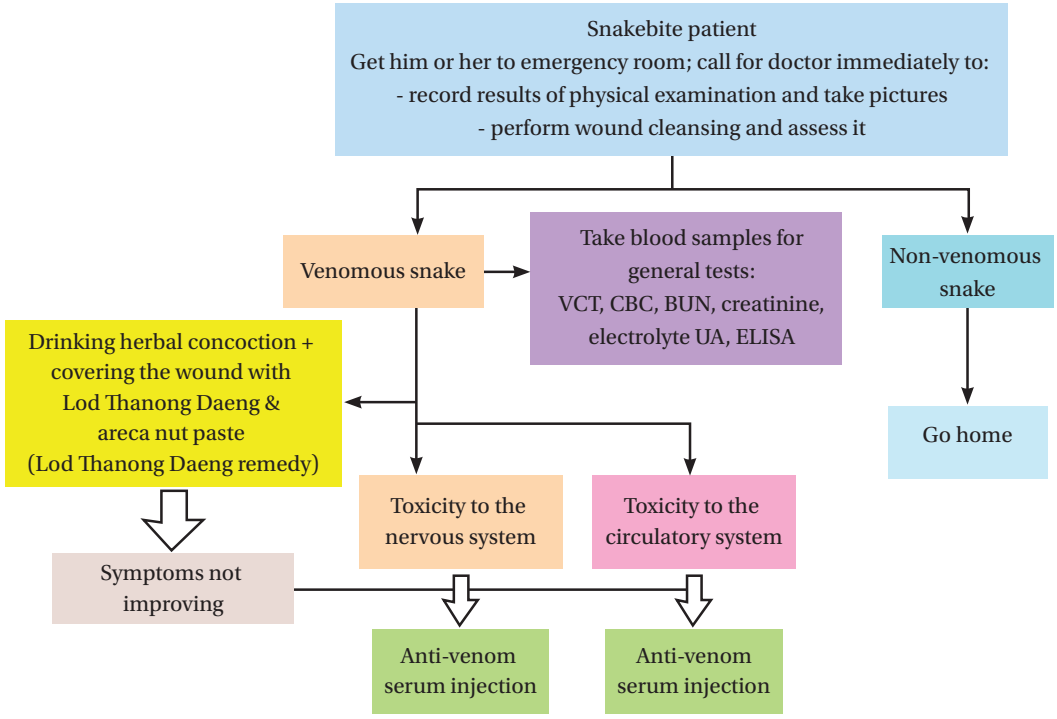
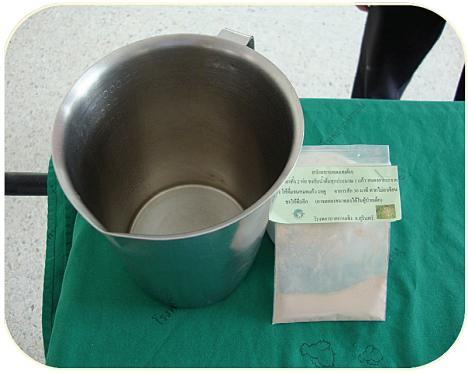


Photo 4.6 Forms of *Lod Thanong Daeng* remedy



Lod Thanong Daeng powder and crushed areca nut mixture paste for covering wounds



Lod Thanong Daeng powder and areca nut

Photo 4.7 The use of *Lod Thanong Daeng* remedy



Upper row: Herbal paste for application on wounds



Lower row: Herbal concoction or mixture for drinking

Conclusion and guidelines for further development

The application of indigenous wisdom for snakebite treatments at state health-care facilities may differ in each locality, depending on their social context, folk healers' personality, actual wisdom application, and other supportive factors. Identifying folk healers' knowledge for further improvement is a good start for the promotion of herbal use in the community. It reduces the costs of herb purchases and it can be an appropriate choice for treatment of snakebites in each community, chiefly depending on patient safety and satisfaction.

This integrative work on indigenous healing of snakebites in state health-care facilities has been going on for almost 20 years. It started as a personal interest and was later developed into *Lod Thanong Daeng* remedy (using herb *Trigonostemon reidioides* (Kurz) Craib and areca nut) of Moh Ia Saikrasun. Then the remedy was trialed in three hospitals under the Routine-to-Research (R2R) Programme by health teams and network members, all participating in determining the work process that fits in with their routines. The direct experience by the research team has made it easier to change health personnel's attitudes towards folk healers and indigenous medicine. Knowing the potentials of local wisdom, health workers are more confident in the efficacy of the remedy.

The tools for data collection were also developed such as photography, symptoms recording, diagnosis and clinical assessment of snakebite patients. The feedbacks were received after the results of this work had been disseminated by both provincial and central research team members. Many academics as well as folk healers' networks have become interested in the efforts. The remedy by Moh Ia Saikrasun has been registered with Kap Choeng Hospital as *Lod Thanong Daeng* remedy, a herbal hospital formulary, and available to deliver to other hospitals.

The Bureau of Thai Indigenous Medicine has published two books on this study: (1) Study, synthesis, and management of indigenous knowledge on venomous animal/snakebite treatment, and (2) Guidelines for the use of indigenous knowledge for snakebite treatment. The Bureau is now in the process of preparing another book on the lessons learned and development of snakebite treatment with *Lod Thanong Daeng* remedy.

Table 4.4 List of herbs used in the treatment of venomous snakebites and ulcerated snakebite wounds

Name	Scientific name	Treatment of snakebites	Treatment of snakebite wounds
1. Sea salt	-		√
2. Wild pig's fang (*hhiao mu pa)*	*Sus scrofa*	√	
3. Small Asian mongoose's fang (*khiao phangphon*)	*Herpestes javanicus*	√	
4. Crested serpent-eagle (*teen-hung* or *yiao-rung*)	*Spilornis cheela*	√	
5. *Kled nakkaraj*	-	√	
6. *Khedmon,* or *khadmon*	-	√	
7. *Khoei tai mae yai chak prok*	-	√	
8. *Khruea thai song*	-	√	
9. *Chiangpra* or *ti phi tai*	*Corallia brachiata* (Lour.) Merr.	√	
10. *Thao khan daeng*	-	√	
11. *Saled pangpon tua mia*	*Clinacanthus nutans* (Burm.f.) Lindau	√	
12. *Saled pangpon tua phu* or *ton khiao ngu*	*Barclaya lupulina* Lindl.	√	
13. *Lod thanong daeng*	*Trigonostemon reidioides* (Kurz) Craib	√	
14. Sensitive/sleepy plant (*mai-ya-lap*)	*Mimosa* sp.	√	
15. *Mai lai*	-	√	√
16. *Karawek*	*Artabotrys* sp.	√	
17. *Kratom*	*Mitragyna speciosa* (Roxb.) Korth.	√	√
18. *Komkoi lodkhon*	-	√	
19. *Kanlapaphruek*	*Cassia* sp.	√	
20. *Kang pla daeng*	*Phyllanthus reticulatus* Poir.	√	
21. *Kafak mai mao sian*	-	√	

Table 4.4 List of herbs used in the treatment of venomous snakebites and ulcerated snakebite wounds (continue)

Name	Scientific name	Treatment of snakebites	Treatment of snakebite wounds
22. *Kafak mai prai*	-	√	
23. *Kafak mai tangkuam*	-	√	
24. *Kafak mai namnae*	-	√	
25. *Kamlang thorapi ngoen*	-	√	
26. *Kamlang thorapi thong*	-	√	
27. *Khwao nam*	-	√	
28. *Khoi na*	*Streblus asper* Lour.	√	
29. *Jang hoi*	-		√
30. *Jik na*	*Barringtonia acutangula* (L.) Gaertn.	√	
31. *Chumhed thet*	*Senna alata* (L.) Roxb.	√	
32. *Chumhed thai*	*Senna tora* (L.) Roxb.	√	
33. *Sai den*	-	√	
34. *Ta suea*	-	√	
35. *Tum ka*	-	√	
36. *Tin tang tia*	-	√	
37. *Nom maeo*	-	√	√
38. Ramie or hemp (*pahn*)	*Boehmeria* sp.		√
39. *Phak sian phi*	*Cleome viscosa* L.	√	
40. *Phak bung khan*	*Ipomoea* sp.	√	
41. *Phluang*	*Dipterocarpus tuberculatus* Roxb.		√
42. *Phapphla*	*Microcos* sp.	√	
43. *Phung doh*	*Azima sarmentosa* (Blyme)Benth.	√	
44. Fig (*maduea hom*)	*Ficus* sp.	√	
45. Tamarind	*Tamarindus indica* L.	√	
46. Lime	*Citrus* sp.	√	√

Table 4.4 List of herbs used in the treatment of venomous snakebites and ulcerated snakebite wounds (continue)

Name	Scientific name	Treatment of snakebites	Treatment of snakebite wounds
47. Plum mango (*maprang wahn*)	*Bouea* sp.	√	
48. Coconut	*Cocos nucifera* L. var *nucifera*	√	
49. *Mahuad*	*Lepisanthes rubiginosa* (Roxb.) Leenh.	√	
50. Tobacco	*Nicotiana laurifolia* L.	√	
51. *Rangjued thao*	*Thunbergia laurifolia* Lindl.	√	
52. *Luk tai bai*	*Phyllanthus* sp.	√	
53. *Wahn maengmum* (like *wahn-ueng*)	*Eulophia* sp.		√
54. *Wahn khamin khom*	-	√	
55. *Wahn ngu jong ang* (*wahn ron thong, wahn phaya ngu*)	*Ludisia discolor* (Ker Gawl.) A.Rich.	√	
56. *Wahn phaya nakaraj*	-	√	
57. *Wahn sarapad pit*	-		√
58. *Wahn ueng*	*Eulophia macrobulbon* (Parish & Rchb.f.) Hook.f.		√
59. *Som ngua*	-		√
60. Neem (*sadao chang*)	*Azadirachta indica* A.Juss.		√
61. Cogon grass (*ya kha*)	*Imperata cylindrica* (L.) P. Beauv.	√	
62. Areca or betel nut	*Areca catechu* L.	√	
63. *Insee*	-	√	√
64. Java tea (*ya-nuat-maeo*)	*Orthosiphon aristatus* (Blume) Miq.	√	

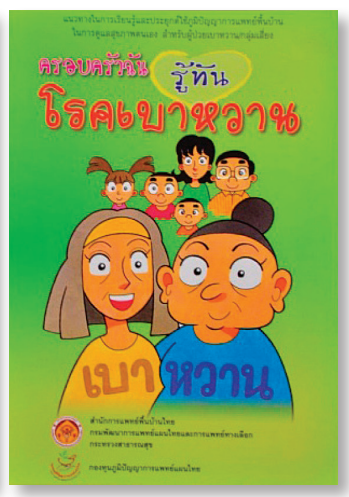
4.3.5 Indigenous wisdom for diabetes patient care

Diabetes is a disease in the group of **metabolic syndrome** and is a major public health problem. Every year more and more people's quality of life is affected by the problem. According to MoPH's statistics for 1999–2005, the number of inpatients and outpatients with diabetes increased each year and was on a rising trend; and its morbidity rate rose about twofold. The mortality rate due to diabetes also rose from 7.46 deaths per 100,000 population in 1997 to 10.59 per 100,000 in 2003. The trend has been rising with the changing environments and lifestyles.



In 2007, it was forecast that there will be 300 million diabetes patients worldwide by 2025. For Thailand, its medical expenditure has been on the rise, especially for the underprivileged and the indigent. The situation is so important that the government has to seek other health-care alternatives to reduce such an impact and health-care spending. It has been found that indigenous or folk healers still play a key role in providing medical treatment for the communities in all regions across the country. Hence folk healers should be involved in caring for diabetes patients in parallel with modern medical services in order to improve Thai people's quality of life.





In FY 2009, the Bureau of Thai Indigenous Medicine launched a project on community health management and development with indigenous medical wisdom in six provinces in all four regions of the country. The first phase involved a review of relevant research studies that reveal the status of local wisdom including indigenous medicine

that can be used in the prevention and treatment of diabetes both in terms of self-care and long-term health promotion. In this regard, the Bureau has prepared and published a book titled "Indigenous Medicine for Diabetes Care".

In FY 2010, the second phase of the project began with the knowledge management and development of care procedures for diabetes patients. The knowledge management procedures were prepared based on the field work with best practices in the primary care network. The project was undertaken in collaboration with 13 networks of diabetes care providers. With participatory knowledge management, folk healers' wisdom, and herbal research from the first phase, two more books have been published: (1) "Guidelines for Diabetes Patients Care with Indigenous Medicine for Health Personnel" for use by TTM personnel based on the integrative approach for primary medical care and community self-care; and (2) "My Family Knows about Diabetes", a comic book for diabetes patients and at-risk groups, illustrating how to apply indigenous wisdom in diabetes self-care.

In FY 2011, the Bureau launched another project on Development of Integrative Care with Local Health and Indigenous Medical Wisdom for Diabetes Care. The project designed a mixed model of health wisdom and indigenous medicine in four pilot areas for the evaluation of indigenous diabetes treatment and encouragement for the application of indigenous wisdom in diabetes patient rehabilitation, both in the primary medical care and community self-care systems. The four areas were: (1) Ban Nam Dip *Tambon* Health Promoting Hospital in Mae Yuam subdistrict, Mae Sariang district, Mae Hong Son province, (2) Khlong Bang Ping *Tambon* Health Promoting Hospital in Mueang district, Samut Prakan province, (3) Khlong Hin *Tambon* Health Promoting Hospital in Ao Luek district, Krabi province, and (4) Chaloem Phra Kiat Nong Hin *Tambon* Health Promoting Hospital in Nong Hin district, Loei province.

According to DTAM's 2006 survey, there were 52 folk healers treating diabetes in 13 provinces in the North, Northeast, and Central Plains of Thailand. Diabetes is known among folk healers as an illness with "sugary urine". The symptoms include excessive thirst and water drinking, frequent urination, increased heart rate, and fatigue. Usually, the patients have also been diagnosed at a hospital as diabetes. The illness is believed to be the result of weak liver and kidneys, arterial or

tendon dysfunction, over consumption of toxins or sugary/fatty food, and sedentary lifestyle. Around 40% of diabetes patients use both herbal remedies and modern medicine in their treatment. This may include the use of food supplements, traditional Chinese medicines, or other alternative medicines. There are two types of herbal medicines: single herbal drugs and herbal recipes. The single herbal drugs used include, for example, kariyat (*Andrographis paniculata* (Burm.f.) Nees), *bora-phet*, *luk-tai-bai*, pandan leaves, *ya nuad maeo*, *hanuman prasankai*, *in-tha-nin*, lemon grass, *mai-ya-rap*, wild betel or *cha-phlu*, *khrop-fan-si*, *ma-waeng-ton*, *ma-waeng-kruea*, *sak*, ivy gourd, star gooseberry, mango's parasitic plant or *ka-fark ma-muang*, *haem*, and *wahn-ngok*.

Diabetes herbal remedies which include the cure of diabetes wounds are found in the forms of decoction, bolus (*ya lukklon*), pills, and powder. The patients either grow and prepare their own herbs or purchase them from folk healers, traditional healers, traditional drugstores, healing monks (*moh phra*), traditional drug venders, or community hospitals. They spent a maximum of 100 baht on each purchase. It was found from the assessment of the patients that their blood sugar levels had decreased. They also had better physical and mental health conditions. Some patients, however, experienced some health problems so the use of herbs should be limited to a certain period of time. Research on toxicology has found that some herbs such as *cha-phlu, bora-phet*, or bitter gourd, can disrupt the function of liver cells.

As for the health care for diabetes patients and high-risk groups, it was found that, in addition to using herbal drugs, community members used some local vegetables such as holy basil, garlic, wild betel or *cha-phlu* and pandan leaves, ivy gourd, *bora-phet*, *fa-thalai-jon*, beal or *ma-toom*, wild bitter gourd (*mara-khi-nok*), *mawaeng-ton*, *ya-nang*, and aloe as their food for health benefits. Local food recipes and certain exercises were also part of the self-care such as long-stick exercise, *Ruesie Dutton* (self-stretching exercise), and coconut-shell (*kala*) walking. There was also foot-care practice to prevent wound occurring. Na Bua *Tambon* Health Promoting Hospital in Phitsanulok and Thoeng Hospital in Chiang Rai have their own foot-care procedures. The treatments include stress management with body massage, facial massage, reflexology, prayers, and meditation. The patients need to understand that "self-care is not only diet and sweet control or regular exercise,

but the most important thing is to remain calm and know when to let go. If you are happy and stress-free, your blood sugar levels will decrease naturally; no need to worry about high or low blood sugar levels."

Three examples of indigenous medicine usage for diabetes prevention and care by primary care providers are:

(1) Kut Chum Hospital, Yasothon province. "*Cha-Phlu* Herbal Tea" is included in the list of hospital formulary for the treatment of diabetes patients with a blood sugar level higher than 200 mg/dl. The hospital's Thai Traditional Medicine Clinic also sells herbal diabetes decoction based on indigenous remedies. However, patients are advised against continuous use of the herbal remedy for more than one month.

(2) Wang Nam Yen Hospital, Sa Kaeo province. The hospital's four procedures of diabetes treatment include: (a) giving health advice for changing patient's lifestyle related to exercise, stress management, diets, and herbal use; (b) examination and massage (including herbal compress) of the patient's hands and feet; (c) giving diabetes remedy "Mathumeha" composed of 20 herbs in the bolus form; and (d) promotion of healthy or balanced lifestyle for high-risk groups.

(3) Thoeng Hospital, Chiang Rai province, using three treatment procedures: (a) patient training on traditional and alternative medicine; (b) giving herbal drugs under the integrative traditional and indigenous medical approach in the forms of capsules and decoction under the care of the TTM Clinic, depending on the patient's desire; and (3) foot treatment with herbal immersion.

Besides, several other hospitals (including *tambon*/subdistrict health promoting hospitals, or THPHs) also use indigenous knowledge of diets, prayers, meditation, yoga, and other alternative medicine techniques in diabetic patients' self-care and diabetes prevention for those at risk. For example, Lampang Luang THPH in Lampang tried to determine the size of a single serving sticky rice container or box for diabetes patients; Kut Chum Hospital in Yasothon studied the sizes of sticky rice containers for male and female patients; and Na Bua THPH in Phitsanulok and Saliam Wan THPH in Lampang encouraged the cultivation and consumption of local vegetables for self-care and diabetes prevention.

Conclusion and findings

1. There was a compilation of studies on herbs with medicinal properties for reducing blood sugar between 1982 and 1998 from within Thailand and abroad. The effort carried out by the Department of Medical Sciences (DMSc) and Chiang Mai University's Faculty of Pharmacy has found that 50 to over 1,000 types of herbs are used in the treatments of diabetes. Based on local experiences and DMSc' guide for further research on new herbal drug development (1998), 10 types of such herbs should be further explored and developed as safer and more efficient medications for diabetes. They include *ni-kho-ra-tha* or banyan tree, ivy gourd, bitter gourd, onion, lotus (*bua luang*), *bo-ra-phet*, beal (*ma-toom*), garlic, holy basil and aloe vera.

Many of these plants are used in traditional food recipes and many health-care units have already included some blood sugar-lowering recipes and drinks in the menus for their diabetes patients.

2. Studies on diabetes herbal remedies have shown that these remedies have been used by traditional and folk healers for more than 90 years. The diagnosis and explanation of causes are based on their experiences as well as on the science of modern medicine. A total of 106 herbal recipes for diabetes were found, each consisting of 2 to 50 herbs. They have also set out guidelines including "dos and don'ts" for their patients. These recipes consist of several groups of herbs for reducing blood sugar, relieving muscle pain, curing lymphatic disorders, and treating urinary and kidney disorders. Two studies on diabetes remedies have found that a herbal drug recipe was able to reduce the blood sugar level in lab animals, but there were problems in identifying the species of the herbs. Thus, experiential knowledge of traditional and folk healers should be further managed for diabetes treatment purposes.

3. A study on rice strains for diabetes control has shown that *hom mali daeng* rice and *sinlek* rice have higher contents of nutrients, fibre and vitamin B6 than *hom mali* brown rice.

4. Guidelines for the application of local wisdom or indigenous medicine in diabetes treatments are as follows:

4.1 Policy. A survey should be conducted on the overall use of complementary medicine by diabetes patients. There should be a support mechanism to make Thai traditional, indigenous and alternative medicines safer and more effective for the treatment of diabetes. Research funding agencies should support studies on complementary medicine in diabetes treatment and the use of herbs in combination with modern medicine.

4.2 Operations – The health team should undertake the following:

4.2.1 Enhance diabetes patients' self-care skills for both individuals and groups. (This may be a learning module on self-holistic care for diabetes patients.)

4.2.2 Facilitate trust in self-care and assessment by patients, especially in terms of information on the use of integrative complementary and modern medicine.

4.2.3 At the primary care network level, share experiences and manage the information among team members to facilitate joint learning and keep the care appropriate to the real situation.

4.2.4 Study the use of local wisdom or indigenous medicine in diabetes patients in their designated area.

4.2.5 Undertake studies and keep track of research on herbs, herbal products, and food supplements for diabetes care so that the information will be useful for the patients.

4.3 Technical services – Technical units/institutes should systematically develop a database and a knowledge management system on herbs with diabetes care properties so as to obtain the knowledge that is really useable.

4.3.6 Indigenous medical knowledge for treating paralysis patients: close-to-home health care for the bedridden

Paresis/paralysis or stroke is the world's third leading cause of death. It is also a major cause of serious disability. There are 10-15 million new cases of strokes every year worldwide; half of them die, while the other half are permanently disabled. In Thailand, the number one cause of death in 2009 for both men and women is stroke. The disease, which is a threat to the world's population, is caused

mostly by inappropriate health habits such as consuming too much salt, sugar, fat, physical inactivity, alcohol drinking, smoking, and stress. Eventually, these habits will result in high blood pressure, diabetes, and high blood cholesterol, thereafter increasing the risk of stroke.

In Thailand, the revival and integration of traditional medicine into modern medical services, especially the primary health care programme, has been going on for nearly 30 years. Currently, DTAM is responsible for all actions required under the 1999 TTM Knowledge Protection Act.

As for indigenous medicine, a non-formal medical care system, the wisdom or knowledge has been learnt through practice and passed on from generation to generation through apprenticeship. The apprentices may be the master's children, grandchildren, or former patients. The learning process is based on the traditional and cultural conditions. Each healer differs in their practice, both in terms of treatment procedures and the herbs used. This makes it difficult to motivate the western medical system to be confident in the treatment efficacy of indigenous healers.

At present, according to DTAM's Central Registrar's Office, there are 57,665 registered folk healers (May 2016), 16,000 of whom have had more than 20 years of community health-care practice. This clearly confirms the existence and crucial role of indigenous health/medical wisdom both at the family and community levels.

In 2012, the MoPH issued a policy to promote and develop Thai traditional, indigenous, and alternative medicine at all levels of the public health system. Under DTAM, there are six health-care units, including the Thai Traditional and Integrated Medicine Hospital in Bangkok, which offer Thai traditional, alternative and indigenous medical services.

In FY 2014, upon opening of TTM service units, the Bureau of Thai Indigenous Medicine invited folk healers with expertise in paresis/paralysis treatment to come to the Thai Traditional and Integrated Medicine Hospital on Tuesdays, Wednesdays, and Fridays. Ayutthaya-based folk healer Mr. Sa-nga Pansaisri, together with his son and daughter, provided fire or heat trampling massage (*yam-khang*) on Tuesdays. Mr. Inson Sitthitan, a folk healer from Lamphun, gave hammer massage (*tok-sen*) on Wednesdays. On Fridays Lop Buri-based folk healers, Mr. Sombat

Wongkham and Sub-Lieutenant Narongchai Poomchuang, provided massage with heated herb-hands (*tob-lek-daeng*). This has made indigenous medicine better known and more accessible in the urban community. The move received positive feedback from patients seeking alternative treatment other than Thai traditional massage. Many patients who were treated by indigenous doctors felt better both physically and mentally. They became more mobile and were able to help themselves in their daily routine. With indigenous healers' friendly manners, the patients felt more relaxed and tended to talk with the healers throughout the treatment.

During the same fiscal year, while the indigenous medical services were being provided at the Thai Traditional and Integrated Medicine Hospital, the Bureau recorded the knowledge from the three folk healers, including massage-lines, acupressure, herbal compression, fire/heat trampling massage, massage with heated herb-hands, hammer massage, and herbal remedies. This is to be used for preparing guidelines for paresis/paralysis patient's care for Thai traditional doctors in other state health-care facilities.

Also in FY 2014, the Bureau of Thai Indigenous Medicine conducted a study and synthesis of indigenous medical knowledge for treating paresis/paralysis from senior healers and got the knowledge passed on to younger generation of traditional and folk healers. Phase 1 was the collection of knowledge about such treatment from 21 folk healers in 16 provinces all over the country. Forty-three Thai traditional healers working in the subdistrict and district (community) hospitals in same community with the healers were responsible for the documentation of the knowledge.

In FY 2015, phase 2 of the study was undertaken and involved another 21 folk healers in 15 provinces with 44 Thai traditional healers working in the subdistrict and district (community) government hospitals in same community responsible for the recording of the knowledge and healing procedures.

Based on the lessons learned, DTAM has realized the need for the study and synthesis of folk healing wisdom for treating paresis/paralysis. And there was a need for getting young Thai traditional doctors involved in the project to study and synthesize folk healer's knowledge on such treatment. As Thai traditional doctors have had academic background that facilitates research for higher treatment efficacy for bedridden patients, who have difficulties with their daily routines. Young Thai

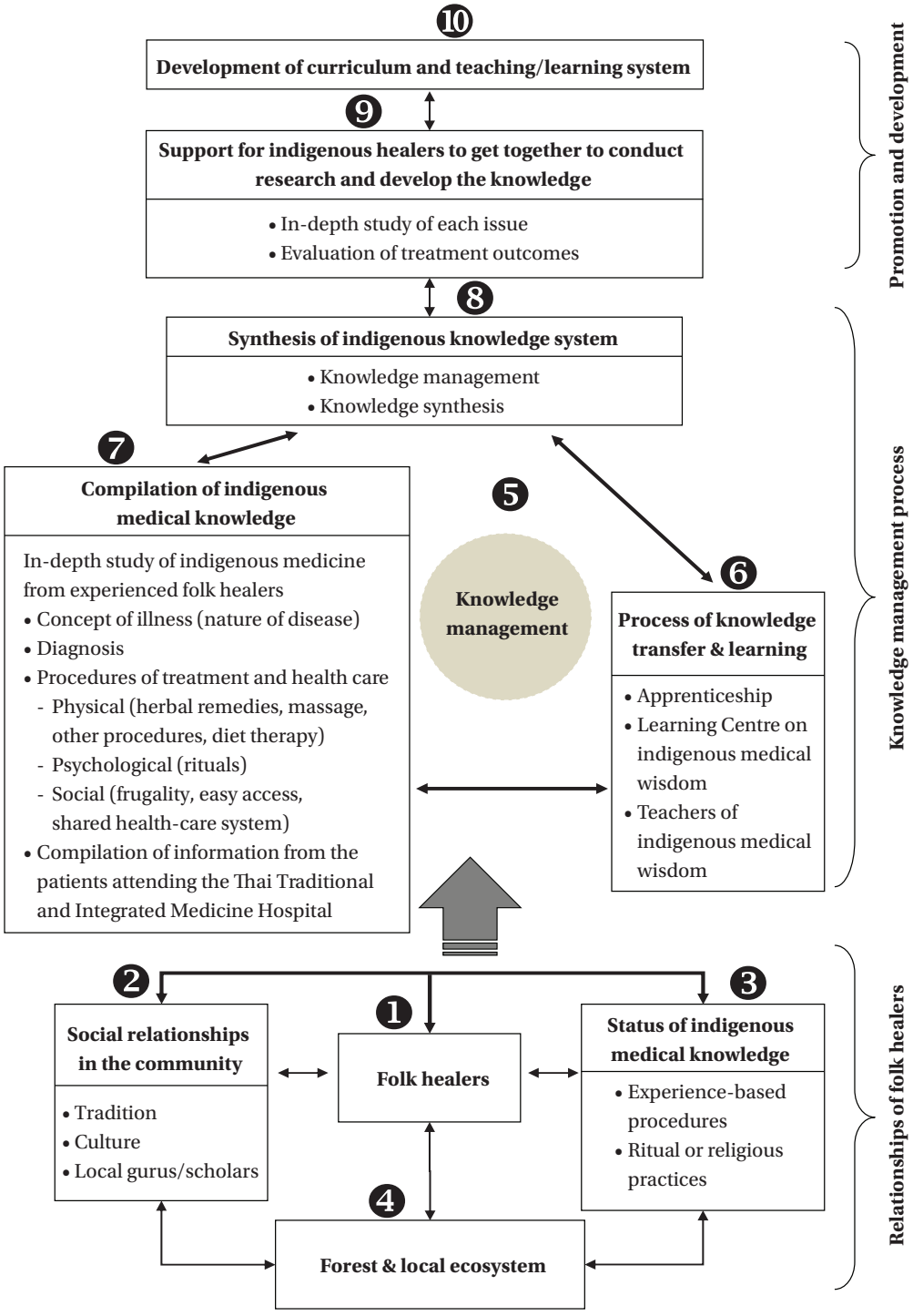
traditional doctors had the opportunity to observe and learn the local procedures from the senior indigenous healers, especially massage techniques, herbal remedies, and innovations in using local materials in making assistive treatment/rehabilitation tools that helped the patients with their daily routines – standing up, walking, eating, drinking and changing clothes.

The study of 42 cases in four regions has found that the diagnosis procedures are similar. The differences lie in the treatment procedures. Most healers assess the patient's physical appearance and find out medical history from the patients and their relatives. Medical doctor's diagnosis may also be used to find the cause of the illness. The folk healers from the four regions have similar massage principles for the arms, legs, and face; a massage spot on the collar bones can help the patients to lift their arms, a chin spot can fix slurred speech, and an abdomen massage to help relax the muscles. Besides, there are other treatments to help patients recover sooner such as sand therapy, herbal bath, heat trampling massage (*yam-khang*), and scrape/friction massage (*ched-haek*). Herbal remedies are also given to paresis/paralysis patients so that they have more bowel movement, less muscle stress, better blood circulation, and better sleep. After the massage, folk healers usually make simple rehabilitation tools for patients to use in their movement or exercise. After following the healers' advice, the patients were found to make good recovery; many of them could carry out their daily routines on their own after the treatment even though their signs of illness could still be noticed.

1) The relationships of indigenous medicine are as shown in the diagram above: (1) folk healers are community members with knowledge and experience in health care; (2) folk healers work with other community gurus in the context of culture, tradition, and forest/ecosystem (4); and the status of indigenous medical knowledge (3) can be classified into two major groups: experiential medical practices and ritual/religious performances. The relationships make the indigenous medical knowledge unique.

2) Folk healers have tacit knowledge (5) so the knowledge management process consists of (7) the compilation of indigenous medical knowledge, (6) the transfer of knowledge and learning, (8) the synthesis of indigenous medical knowledge with the understanding of its nature.

Diagram 4.8 The conceptual framework of the study and synthesis of indigenous medical knowledge or wisdom



3) Support and development of indigenous medical knowledge consists of (9) the support for indigenous healers to get together to conduct research and develop the knowledge and (10) the development of curriculum and teaching/ leaning system

Photo 4.8 Examples of physical exercise innovations devised by folk healers for paresis/ paralysis patients



Fabric swing to help patients exercise



Pants for walking exercise



Railing for walking practice

Photo 4.9 Folk healers' herbal remedies for paresis/paralysis patients in various regions



Photo 4.10 Various treatments by folk healers for paresis/paralysis patients in various regions



Heat trampling massage (*yam-khang*) | Sand covering therapy (*fang sai*) | Trampling massage (*yiap khlai sen*)

Indigenous medical wisdom is an alternative for community health care. Throughout their lives, people in the community seek knowledge and advice from the indigenous healers who may also have other social roles such as community leaders or spiritual leaders. The utilization of their wisdom can benefit community members from birth until death. It also helps facilitate the transfer of their knowledge and ideology to the next generation of folk healers so that they can also understand the contexts for synthesizing indigenous knowledge of various healing branches for paresis/paresis patients in the community.

4.3.7 Indigenous medicine for treating cancer patients: the knowledge that can be further developed

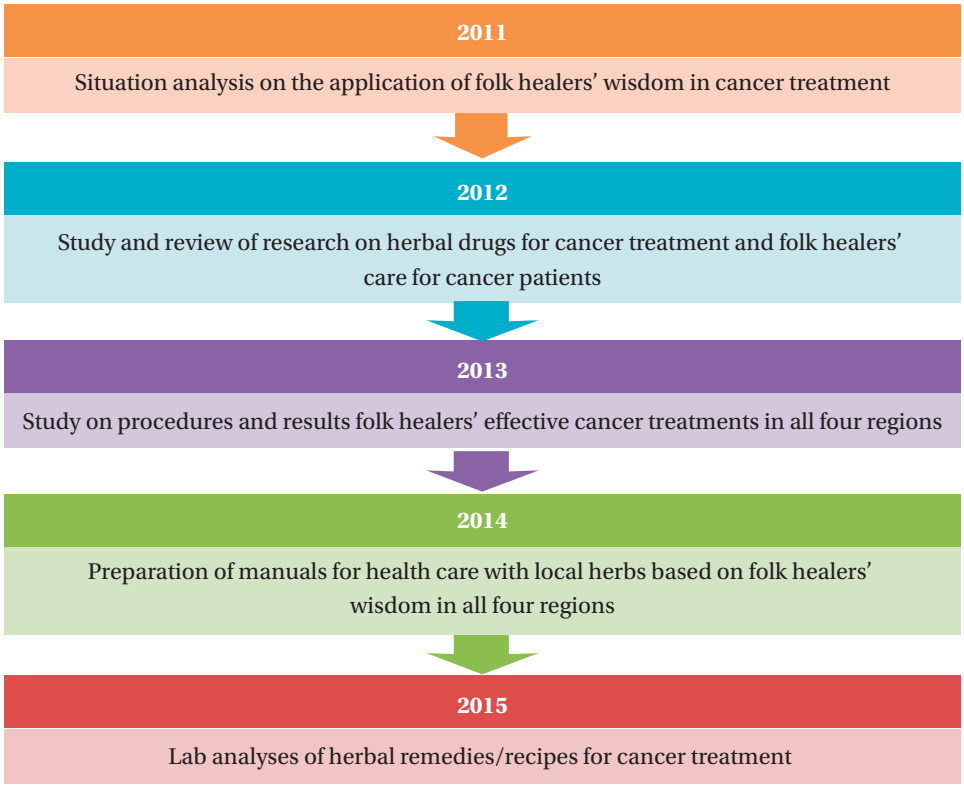
Cancer is Thailand's leading cause of death. More than 56,058 people died of cancer between 2009 and 2013 and the number is on the rise. Five most common types of cancers among the Thai people are breast cancer, colon cancer, lung cancer, cervical cancer, and liver cancer. Cancer is one of the chronic diseases that take a long time to cure, affecting both the patients and their families. Nowadays, more people have cancers because of the changing environment and lifestyles. Cancer may be caused by internal factors such as genes, immune system, or nutrition, or it can be a result of external factors such as chemicals, toxins from fungi or meat, or chronic infections. The same type of cancer may be triggered by different causes because each community has a different environment. Exposure to several risk factors can increase the chance and the speed of getting cancers.

Cancers can be detected by several methods such as physical examination, laboratory test, pathological test of a biopsy specimen, and other scientific tests. The sooner it is found, the better the result of treatments which may include surgery, radiation, chemotherapy, hormone therapy, and combined methods. In Thailand, cancers are treated with modern medicine as well as Thai traditional, alternative, and indigenous medicine.

Thus, most cancer patients seek alternative treatments while being treated with modern medicine. Indigenous medicine is a choice for the people who have trust in folk healers. Faith and beliefs in each area differ according to the people who live there. However, the study of cancer treatment by folk healers in different regions of the country has found that the procedures are quite similar. The treatment is holistic with physical, mental, and social care.

Folk healers primarily use herbal and spiritual/ritual remedies for cancer treatment, and advise patients to take up meditation. The factors affecting the treatment outcomes are the type and stage of cancer, the continuity of treatment, the patient's behaviours, and other obstacles that occur during the treatment. With that in mind, the Bureau of Thai Indigenous Medicine has drawn up a five-year strategic plan with the following details:

Diagram 4.9 Five-year strategic plan for cancer treatment with indigenous medicine (2011–2015)



The Bureau of Thai Indigenous Medicine started its research on the application of local wisdom on cancer treatment in all four regions of the country to determine the number of folk healers who treat cancer. This includes the body of knowledge on cancer diagnosis, cancer treatment procedures, post-treatment evaluation, and treatment methods. This is primary data for the appropriate application of folk healers' knowledge on cancer treatment. The findings indicated that there were 708 folk healers who treated cancers, of whom 228 had cancer remedies and 149 were still practicing. Today, the Bureau has been able to contact 57 folk healers who are currently treating cancers; 28 of them see more than 10 cancer patients. The 28 healers possess 51 herbal remedies that can and cannot be revealed. However, a preliminary analysis of the remedies found 147 plant parts, 2 animal parts, and 8 minerals. Among the plant parts, the top five commonly used herbs are (in descending order) smilax or *khao-yen-nuea* (*Smilax china* L.),

smilax or *khao-yen-tai* (*Smilax glabra* Roxb.), *non-tai-yahk* (*Stemona collinsiae* Craib), *kamphaeng-jed-chan* (*Salacia chinensis* L.), and *hua-roi-roo* (*Hydnophytum formicarum* Jack).

The study confirms that folk healers in all four different parts of Thailand have similar treatment methods. The only differences lie in the local culture and tradition. Most of the healers (91.2%) use herbal remedies. Plant-based materials, animal-based materials and minerals are used for balancing the body elements, curing cancer, boosting the immune system, and increasing vigor. They help alleviate the pain from cancers and increase the patients' quality of life according to the WHO's quality of life criteria in physical and psychological domains as well as social relationships and the environment.

The herbs used for cancer treatment by folk healers can be classified into three groups:

1. Herbs for cancer treatment. These are herbs that are antitoxins and can kill pathogens, fish, and insects such as *ya-nu-ton* (*Dianella ensifolia* (L.) DC.), *chingchee* (*Capparis micracantha* DC.), *ka-meng* (*Eclipta prostrata* (L.) L.), *thongphanchang* (*Rhinacanthus nasutus* (L.) Kurz).

2. Herbs for the care and recovery of cancer patients. These help alleviate the symptoms suffered by patients with cancer in spreading stage such as nausea, vomiting, pale complexion, and depression.

2.1 Herbs for symptom alleviation. The herbs known to reduce pain, fever, and stress are, for example, Thai copper pod or *khi-lek* (*Senna siamea* (Lam.) H.S.Irwin & Barneby), *fai-duean-ha* (*Asclepias curassavica* L.), and *kra-thing* (*Calophyllum inophyllum* L.)

2.2 Herbs for boosting the immune system. The herbs known to be tonic, analeptic or elixir include, for example, *jik* or *kradone* (*Careya arborea* Roxb.), wild bitter gourd or *mara-khi-nok* (*Momordica charantia* L.) and *luk-tai-bai* (*Phyllanthus amarus* Schumach. & Thonn.).

3. Herbs for cancer prevention (using food for disease prevention). This is the prevention of cancer by eating vegetables and fruits with high nutritional values and substances that can prevent and reduce cancer risks. This is part of the local wisdom passed on from their ancestors. Cancer is a non-communicable

disease (NCD) with the highest number of deaths, but the prevention and reduction of its risks is possible because it is caused by one's own behaviours.

The Bureau of Thai Indigenous Medicine has published manuals on the use of indigenous herbs based on the knowledge of folk healers from all four regions of Thailand. The manuals feature the use of each herb, its medicinal properties as well as precautions. Food recipes, treatment remedies, and the use of mushroom for health care are also published. The Bureau's publications for the people include the books on how to use *local herbs for preventing NCDs such as cancer, diabetes, and cardiovascular disease.*

The review of research studies on folk healers' wisdom for cancer treatment has shown that more empirical data from scientific analysis of herbal remedies both in pre-clinical and clinical experiments are needed to confirm their properties as well as toxicity, pharmacology, and the effect of the active ingredients. This is to ensure that the remedies meet the standards and are acceptable to health personnel and modern medical practitioners.



Photo: Local herbs for health series (Manuals of people's health care with local herbs)

Thus, the Bureau of Thai Indigenous Medicine started a selection scheme to find effective herbal remedies for cancer. The remedies were then analyzed for their chemical properties, toxicity level, pharmacological effects, effectiveness in halting the spread of cancer cells and antioxidant activity. Initial efforts were placed on 51 herbal remedies from 28 local healers across the country, each with more than 10 cancer patients seeking continuous treatment. The herbal remedies selected had to meet the following criteria:

(1) Being remedies for treating the type of cancer that occurs most often.

(2) The herbs contained in the remedies must be those that are easily available and non-toxic; and the number of such herbs must not be too high.

Based on the herbal remedy selection criteria mentioned above, four herbal recipes of four folk healers were selected. Their details are shown below:

(1) Herbal remedy for breast cancer by Moh Somyot Suriyachai, a Chumphon-based folk healer – Moh Somyot learned about the treatment and the remedy for breast cancer from Luang Pho Bao (a senior Buddhist monk) while he was a monk at Wat Choeng Kra in Mueang district, Chumphon province. The remedy can cure venereal diseases, neck lumps (abscesses around the neck, or *fi-pra-kham-roi*), carbuncle (*fi-fak-bua*), and *fi-hin* abscess. It can also help nourish weak and underweight women. He began providing cancer treatment when he was a monk. After leaving the monkhood, he took a course on Thai traditional pharmacy at Wat Pho (in Bangkok) and was granted a licence to practice Thai traditional pharmacy (Type A).

Moh Somyot's breast cancer remedy consists of 10 herbal plants such as Siamese senna or *khi-lek* (*Senna siamea* (Lam.) H.S.Irwin & Barneby), *hua-roi-roo* (*Hydnophytum formicarum* Jack). *kamphaeng-jed-chan* (*Salacia chinensis* L.), and *ya-nu-ton* (*Dianella ensifolia* (L.) DC.).

(2) Herbal remedy for colon cancer by Moh Soi Petcharit, a Nakhon Phanom-based folk healer – Moh Soi learned how to prepare herbal remedy from his grandfather ever since he was a child. He joined the Communist Party and spent some time in China where he studied traditional Chinese medicine including diagnosis, treatment of diseases, and preparation of remedies. His treatment is based on the combination of Thai local wisdom and traditional Chinese medicine.

Moh Soi's colon cancer remedy consists of 10 herbs such as smilax or *khao-yen-nuea* (*Smilax china* L.), *pha-niang-had* or *ma-duk* (*Siphonodon celastrineus* Griff.), *chingchee* (*Capparis micracantha* DC.), *nahm-khong* or *ta-khrong* (*Ziziphus cambodiana* Pierre), and *fakkhao* (*Momordica cochinchinensis* (Lour.) Spreng.).

(3) Herbal remedy for lung cancer by Moh Warakom Kaewpikun, a Si Sa Ket-based folk healer – Moh Warakom carried on the knowledge on herbal remedies from his grandfather who was a monk at Wat Prang Ku in Si Sa Ket

province. He studied traditional Chinese medicine at a Chinese military school in China for two years. Later he joined the monkhood and stayed at a temple in Cambodia for eight years before coming back to Thailand. He has been practising the healing arts since he was a monk. His specialties include cancer, arthritis, and diabetes treatments.

His remedies, inherited from the supreme patriarch of Cambodia, consist of nine herbs such as *hang-lai-daeng*, (*Derris elliptica* (Wall.) Benth.), *lam-phu* (*Sonneratia caseolaris* (L.) Engl.), *jik* (*Careya arborea* Roxb.), *kamphaeng-jed-chan* (*Salacia chinensis* L.), and smilax or *khao-yen-nuea* (*Smilax china* L.).

(4) Herbal remedy for liver cancer by Moh Chalee Khwanmueang, a Phrae-based folk healer – Moh Chalee inherited the knowledge of herbs and spells from a senior monk, Phra Khru Vejworakun, and has been treating patients since he was 21 years old. As a licensed Thai traditional pharmacist (Part A), he has also been manufacturing and dispensing traditional drugs to patients.

Moh Chalee's four steps of cancer treatment are:

1. Removal of toxins from the body with 20 types of ground herbs from plants and animals.

2. Equilibration of the body's elements using a herbal remedy composed of such herbs as *di-pli* (*Piper retrofractum* Vahl), *cha-phlu* (*Piper sarmentosum* Roxb.), *jettamunphloeng-daeng* (*Plumbago indica* L.).

3. Treatment of liver cancer with a remedy composed of 32 herbs such as *kamphaeng-jed-chan* (*Salacia chinensis* L.)*, chingchee* (*Capparis micracantha* DC.), smilax or *khao-yen-nuea* (*Smilax china* L.)*, and* smilax or *khao-yen-tai* (*Smilax glabra* Roxb.).

4. Psychotherapy to lift the patient's spirit and confidence by predicting the cause of cancer, based on the patient's month of birth.

Later, the committee and relevant experts selected one of the above remedies for lab analysis. The remedy with the highest evaluation score is the breast cancer herbal remedy which consists of 10 herbs such as Siamese senna or *khi-lek* (*Senna siamea* (Lam.) H.S.Irwin & Barneby), *hua-roi-roo* (*Hydnophytum formicarum* Jack). *kamphaeng-jed-chan* (*Salacia chinensis* L.), and *ya-nu-ton*

(*Dianella ensifolia* (L.) DC.). The remedy has been registered under the 1999 TTM Knowledge Protection Act.

In the lab analysis, the Bureau of Thai Indigenous Medicine collaborated with Thammasat University (Rangsit Campus), one of the leading academic institutions in Thailand. It is hoped that the remedy will be developed into a herbal remedy for cancer patients in Thai medical and health system in the future, increasing their choices of treatment, and improving their quality of life.

Future developments in summary:

1. Prepare a manual on holistic care for cancer patients. The manual should feature the use of indigenous herbs to improve patient's physical and mental health. The aim is to gain trust and acceptance from health personnel and modern medical practitioners.

2. Develop criteria for the evaluation of cancer patients who have been treated with both modern and alternative medicine. With the integrative approach, it is difficult to evaluate the treatment outcomes.

3. Conserve and carry on the treatment process for cancer as well as the remedy preparation of folk healers. The practice should also be used in the preparation of herbal remedy for laboratory analyses.

4.3.8 Indigenous medical wisdom in health care for the elderly

Thailand has seen an increase in ageing population over the past five decades. Since 2005, the country has become an "ageing society"; and it has been projected that it will become a "super-aged society" with the elderly making up 25% of the population by 2030. As their physical conditions deteriorate, they tend to be more dependent; and many of them are facing chronic diseases, living alone or having no one to care for them.

The top five illnesses commonly found in the elderly are: high blood pressure, endocrine/nutrition disorder, diabetes, anemia, and renal failure. Other health problems include urinary incontinence, accident, knee osteoarthritis, osteoporosis, dementia, stroke (paresis/paralysis), depression, constipation, cataract, and hearing impairment. According to the 2012 survey of the National Statistical

Office, there were 8.63 million elderly people in Thailand, or 12.7% of the population. The older population can be classified into three groups: 85.3% of them can take care of themselves, 13.8% partly need assistance, and 0.9% have to rely on help from others. The number of elderly persons in Thailand is on the rise, with the "oldest old" group aged 80 and over growing fast in terms of number and proportion, and the number of older people living alone or with only their spouse is also increasing.

Thailand has had an integrated policy and strategy in place for elderly care development since the 10th National Economic and Social Development Plan (2007–2011). This has continued into the 11th Plan (2012–2016). The aim is to empower the people and develop a system where all sectors can participate in developing a welfare society. The plan on elderly care development has four objectives: guaranteeing financial security, developing a welfare society, creating an environment suitable for the elderly, and developing a management mechanism. The 2nd National Plan on the Elderly (2002–2021) lays out the philosophy, visions, objectives, strategies, and measures for the elderly care work. There are structures and mechanisms for the work on the elderly at the national and local levels in all government, private, and non-profit organizations.

From 2013 to 2015, DTAM's Bureau of Thai Indigenous Medicine launched the "Project to Apply Indigenous Medicine in Providing Health Care for the Elderly". The project's objectives were (1) to encourage the learning of indigenous wisdom used in elderly health care, (2) to promote the application of indigenous knowledge in self-healthcare among elderly persons, and (3) to conserve local medical wisdom on health care. The three-year project also aimed to study and encourage the use of local health wisdom for elderly care through knowledge management, local context analysis, and plan execution and evaluation.

The project's work on learning and developing indigenous wisdom for elderly health care is two-tiered:

1. **Knowledge management on local wisdom for elderly health care –** The knowledge management process consisted of five important steps: (1) identifying issues and areas to be covered; (2) finding and capturing the knowledge needed; (3) creating and organizing "sets" of knowledge in a systematic and useable manner; (4) applying and transferring the knowledge to the organization or community;

and (5) evaluating the operations and synthesizing lessons learned. The project was implemented on a pilot scale in eight areas under *tambon* health promoting hospitals and one area under a community hospital in all five regions of Thailand, and covered four important areas:

1) Health service provision context: the study involved an overview of the situation including the number of elderly persons, their health status, local health service system for those who were sick or had a health problem, number of the elderly with good health, and home health care.

2) Social security for the elderly: the study reviewed the implementation of local elders clubs, welfare for club members, occupational promotion and income, and empowerment of the elderly and their families.

3) Local health wisdom: the study focused on two parts: part 1, daily health care used in the family such as food, herbs, or exercise and part 2, local wisdom practised by folk healers for treating illnesses, especially the knowledge, process and healing procedures.

4) Community knowledge asset: the study put together a list of folk healers, local scholars, model senior citizens, and the transfer of knowledge or wisdom from such people to the next generation.

Concerning the knowledge management in the aforementioned issues, the concept of health care and health promotion for the elderly in the study areas involves health promotion, disease prevention, disease treatment, and rehabilitation. The older persons can be divided into three groups: healthy elders, home-bound elders, and bed-bound (bedridden) elders. Government agencies have provided health care for all of these groups and they are prepared to help the elderly stay healthy physically, mentally, and socially. There is an "Elderly Club" or "Elders Club" in every area. This is an important mechanism for the work with the government for the elderly. The three priority work areas are providing welfare for the elderly, providing jobs and income, and enhancing elders' capacity.

For the daily health care at older persons' homes, it has been found that some of the elderly have chronic illnesses but they are able to keep them under control. These elders have a good health-care plan. They eat the right food, mainly fish and vegetables. Research has confirmed that local vegetables and local foods

contain antioxidants that can slow down the ageing process and prevent chronic diseases.

Their exercises include walking, arm swinging, doing yoga, practising *tai chi*, swimming, joining traditional dance or ballroom dance, and stretching exercises. In some areas such as Phitsanulok, chronic patients exercise by doing traditional *Ram Wong* dance, which can make them healthy, physically and mentally. Sometimes the elderly come up with new exercise positions, imitating the moves in their daily life or animals' postures. The elderly group in Kalasin's Thung Khlong subdistrict introduced the "eel-poking move" exercise, while another group in Phitsanulok's Sa Khlo subdistrict introduced the "egret posture dance".

Elderly people use herbal medicines such as *ya-hom* herbal powder to cure dizziness and fatigue, common conditions found in such age group. The remedies are local. Some are indigenous remedies while some are Thai traditional medical formulas. They also have "elixir" remedies such as *Tri-phala* remedy, banana and sticky rice, vegetables or fruits (kaffir lime, garlic, or *bo-ra-phet* preserved in honey.

Indigenous medical wisdom for elderly care varies in different areas and so do the common illnesses, including muscle pain, dizziness, constipation, menopause symptoms, diabetes, paresis/paralysis, and high blood pressure. The folk healers use herbal medicines – single herb remedies and multiple herb ingredients for relieving

หมอสง่า พันธ์สายศรี ตำรับยาแก้ปวดเข่าในผู้สูงอายุ



Photo: Moh Sa-nga Pansaisri and his knee-pain remedy

bone, joint and muscle pain. Some of them have a herbal paste recipe for healing knee pain in the elderly, or they may use single herb and recipe drugs for muscle pain such as *thaowanpriang*, *phlai*, ginger or *ko-klan* herbal recipe. Some may give massage to cure knee osteoarthritis for the elderly. For dizziness or fainting, *ya-hom* remedy usually containing more than 20 types of herbs can be used. Besides, the healers have their own "elixir" which they believe can increase appetite, regulate bowel movement, and ensure a good night's sleep. If these conditions are normal, older persons will be happy and have a long life. The elixirs containing multiple ingredients are formulated recipes such as *Tri-phala* recipe and *ya-dong-ma-krud* recipe.

2. Promotion and utilization of indigenous medical wisdom for elderly health care

According to the lessons learned, folk healers have been practising for a long time. In 2014, a DTAM's survey showed that there were 55,475 folk hears (as of 31 January 2015) serving as herbalists, massage therapists, traditional birth attendants (TBAs, or *moh tam-yae*), and ritual or magic healers in treating both physical and mental illnesses. In the near future, DTAM has set out policies and guidelines to recognize the legal and social status of the folk healers. Currently, they work in three ways: (1) home-based practice at their own homes, (2) community-based practice together with the community or local entity offering treatment in a designated area, and (3) integrative practice at a primary care unit in the locality.

There are four stages in the support for and utilization of indigenous health wisdom on elderly care. (1) Learn about the knowledge of health care in the local area and build rapport with all relevant partners. (2) Encourage the getting together of folk healers and promote their capacity. (3) Improve their roles and services in the community or give them an opportunity to provide elderly care services together with state health-care facilities. (4) Evaluate and conclude lessons learned about indigenous health care. However, in order to succeed, it also requires the acceptance by the local community and the support from the government in terms of resources and technical assistance.

The results of the three-year study on indigenous medical wisdom for elderly health care (2013–2015) have led to the preparation a manual for elderly health care with indigenous medical/health wisdom. The manual is intended for use by health personnel working at *tambon* (subdistrict) health promoting hospitals as well as community hospitals.

Conclusion

Elderly health care should adopt an integrated and long-term approach involving indigenous health wisdom which is valuable. Communities and the private sector should also join the government in learning, managing, and encouraging the use of the wisdom. It has been found that the knowledge of local herbs/foods, local music/dance, mental religious support, massage, and herbal medicines for health care is worth exploring and managing. This cultural-based knowledge deserves further development so that it can be used in ensuring both good health and longevity for the elderly.

4.4 Knowledge management and research on indigenous medicine: lessons on procedures and methodology

Indigenous or folk medicine is a popular sector medical system that exists harmoniously with the local culture. Some of the practices are different, depending on their geographical region, religion, and ethnic group. The wisdom has been passed down and used within the community. The local medical and health knowledge system is embedded and crystallized through the folk healers' experiences, empirically and mystically. Folk medical wisdom is thus unique to each community amidst the diversity of local health wisdom.

4.4.1 Management of indigenous medical knowledge for health system – The objective is to generate knowledge for easy access and utilization. The knowledge management and lessons learned can be summarized into three aspects: basic concepts, procedures and results.

1) Knowledge management basic concepts:

1.1) The understanding that the world was not built on one set of knowledge, but various knowledge bases have generated positive developments for every generation. Similarly, there are other health and health-care knowledge bases that have been used by humans, besides modern medicine, the mainstream medical system in Thai society.

1.2) Each type of knowledge is unique in its nature. Knowledge is beyond what is read or heard. Tacit knowledge exists in cultures or skills.

1.3) It is important to understand the existence of knowledge, how to document, organize, and utilize such knowledge, and how to build on that knowledge.

1.4) How to set up its working system or management mechanism.

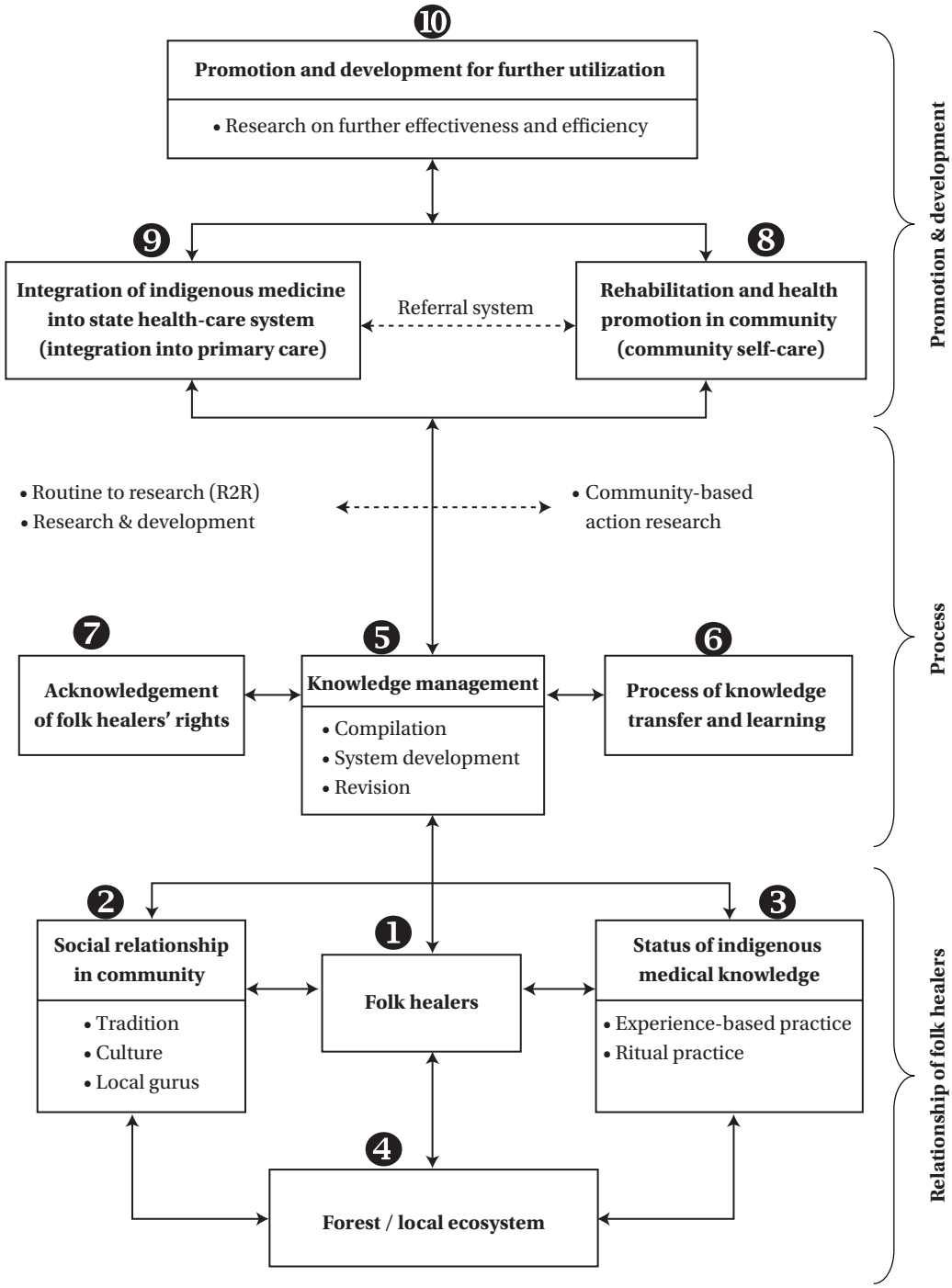
1.5) The cultural dimension of the health and medical system. Clear and practical questions about 3 major issues and 10 sub-issues are to be formulated to link up different bodies of indigenous medical knowledge for effective and thorough development and utilization in the health system, see Diagram 4.10.

2) Knowledge management process – The identification or selection of the knowledge base is also important.

2.1) The selection or identification of indigenous medical knowledge has two purposes: (a) policy development (6 issues) and (b) knowledge management and research on body of knowledge (8 issues). For policy development, its aim is to facilitate the work on indigenous medicine, while the research and knowledge management is based on the role and potential of indigenous medical practitioners as well as health problems. For example, community health care with local wisdom involves the use of local herbs and local food through community learning centres and folk healers' clubs. In dealing with long-term chronic care in the community, indigenous healers can play a part on the Family Care Team in the integrated indigenous and modern primary medical care system.

2.2) The knowledge management process, including major actions as shown in Diagram 4.0.

Diagram 4.10 Relationships of indigenous medical wisdom/knowledge



The diagram above shows three relationships of indigenous medical wisdom as follows:

1) Relationships of folk healers in terms of features and nature of indigenous medical knowledge: ❶ Folk healers have knowledge and experience in the community context; ❷ Social network includes various local scholars in the cultural, traditional, and ecological context; ❸ The status of indigenous medicine can be classified into secular sub-sector and sacred sub-sector. This relationship gives a unique identity to indigenous medicine. It includes both experiential and tacit knowledge embedded in the people, traditions, and culture. Qualitative research, thus, is the key to knowledge management in indigenous medicine with the help of multiple perspectives and quantitative study.

2) Knowledge management process – including: ❺ collection, organization, and revision of knowledge; ❻ system for the transfer of knowledge or learning; ❼ certification of folk healers' rights. A system has been designed for indigenous medical research in line with operational efforts such as measuring the capacity of folk healers in stroke (paresis/paralysis) patient care; involving learners and knowledge recorder, the media and TTM practitioners/researchers; certifying folk healers' rights. The entire process includes policy advocacy, working model development, and revision or enactment of laws and regulations.

Knowledge management regarding promotion and development of indigenous or local herbs and food – including: ❽ restoring and encouraging community self-healthcare through community-based action research, the empowerment of folk healers and partners to become lead researchers, getting work facilitated by academics, developing teamwork members and local folk healers, and searching for and compiling knowledge in their own community for use and transfer purposes; ❾ integrating indigenous medicine into the state primary care system; for seven health issues, the knowledge management process is carried out through research in three aspects: (a) research and development, (b) clinical research on broken bone treatment by folk healers, and (c) routine to research (R2R), which is a very popular method especially among health-care providers as they are encouraged to ask questions regarding a problem encountered in their work and then design solutions to such problems; and ❿ encouraging the use of the knowledge and support further research on the subject – the breast cancer remedy

of a Chumphon-based folk healer is chosen for further study in the laboratory of Thammasat University's Institute of Pharmaceutical Product Research.

3) Results from knowledge management efforts

(1) Innovation in clinical research methodology: the development of tools and assessment methods in 14 bone fracture patients by indigenous bone healers with the advice from orthopedic experts and research networks in 9 provinces.

(2) Six handbooks for advocacy work on indigenous medicine policy, for example, a manual for certifying folk healers' status, developing laws and regulations, assessment criteria for certification of folk healers, fostering cooperation with academic institutions in managing indigenous knowledge, and developing Thai traditional medicine learning centres.

(3) Sets of knowledge of "indigenous medicine" derived from eight research and knowledge management projects, including eight handbooks on the practice guidelines for health workers and eight people's handbooks on how to care for themselves with local herbs and vegetables.

(4) Electronic database of knowledge from 4,000 indigenous healers under the project on Thai Traditional Digital Knowledge (TTDK).

4.4.2 Important lessons learned and recommendations

(1) In designing participatory action research studies such as community-based action research, research and development, clinical research, and routine-to-research projects, all such actions facilitate the learning process among members of the research team, multidisciplinary team, and folk healers. The team members have had direct experiences while learning from one another. In many cases, the effort continues even after the end of the research. Some *tambon* health promotion hospitals in Surin and Phattalung provinces continue offering postpartum care for women by folk healers.

(2) Indigenous healers are "proud" to be accepted by the health workers and the certification makes them feel that they are not "quacks" or illegal healers.

(3) Cooperation between health workers and folk healers in providing care to community members is achieved.

4.5 Collaborative Network of Indigenous Medicine in the Greater Mekong Subregion (GMS): International Cooperation

The Mekong is the longest river in Southeast Asia. It is the 12th longest river in the world with an approximate length of 4,800 kilometres. The Mekong Basin, 21st biggest in the world, is separated into two parts. The upper part, the Lancang River, starts in China's Qinghai province while the lower part begins from Thailand's Chiang Saen district and flows down to the Mekong Delta in Vietnam. The Mekong runs through six countries (China, Myanmar, Laos, Thailand, Cambodia, and Vietnam) into the South China Sea. This Subregion is full of history and wisdom, especially knowledge of health care. The area is abundant in natural resources and different communities along the river are connected in terms of environmental, economic, and cultural identities.

4.5.1 Economic cooperation in the GMS: the priorities

Besides its natural resources, the GMS connects South Asia, East Asia, and Southeast Asia. The Subregion's economic cooperation has been underway since 1992 with the support of the Asian Development Bank. The project aims to increase the volume of trade and investment as well as provide support for the industrial, agricultural, and service sectors in order to create jobs and raise people's quality of life. The project also encourages technological and educational cooperation, and the sustainable use of natural resources. However, most of the 11 flagship programmes focus on the economy. The cooperation on human capital development in terms of public health in the past ten years has focused only on AIDS prevention and control. Thus, economy-led development clearly cannot guarantee people's wellness with balance and sustainability

4.5.2 GMS Indigenous Medicine Network: learning together to utilize and protect local wisdom

1) According to a report on plant biodiversity of Prof. Dr. Pei Shengii of the Kunming Institute of Botany, in the six GMS countries, there are 13,548 plant

species, including 6,157 species in Yunnan alone out of 11,145 in China, 155 in Cambodia (of an estimated 1,500–2,000 species, 322 in Myanmar (of an estimated 2,000–2,500 species), 1,500 species in Laos, 1,556 species in Thailand, and 3,948 species in Vietnam. The report has also identified four causes of the decrease in the number of China's plant species: (a) reduction in the forest areas; (b) more land use for agriculture; (c) population increase; and (d) higher demand for herbs in markets.

The situation has reflected the GMS's futile natural capital as well as threats, which are the common challenges for the network to find a solution or direction towards more sustainable use of such natural resources.

2) Over the past several years, Chiangrai Rajabhat University's College of Indigenous and Alternative Medicine, a pioneer in indigenous medicine work in the GMS, has set out strategies for research and development of community networks for herb development, including raw herbs and herbal products as well as training. The college has a herb garden and a learning centre that provides both information and indigenous/tribal medicine services. It also organizes a central forum for experience sharing among indigenous healers and publishes the Journal of Asian Ethno-Medicine.

(1) The Collaborative Network of Indigenous Medicine in the Greater Mekong Basin

(2) The Academic Committee of the Network

(3) The Core Committee on the Protection of Traditional Medicine Knowledge and Medicinal Genetic Resources

The first four meetings of the members of the GMS indigenous medicine network were coordinated by the college. The 5th and 6th meetings were joined by the Department of Thai Traditional and Alternative Medicine, Mahasarakham University, and Chao Phya Abhaibhubejhr Hospital. The 6th meeting held in Li Jiang of China's Yunnan province set up three committees:

(1) The Collaborative Network of Indigenous Medicine in the Greater Mekong Basin

(2) The Academic Committee of the Network

(3) The Core Committee on the Protection of Traditional Medicine Knowledge and Medicinal Genetic Resources

The three committees will be the working mechanisms for the six member countries and meet to determine policies for joint support and development of GMS indigenous medicine. Each committee has a different task.

Committee 1: determining directions and strategies

Committee 2: determining policies and encouraging technical development and research

Committee 3: determining policies and supporting the protection of indigenous medical wisdom and herbal varieties

4.5.3 Conclusion and recommendations

1) Drive the work through the network mechanism. The Collaborative Network of Indigenous Medicine in the Mekong Basin has formed three committees that work together in determining the direction of its work.

2) Strengthen the research network to jointly develop the Subregion through its knowledge base by the Academic Committee of the Network.

3) Empower the network in the protection of intellectual property rights (IPR) by the Core Committee on the Protection of Traditional Medicine Knowledge and Medicinal Genetic Resources. The establishment of the Digital Medicinal Plants Information System of the Mekong Basin should be a top priority in setting up a system for benefit sharing and IPR protection. This is to ensure the joint development of the GMS's indigenous medicine network based on the sustainable use of local wisdom and natural resources in the cultural context. This should bring about balanced economic development that will bring wellness to the people in the Subregion.

4.6 Epilogue

This chapter on the past decade revival of Thai indigenous medicine for sustainable community health care is a set of experiential knowledge that portrays many dimensions of the indigenous medical system. The Department of Thai Traditional and Complementary Medicine, playing the role of a technical and policy development agency, and its partners have been propelling this development

effort. The four major elements of experiential lessons learned include: (1) policy development; (2) knowledge management and research: the studies and compilation of experience-based indigenous medical knowledge; (3) knowledge management and research: the process and procedures; and (4) indigenous medicine network in six countries of the Greater Mekong Subregion: international collaboration to drive for success and epilogue.

Experience-based knowledge, the important lessons learned:

1. Indigenous medicine revival process can be somewhat difficult to understand. However, after the joint development effort is finished, lessons have been learned from the knowledge management process of each issue, especially in the integration of indigenous medicine into the state health-care system. The integration itself is a continuous working process through collaborative research and studies, for example, on maternal and neonatal health care and snakebite treatment (integrative medical care by modern medical doctors, TTM doctors and folk healers at community hospitals).

2. Application of methodology in knowledge management – the start of the working process. Most of the methods used are as follows:

2.1 Community-based action research on local wisdom for enabling the community to learn while conducting research and play a key role in the research undertaking.

2.2 Research and development.

2.3 Routine-to-research (R2R) approach especially at the beginning of the working process which aims to improve practical procedures and motivate staff to work and learn more efficiently.

2.4 Clinical research – to be detailed later.

3. Methodological innovation – a case study of bone fracture treatment by folk healers. A clinical research team, led by an orthopaedic expert from a university, together with local researchers (medical doctors and health personnel of state health-care facilities) and folk healers looked into the application of folk healer's bone-setting tools, modern medicine principles, and evaluation of the folk healing method. As a result, modern physicians have learned about the bone setting capacity of folk healers and are interested to learn more about it, such as how to

use folk healer's bamboo splints and how to apply the knowledge management principles.

4. Paradigm shift of health professionals including health-care personnel in the modern health-care system towards folk healers. An example is snakebite treatment at community hospitals resulting in a referral system between folk healers in the community and nearby hospitals.

5. Integration of folk healing into modern health-care services in many aspects. An example is getting folk healers to take part in providing curative care at community hospitals and *tambon* health promoting hospitals.

6. Certification of folk healers which enables them to practise with confidence and dignity under the Thai health-care system. It also opens many doors for improvement and further collaboration in community health care.

7. Folk healers' herbal medicine formulas vary in each community and have been widely used for a long time. Some formulas have been adopted for use in state health-care facilities. For example, the use of lactation-stimulating herbal formulas (*pra-sa-nam-nom*), and the cases in Dong Kheng subdistrict in Khon Kaen province, Dan Sai district in Loei province, and Nakhon Phanom province.

8. Laws and regulations have been enacted or amended in order to promote Thai indigenous medicine which has to be developed in parallel with other aspects as appropriate in order to be successful.

The lessons learned from all the eight issues mentioned above may not be the most complete in all aspects but they have helped propel the development of Thai indigenous medicine. It has opened doors and widened the perspective of the practice of folk healers, as well as their potential and importance, in the Thai health-care system that MoPH's Department of Thai Traditional and Alternative Medicine along with related partners aims to develop for future use.

Chapter

5

Situation of Thai Traditional Medical Knowledge Protection in Thailand

The move for the protection of Thai traditional medical (TTM) knowledge or wisdom is the transformation of the policy on TTM wisdom protection and promotion into action in a concrete manner. Since the enactment of the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, the Department of Thai Traditional and Alternative Medicine (DTAM, formerly known as Department for Development of Thai Traditional and Alternative Medicine), has been the lead agency in the conservation, protection and monitoring of TTM wisdom, herbs or medicinal plants, and their origins or habitats at the local, national and international levels. Such actions are undertaken according to the 1999 TTM Knowledge Protection Act and in line with local and international laws, agreements, rules and regulations, for example: (1) the World Intellectual Property Organization, or WIPO, and meetings of the World Intellectual Property Organization Intergovernmental Committee, WIPO IGC, on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore; (2) the Conventional on Biological Diversity, CBD; (3) the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity; and (4) the Convention for the Safeguarding of the Intangible Cultural

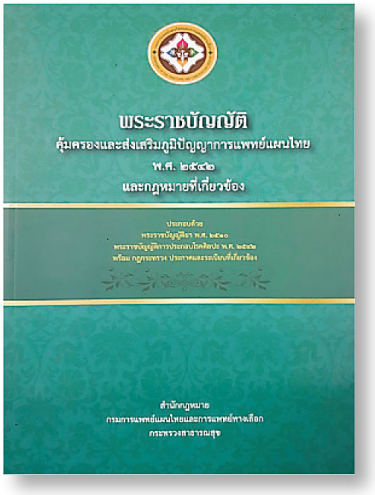
Heritage, the Convention on International Trade in Endangered Species (CITES), and Thailand's Plant Varieties Protection Act B.E. 2542 (1999).

According to the Conventional on Biological Diversity, article 8j, indigenous or local knowledge or wisdom means the knowledge, innovations and practices of indigenous and local people or communities.

According to WIPO IGC documents, traditional knowledge is a living body of knowledge passed on from generation to generation within a community; it often forms part of a people's cultural identity, including the body of knowledge, practices, skills and innovations. (Note: At present, the term "local wisdom or knowledge" has not been clearly defined and accepted internationally.)

The World Health Organization (WHO) has referred to "traditional medicine" as health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being.

For Thailand, the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, published in the Government Gazette, Vol. 116, part 120, dated 29 November 1999, coming into force on 27 May 2000, is regarded as a specific law (*sui generis*) or a tool for TTM knowledge protection in Thailand. In line with other laws in the country, the intent of the Act is to protect herbs, TTM recipes/formulas, TTM textbooks, and herb origins or habitats; and it contains 7 chapters and 82 sections. The definitions of Thai traditional medicine and other relevant terms are prescribed in Section 3 as follows.



"Thai traditional medical (TTM) knowledge" means fundamental knowledge and capability in Thai traditional medicine;

"Thai traditional medicine (TTM)" means a medical procedure in relation to examination, diagnosis, therapy, treatment or prevention of disease

or promotion and rehabilitation of human or animal health, midwifery and Thai traditional massage, including preparation of Thai traditional drugs and invention of a medical device and tool upon knowledge or treatise which has been conveyed and developed continually;

"Treatise on Thai traditional medicine (or TTM textbook)" means any technical knowledge in relation to Thai traditional medicine that has been written or recorded on Thai book, palm-leaf book, stone inscription or other materials, or that has not been recorded, but it has been learned or conveyed continually by any means;

"Thai traditional medicine (Thai drug)" means drug obtained directly from herb or by mixing, blending or transforming of herbs, including folk medicine under the law on drugs;

"Recipe of Thai traditional medicine (or TTM formula)" means a formula that specifies production processes and compounds of medicine whereby Thai traditional medicine, irrespective of its form, is one of the compounds;

"Herb" means a plant, animal, microorganism, substance, original extract of plant or animal to be used, transformed, mixed or compounded as drug or food for examination, diagnosis, therapy, treatment or prevention of disease or for intensification of human or animal health, including the origin or habitat thereof;

"Controlled herb" means herb as notified by the Minister as the controlled herb;

"Conservation area" means national reserved forest, environmental protection area, wildlife sanctuary, hunting prohibition area, national park and other protected areas designated for reservation and preservation of natural conditions as prescribed by law;

"Successor of a recipe of Thai traditional medicine or a treatise on Thai traditional medicine" means a person to whom a recipe of Thai traditional medicine or a treatise on Thai traditional medicine has been conveyed from the searcher, enhancer or developer thereof, or a person who has learned such recipe or treatise without knowing of the original searcher, enhancer or developer thereof, or a person who has received such recipe or treatise from other persons;

"Holder of right" means a person who has registered his right in Thai traditional medical knowledge under this Act;

"Committee" means the Protection and Promotion of Thai Traditional Medical Knowledge Committee;

"Registrar" means the Central Registrar or the Provincial Registrar, as the case may be;

The compilation of data or information about local wisdom/knowledge for the registration and protection of biodiversity and local wisdom according to various laws, and the database development of such wisdom for further commercial use has been undertaken using the following mechanisms: (1) promoting and supporting the conservation of biodiversity and wisdom of the community and locality; (2) collecting and preparing lists of plants, animals, and microorganisms, whose origins are in the country, or which can be found in the country, including local wisdom, for use as a database for economic purposes from such local biodiversity and wisdom; (3) promoting, supporting and implementing the dissemination of knowledge as well as the access and utilization of local biodiversity and wisdom; and (4) promoting, supporting and implementing the registration and protection of local biodiversity and wisdom according to relevant laws. At present, the Biodiversity-Based Economy Development Office has set up a Committee on Selection of Local Wisdom or Traditional Wisdom or Thai Wisdom of various branches, which have been classified and shown in Table 5.1

Table 5.1 Classification of local, traditional or Thai wisdom of various branches by responsible agency

Responsible agency	Local, traditional or Thai wisdom of various branches
Department of Thai Traditional and Alternative Medicine	1. National Thai traditional medicine wisdom 2. General Thai traditional medicine wisdom 3. Personal Thai traditional medicine wisdom
Department of Intellectual Property	1. Traditional knowledge 2. Expression of folklore
Department of Cultural Promotion	Registration of intangible cultural heritage in seven branches: 1. Language 2. Local literature 3. Performance arts 4. Social, ritual and festival practices 5. Traditional skilled craftsmanship 6. Knowledge and practices related to nature and cosmos 7. Thai sports wisdom
Department of Fine Arts	Expression of folk arts and culture in dramatic works and artistic works
Biodiversity-Based Economy Development Office	1. Agricultural wisdom 2. Food wisdom 3. Thai traditional medicine wisdom and herbs 4. Handicraft wisdom 5. Wisdom of biodiversity resources management
Department of Community Development	Collection of Thai subdistrict (*tambon*) wisdom 1. Food 2. Drinks 3. Textile and clothing 4. Commodities, decorative items and souvenirs 5. Non-food herbs 6. Others

Source: Biodiversity-Based Economy Development Office (2014).

As shown in Table 5.1, the grouping of local wisdom/knowledge or biodiversity varies according to their utilization and related laws as well as the conservation context. So there should be a national agency to undertake the wisdom collection and policy management under the government's mechanism for the purpose of wisdom protection, conservation and utilization as appropriate in a sustainable manner.

This chapter deals with the movement and implementation of TTM wisdom protection system and mechanism in various aspects during 2013–2016 as follows:

5.1 System development and operational mechanism

5.1.1 Between 1999 and 2012, 19 secondary laws under the 1999 TTM Knowledge Protection Act, including 5 ministerial rules, 10 ministerial notifications, and 2 regulations and 2 announcements of the TTM Wisdom Protection and Promotion Committee were issued; but no other secondary laws were passed during 2013–2016.

5.1.2 Selection of qualified or expert members of the TTM Wisdom Protection and Promotion Committee according to the ministerial rule on criteria and procedures for selecting qualified or expert members of 2003. Seven selections were held – the fifth, sixth and seventh ones during the periods 2012–13, 2014–16 and 2017–18 respectively.

As required under clause 4 of the ministerial rule, the Central Registrar and the Provincial Registrars have prepared personal information of various expert groups for use in the selection of expert committee members; the cumulative numbers of experts between 2005 and 2016 are shown in Table 5.2.

Table 5.2 Registry or numbers of expert groups with personal information for use in the selection of expert committee members, 2005–2016

Health region	Folk healers	Organizations	Herb growers or processors	Herb producers or sellers	Academics	Total
1	7,363	67	400	330	272	8,432
2	2,916	32	107	87	148	3,290
3	1,908	44	130	112	123	2,317
4	1,603	61	170	147	203	2,204
5	2,094	104	251	226	198	2,873
6	2,353	66	255	176	162	3,012
7	9,493	25	171	90	110	9,889
8	8,553	44	369	159	125	9,250
9	4,804	29	274	63	173	5,343
10	10,034	40	391	126	353	10,944
11	3,039	38	264	194	155	3,690
12	3,549	81	222	130	239	4,221
13	102	8	31	105	42	288
Total	**57,831**	**639**	**3,035**	**1,945**	**2,303**	**65,753**

Source: Central Registrar's Office, 31 July 2016.

5.1.3 Development of the systems and mechanisms for TTM wisdom conservation, protection and promotion by designating 4 missions as per the powers and duties of the TTM Wisdom Protection and Promotion Committee, namely (1) TTM protection, (2) legal affairs, (3) support for the TTM wisdom protection, and (4) indigenous medicine.

5.2 Conservation and protection operations under the Act

The DTAM is responsible for collecting the information about TTM wisdom, especially Thai drug formulas and TTM textbooks or manuscripts from all over the country for creating a registry of TTM wisdom. To date 167,712 TTM wisdom items have been recorded in the registry, of which 159,745 are Thai drug formulas and 7,967 are TTM textbooks (Central Registrar's database, 31 July 2016).

At present, the selection of Thai drug formulas and TTM textbooks is underway for further notification as national or general Thai drug formulas and national or general TTM textbooks. Also ongoing is the development of a computer programme and database for the registration of the right to personal TTM wisdom.

5.2.1 TTM wisdom, including Thai drug formulas and TTM textbooks, are protected at three levels:

1) TTM textbooks and Thai drug formulas that are useful and especially valuable for the medical or public health systems and regarded as national TTM wisdom.

Any person who wishes to (a) take a national Thai drug formula to (1) apply for drug formula registration and request permission for drug manufacturing as per the drug law or (2) undertake further research for improving or developing a new drug formula with a commercial purpose, or (b) take a national TTM textbook for improving or developing a new piece of TTM wisdom for commercial purpose, may apply for permission to use and pay fees and compensation for such use to the approving officer.

2) See sections 5.2.2 and 5.2.3.

The protection of certain Thai dug formulas in TTM textbooks is in accordance with the MoPH notification on designating national TTM textbooks and national Thai drug formulas, dated 31 July B.E. 2559 (2016), see Table 5.3.

Photo 5.1 Examples of TTM textbooks of which a registration is being requested



Table 5.3 Notification designating national TTM textbooks and national Thai drug formulas

Order	TTM textbook title	No. of textbooks	No. of pages	No. of drug formulas
Notification No. 1				
1	Marble Inscriptions of Wat Phra Chetuphon (Wat Pho)	1	380	1,061
Notification No. 2				
1	Khamphi Thart Phra Narai (palm-leaf)	1	33	79
2	Tamra Vejjasart Chabab Luang of King Rama V (Thai book)	33	-	1,999
3	Tamra Phra Osot, King Rama II	1	-	86
4	Tamra Ya, Prince Sai Sanitwongse, B.E. 2459 (1916) edition	1	-	20
5	Tamra Ya Phiset of Prince Krom Phraya Pawaret Wariyalongkorn (document B.E. 2461 (1918)	1	-	68
6	Textbook of Drug Properties, Prince Krom Luang Wongsadhiraj Snit, First edition, B.E. 2462 (1919)	1	-	-

Table 5.3 Notification designating national TTM textbooks and national Thai drug formulas (continue)

Order	TTM textbook title	No. of textbooks	No. of pages	No. of drug formulas
7	Samut Thai Dam: "Pictures of Ruesie Dutton for Healing Diseases, 80 Pictures"	1	-	-
8	Leach Therapy (Tamra Phaen Pling)	7	-	-
Total for No. 2		**46**	**33**	**2,252**
Notification No. 3				
1	Marble Inscriptions, Wat Ratcha-orasaram	1	50	186
Notification No. 4				
1	Drug Formulas and Thai Traditional Medicine Textbook	35	-	2,369
Notification No. 5				
1	Khamphi: Smallpox Treatment (Tamra Phaen Fidad)	19	-	2,372
Notification No. 6				
1	Drug Formulas and Thai Traditional Medicine Textbook	5	-	403
Notification No. 7				
1	Thai Traditional Medicine Textbook	4	-	-
Notification No. 8				
1	Tamra Ya Kred	29	-	1,841
Notification No. 9				
1	Tamra Ya Kred	14	-	1,641
Total for Nos. 1–9		**154**	**463**	**12,125**

Source: Department of Thai Traditional and Alternative Medicine, 31 July 2016.

As evidenced in the aforementioned notifications, Thailand has got a system for TTM wisdom protection of the nation, using laws as legal instruments. In this regard, any person wishing to take national TTM wisdom for commercial use, permission must be asked from the approving officer (MoPH's permanent secretary, or assigned person), according to Section 19 of the 1999 TTM Knowledge Protection Act.

5.2.2 TTM textbooks or Thai drug formulas that have been used widely are regarded as general TTM wisdom.

5.2.3 Personal TTM textbooks or Thai drug formulas

- The individual owner is the person who devised the Thai drug formulas or TTM textbooks

- The individual owner is the person who revised or developed the Thai drug formulas or TTM textbooks

- The individual owner is the person who inherited the Thai drug formulas or TTM textbooks

Any person who is a Thai citizen (of Thai nationality) and possesses the above qualifications has the right to take the TTM wisdom to get it registered.

The right to a Thai drug formula of the right-holder is valid throughout the life of the right-holder and for another 50 years as from the date of the right-holder's death. Between FYs 2013–2019 (as of 31 July 2016), there are 169 requests for registrations of the rights to personal TTM wisdom, see Table 5.4.

Photo 5.2 Books containing personal Thai drug formulas whose registration is being requested



Table 5.4 Number of requests for personal Thai drug formula registration, FYs 2013–2016

Description	2013	2014	2015	2016	Total
Thai drug formulas	2	75	36	42	155
TTM textbooks	1	4	4	5	14
Total	**3**	**79**	**40**	**47**	**169**

Source: Department of Thai Traditional and Alternative Medicine, 31 July 2016.

The working group on the study and screening of Thai drug formulas and TTM textbooks for notification as national or general Thai drug formulas and TTM textbooks had reviewed and indicated that 37 requests should be given the rights to such wisdom. The working group's announcements had been sent to relevant local government organizations until the certificates of rights to TTM wisdom was issued.

The utilization of TTM wisdom:

(1) Use as evidence for inspection and reference for Thailand

(2) Select for use in self-care in the community

(3) Use for translation, study/research, analysis, and development purposes

(4) Select as per the criteria for designating it as a national or general formula or textbook

5.2.4 Herbs

According to Section 3 (of the 1999 TTM Wisdom Protection Act), "herb" means a plant, animal, microorganism, substance, original extract of plant or animal to be used, transformed, mixed or compounded as drug or food for examination, diagnosis, therapy, treatment or prevention of disease or for the promotion of human or animal health, including the origin or habitat thereof.

The designation of the types, characteristics, species and names of the herbs that are valuable for study or research, or of economic importance, or probably extinct as "controlled herbs" is to be in accordance with the definition, criteria and properties of the three groups of herbs mentioned earlier. The Subcommittee on Herb Protection passed a resolution approving the criteria on 27 June 2016, see Table 5.5

Table 5.5 Criteria for reviewing/screening herbs that should be designated as controlled herbs

Type of herbs	Definition	Details
Herbs that are valuable for study or research	Herbs that should be taken for study or research, or further development for medical and health-care use, economic activities or livelihood.	1. Being herbs with high potential and importance for use in medical and health care. 1.1 There is information specified in documentary evidence or a TTM textbook that the herb can be used for healing an acute disease or symptom. 1.2 There is information specified in documentary evidence or a TTM textbook that the herb can be used for healing a chronic disease or symptom. 1.3 Being an active ingredient of a Thai drug formula contained in a TTM textbook. 1.4 Being an important component of a traditional household remedy. 1.5 Being able to be used for treating a disease or symptom in living things other than humans. 1.6 Being able to be used for disease prevention, body nourishment, health promotion, and beauty enhancement. 1.7 No other herb can be used as its replacement in treating a disease/ symptom, as confirmed by a licensed TTM (Thai medicine) or applied TTM (ATM) practitioner. 2. There is scientific evidence supporting its application. 2.1 There is scientific evidence supporting its application for a syndrome or disease of the body's internal organs. 2.2 There is scientific evidence supporting its application for a syndrome or disease of the body's external organs.
Herbs of economic importance	Herbs that are in demand of the markets.	1. Being herbs that are in demand, based on their volumes or amounts of exports or sales in other regions.

Table 5.5 Criteria for reviewing/screening herbs that should be designated as controlled herbs (continue)

Type of herbs	Definition	Details
Herbs that may become extinct	Herbs that grow in specific areas, are hard to propagate, grow up in a specific ecosystem, and are in high demand for use.	1. Being herbs that are grown only in a specific region, not generally found. 2. Being herbs whose origins or areas are at risk of being encroached on or destroyed. 3. Being herbs that are hard to propagate or cannot be generally grown. 4. Being herbs that need a long time to grow up and become useable. 5. Being herbs that may be extinct if their utilization is undertaken from the parts that are essential for their existence or reproduction.

1) Achievements of the operations on "controlled herbs"

According to MoPH's notification on Controlled Herb (*Kwao Khruea*, or *Butea superba* Roxb., *Pueraria candollei* var. *mirifica* (Airy Shaw & Suvat.) Niyomdham, *Mucuna macrocarpa* Wall.) of 2006, the requirements are the following:

(1) The possessor, user, caretaker, keeper or transporter of *kwao khruea* that is obtained from planting, or whose amount or quantity is greater than the allowable level, must notify the Registrar at the Central Registrar's Office (at DTAM), or the Provincial Registrar's Office (Provincial Public Health Office) in their locality.

(2) Growers of *kwao khruea* for study/research, export, sale or commercial transformation, must notify the Registrar of their growing area size, zone/region, quantities being grown with evidence.

Photo 5.3 Controlled herb (*kwao khruea*)







The reports on the operation of controlled herb (*kwao khruea*) for 2015 are to be submitted within 60 days after the end of each calendar year, i.e. 31 March 2016, including the reports on herb possession, Table 5.6, and on herb growing, Table 5.7.

Table 5.6 The provinces that reported on *kwao khruea* possession, keeping, transportation and utilization

Provinces reporting on quantities of herb possession required by the notification	Provinces reporting on herb possession, 6 provinces	Quantities of kwao khruea in possession, being kept, transported or used (kilograms)					
		White		Red		Black	
		Fresh	Dried	Fresh	Dried	Fresh	Dried
Nong Bua Lam Phu, Phangnga, Sukhothai, Phayao, Suphan Buri, Chaiyaphum, Saraburi, Trang, Roi Et, Ang Thong, Chai Nat, Prachin Buri, Krabi, Nakhon Ratchasima, Uttaradit, Phrae, Uthai Thani, Lop Buri, Kanchanaburi, Nonthaburi, Surin, Phatthalung, Nakhon Si Thammarat, Kamphaeng Phet, Nakhon Phanom, Sa Kaeo, Sakon Nakhon, Bueng Kan, Chumphon, Chachoengsao, Phra Nakhon Si Ayutthaya, Yala, Phichit, Ranong, Loei, Phitsanulok, Nakhon Nayok, Chon Buri, Sing Buri, Songkhla	Loei, Phitsanulok, Nakhon Nayok, Chon Buri, Sing Buri, Songkhla	11,717	4,046.5	11,247	1,522.5	0	0
Total		**15,782.50**		**12,768.50**		**0**	

Table 5.7 The provinces that reported on *kwao khruea* growing quantities

Provinces reporting on herb growing quantities required by the notification	Provinces reporting on herb growing, 5 provinces	Quantities of kwao khruea grown (plants, rai/gnan/sq.wa.)		
		White	Red	Black
Nong Bua Lam Phu, Phangnga, Sukhothai, Phayao, Suphan Buri, Chaiyaphum, Saraburi, Trang, Roi Et, Ang Thong, Chai Nat, Prachin Buri, Krabi, Nakhon Ratchasima, Uttaradit, Phrae, Uthai Thani, Lop Buri, Kanchanaburi, Nonthaburi, Surin, Phatthalung, Nakhon Si Thammarat, Kamphaeng Phet, Nakhon Phanom, Sa Kaeo, Sakon Nakhon, Bueng Kan, Chumphon, Chachoengsao, Phra Nakhon Si Ayutthaya, Yala, Phichit, Ranong, Loei, Phitsanulok, Nakhon Nayok, Chon Buri, Sing Buri, Songkhla	Nakhon Nayok, Phitsanulok, Phichit, Sa Kaeo, Kanchanaburi	30 rai 4 ngan 24,100 plants	4 rai 112 sq.wa. 2,007 plants	1 ngan 18 plants

Note: 1 acre = 2.5 rai; 1 rai = 4 ngan or 1,600 sq.m.; 1 ngan = 100 sq.wa. or 400 sq.m.

2) Achievements of the operations on "herbs of economic importance"

In the past, DTAM issued a policy to push five herbs (white *kwao khruea* or *Pueraria candollei* var. *mirifica* (Airy Shaw & Suvat.) Niyomdham black fingerroot or *krachai*, Asiatic pennywort or *bua-bok*, *phlai* (*Zingiber montanum* (J.Koenig) Link ex A.Dietr.), and herbal compress) to become "product champions".

In FY 2010, a study on 12 herbs with such importance was supported. Such herbs were, for example, *kritsana, cha-mod ched, kamphaeng-jedchan*, and *dongdueng*. The aim was to assess the herbs' value and importance for use in issuing a notification as "controlled herbs". But the TTM Wisdom Protection Committee resolved that such herbs should not be classified as controlled herbs; rather, their conservation, studies on cultivation/propagation, use promotion and results dissemination should be continued.

In FY 2012, research studies were supported on another 12 herbs such as *thaowanpriang, jan-daeng, lakka-jan* (*Dracaena* sp.), and *nera-phusi*. The Herb Protection Subcommittee passed a resolution for *thaowanpriang, nera-phusi, jan-daeng, and lakka-jan* to be designated as "controlled herbs. The information about such four herbs has been forwarded to the Bureau of Legal Affairs and Ethics for drafting a MoPH's notification of the herbs to become "controlled herbs" as per Section 44 of the TTM wisdom protection law.

During FYs 2014–2015, studies were supported for another 22 herbs such as *thua-din-khok,reo, chingchee, ma-toom-nim*, and *thep-tha-ro*. On 27 June 2016, the Herb Protection Subcommittee resolved that six herbs (*thua-din-khok, thep-tha-ro, ma-toom-nim, ma-hahd, hua-roi-ru*, and *reo*) should be notified as "controlled herbs", see Table 5.8.

Table 5.8 Herbs on which research studies were supported by law in FYs 2005–2015

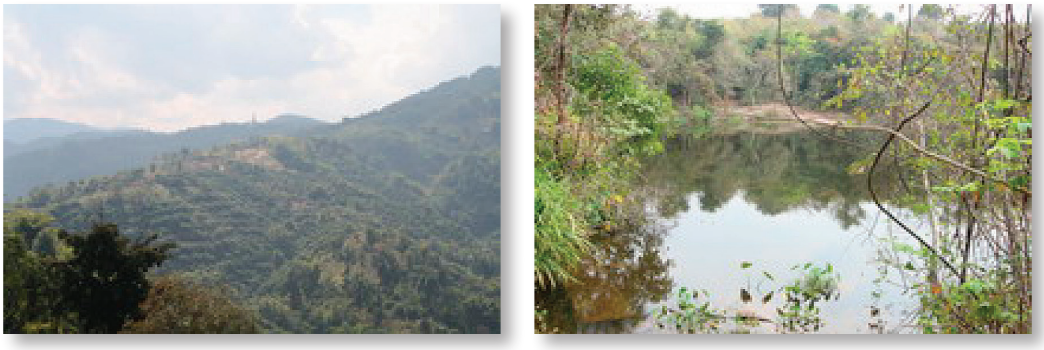
Fiscal year	Herb	Herb Protection Subcommittee's resolution
2003	*Kwao khruea*	MoPH's notification on controlled herb (*kwao-khruea*), 2006
2010	*Kritsana, cha-mod-ched, Kamphaeng-jedchan, dondueng, Khamin-khruea, plao-luead, khao-yen-nuea, khao-yen-tai, rayom-noi, rayom-yai, pitsanaht, non-tai-yahk*	The herbs should not be notified as controlled herbs.
2012	*Thaowanpriang, kamlang-wua-thaloeng, jettamunphloeng-daeng, nera-phusi, hoh-saphai-khwai, kamlang-suea-khrong, jan-khao, jan-daeng, sa-boo-luead, sa-moh (all kinds), phaya-rahkdam, sae-ma-tha-lai*	Resolution: *thaowanpriang, nera-phusi, jan-daeng* and *lakka-jan* (*Dracaena* sp.) need a notification for protection.
2014 – 2015	*Thuadin-khok, reo, chingchee, matoom-nim, thep-tharo, khanthong-phayabaht, cha-em-thai, thao-en-on, ma-hahd, nang-yaem-pa, pla-lai-phueak, ma-khang-daeng, saraphi-pa, hua-roi-ru, ob-choei, krathum-na, juk-rohini, chiangphra-nang-ae, tabtao-ton, wahn-proh-hom, sa-khahn, phangkhi*	Resolution: *thua-din-khok, thep-tharo, matoom-nim, hua-roi-ru*, and *reo* need a notification for protection.

5.2.5 Origins of herbs

According to Section 3 of the TTM wisdom protection law, "Conservation area" means a national reserved forest, an environmental protection area, a wildlife sanctuary, a hunting prohibition area, a national park and other protected areas designated for reservation and preservation of natural conditions as prescribed by law.

1) Conservation areas – for any area with (1) a natural ecosystem or (2) biodiversity or (3) the likelihood of being easily affected by human actions, Section 57 of the TTM wisdom protection law prescribes that the Minister, with the advice of the Committee, shall draw up a "Herbs Protection Management Plan" and submit it to the Cabinet for endorsement.

Photo 5.4 Forest areas under a Herbs Protection Management Plan in a herb conservation area



The plan is intended to be jointly managed through the collaboration of relevant state agencies and the communities.

Past operations

The Cabinet has approved six Herbs Protection Management Plans in the herb conservation areas under the 1999 TTM Knowledge Protection Act as described below:

Table 5.9 Six Herbs Protection Management Plans in 27 conservation areas.

Plan No.	Details of the plan	Year notified
1	The Cabinet passed a resolution on 2 January 2008 endorsing the Herbs Protection Management Plan for the Phu Pha Kut Conservation Area in Mukdahan province. The notification was published in the Government Gazette, Vol. 125, Special part 42d, dated 28 February 2008.	2008–2010
2	The Cabinet passed a resolution on 11 May 2010 endorsing the Herbs Protection Management Plans for four Conservation Areas below. The notification on this plan was signed by the Public Health Minister on 4 July 2010 and published in the Government Gazette, Vol. 127, Special part 101d, dated 24 August 2010. The four areas are: 1. Ban Hua Thug community forest, Chiang Dao Wildlife Sanctuary, Chiang Mai province 2. Sublungka Wildlife Sanctuary, Lop Buri province 3. Phu Chong–Na Yoi National Park, Ubon Ratchathani province 4. Khao Salat Dai Forest, Thap Lan National Park, Nakhon Ratchasima province	2010–2012
3	The Cabinet on 15 November 2011 endorsed the Herbs Protection Management Plans for seven Conservation Areas below. The notification on this plan was signed by the Public Health Minister on 30 January 2012 and published in the Government Gazette, Vol. 129, Special part 53d, dated 21 March 2012. The seven areas are: 1. Wildlife Hunting Prohibition Area, Somdech Phra Srinagarindra Parks, Kanchanaburi province 2. Mae Wong National Park, Kamphaeng Phet province 3. Phu Langka National Park, Nakhon Phanom province 4. Thung Salaeng Luang National Park, Phitsanulok province 5. Thale Ban National Park, Satun province 6. Pang Sida National Park, Sa Kaeo province 7. Na Yung–Nam Som National Park, Udon Thani province	2012–2014

Table 5.9 Six Herbs Protection Management Plans in 27 conservation areas. (continue)

Plan No.	Details of the plan	Year notified
4	The Cabinet on 6 March 2012 endorsed the Herbs Protection Management Plans for eight Conservation Areas below. The notification on this plan was signed by the Public Health Minister on 5 April 2012 and published in the Government Gazette, Vol. 129, Special part 83d, dated 21 May 2012. The eight areas are: 1. Ban Rim Phrom and Phu Kratae Community Forests, Phu Khiao Wildlife Sanctuary, Kaset Sombun district, Chaiyaphum province 2. Kut Tawan Forest, Thap Lan National Park, Na Di district, Prachin Buri province 3. Tambon Mae Sai Community Forest, Rong Kwang district, Phrae province 4. Dun Lamphan No-Hunting Area, Na Chueak district, Maha Sarakham province 5. Phu Suan Sai National Park, Na Haeo district, Loei province 6. Doi Khun Tan National Park, Hang Chat district, Lampang province 7. Ramkhamhaeng National Park, Khiri Mat district, Sukhothai province 8. Phu Sa Dok Bua National Park, Chanuman district, Ubon Ratchathani province	2012–2014
5	The Cabinet on 9 October 2012 endorsed the Herbs Protection Management Plans for five Conservation Areas below. The notification on this plan was signed by the Public Health Minister on 16 November 2012 and published in the Government Gazette, Vol. 130, Special part 21d. The five areas are: 1. Ban Thung Sung Community Forest Conservation Area, Khao Mai Kaeo–Khuan Ying Wua National Reserved Forest, Ao Luek district, Krabi province 2. Phu Kham Bok Forest Conservation Area, Nong Phok district, Roi Et province 3. Doi Mon Ruesi Forest Conservation Area, Khun Mae Kuang National Reserved Forest, Thep Sadet subdistrict, Doi Saket district, Chiang Mai province 4. Khun Nam Wong Community Forest Conservation Area, Mae Ing National Reserved Forest (Right Side), Ban Muang Yai Nuea-Tai, Mung Yai subdistrict, Wiang Kaen district, Chiang Rai province 5. Tambon Mae Yuam Forest Conservation Area, Mae Yuam National Reserved Forest (Right Side), Mae Sariang district, Mae Hong Son province	2013–2015

Table 5.9 Six Herbs Protection Management Plans in 27 conservation areas. (continue)

Plan No.	Details of the plan	Year notified
6	The Cabinet on 14 May 2013 endorsed the Herbs Protection Management Plans for two Conservation Areas below. The notification on this plan was signed by the Public Health Minister on 31 may 2013 and published in the Government Gazette, Vol. 130, Special part 78d. The two areas are: 1. Wat Khao Phanom Kao Forest, Mu 9, Ban Khao Phanom Kao, Nong Phayom, Ngio Rai, and Nong Plong subdistricts, Wang Sai Phun district, Phichit province 2. Wat Pong Kham Forest, Santi Suk district, Nan province	2013–2015

The operations mentioned above have benefited the communities and local residents in the following aspects:

(1) Networks and cooperation have been set up among relevant state agencies and communities in the conservation efforts, knowledge sharing, and herb utilization in a suitable manner.

(2) There is a registry of herb names and a herb encyclopaedia, and a geographic information system or database for herbs for use in monitoring herbal changes in the locality.

(3) There are surveys and technical research studies including extended development.

(4) The utilization for eco-tourism or learning about herbs in the nature of local residents and those in nearby areas.

(5) There is awareness of the value of herbs in the locality as well as the traditional ways of treatment of illnesses of local residents and communities.

Since FY 2016 until now, for many conservation areas, steps are being taken towards the designation of models for conservation, protection and utilization in a sustainable and appropriate manner. Two herb protection management plans have been submitted to the Cabinet for endorsement:

(1) Ban Tha Samakkhi Community Forest, Mu 11, Mae Thot subdistrict, Thoen district, Lampang province

(2) Khlong Nakha Wildlife Sanctuary, Suk Samran district, Ranong province.

Anyway, studies, analyses and assessments of such mechanisms will be undertaken for use in further programme improvement, especially in the protection of origins of herbs in accordance with the current situation. The names of herbs in each locality are shown in Table 5.10.

Table 5.10 Herb protection management plans in conservation areas, 2008–2015

Herb protection management plan	Herbs by type of value		
	Herbs valuable for research	Herbs with economic value	Herbs likely becoming extinct
Herb protection management plans in conservation areas, 2008–2010 (short-term plan, 1 area)			
1) Mukdahan	*Ma-kha-mong, pha-yung*	*Chingchan, makok-pa*	*Pra-du*
Herb protection management plans in conservation areas, 2010–2012 (short-term plans, 4 areas)			
1) Chiang Mai	*Hoh-saphai-khwai, khueang-khaeng-ma*	*Ka-sampik*	*Wahn-nok-nang-aen*
2) Lop Buri	*Kam-yan, kra-bok*	*Pra-du, phaya-rahk-dam*	*Jan-pha*
3) Ubon Ratchathani	*Kwao-khruea daeng, kwao-khruea khao*	Doe-mai-ru-lom, khamin-khruea	Thao-en-on
4) Nakhon Ratchasima	*Kwao-khruea daeng, kwao-khruea khao*	*Kritsana, kaeo-klangdong*	*Ma-mao-khai-pla*
Herb protection management plans in conservation areas, 2012–2014 (short-term plans, 7 areas)			
1) Kanchanaburi	*Jettamunphloeng-khao, jetmunphloeng-daeng*	*Rayom*	*Ma-kham-pom, samoh-phiphek*
2) Kamphaeng Phet	*Kwao-khruea daeng, kwao-khruea khao, rang-jued*	*Mueadkhon, yan-liphao*	*Nang-yaem-pa*

Table 5.10 Herb protection management plans in conservation areas, 2008–2015 (continue)

Herb protection management plan	Herbs by type of value		
	Herbs valuable for research	**Herbs with economic value**	**Herbs likely becoming extinct**
3) Nakhon Phanom	*Khaolahmdong, ma-duea, reo*	*Pra-du, chingchan, teng*	*Pra-dong 32 (sirindhornvally), kraphrao-saksit*
4) Phitsanulok	*Phaya-rahk-dam, sae-ma-thalai*	*Koh-ta-mu, ta-khian-hin, pha-yung*	*Kritsana, ma-kham-pom, samoh-thai*
5) Satun	*Kamphaeng-jedchan, chingchee, pla-lai-phueak*	*Cha-em-thai, ngueak-pla-moh*	*Ma-kham-pom, khad-mon*
6) Sa Kaeo	*Kritsana, sae-ma-thalai*	*Pla-lai-phueak, cha-em-pa*	*Phrajao-ha-phra-ong, ma-kratuep-rong*
7) Udon Thani	*Kathom-luead, nam-kliang*	*Khao-yen-tai, sara-phi-doi*	*Krajonnao, wahn-ngu-jong-ang*
Herb protection management plans in conservation areas, 2012–2014 (short-term plans, 8 areas)			
1) Chaiyaphum	*Prongfa, mi-men*	*Khao-yen-tai, doe-mairu-lom, lod-thanong*	*Khao-yen-nuea, dongdueng, kamlang-suea-khrong*
2) Prachin Buri	*Krachao-phi-mod, phaya-suea-khrong*	*Kwao-khruea daeng, kwao-khruea khao*	*Non-tai-yahk, krug-khama0, sa-boo-luead-thao*
3) Phrae	*Kamlang-wua-thaloeng, khao-yen-nuea*	*Chiang-phra-nang-ae, mok-luang, ma-kham-khruea*	*Nera-phusi-thai, phaya-rahk-dam*
4) Maha Sarakham	*Khai-nao, ngio-pa*	*Krung-khamao, ma-kha-mong, reo*	*Tio-mon, phakkud, fai-duean-ha*
5) Loei	*Khaminchan, fa-thalai-jon, wahn-hang-jorakhe*	*Wahn-nang-kham, kamlang-wua-thaloeng, ueang-mai-na*	*Kritsana, khao-yen-tai, khao-yen-nuea*
6) Lampang	*Kwao-khruea-khao, kwao-khruea-daeng, kwao-khruea-dam*	*Kang-khi-mod, yom-hin, khrai-mod, ked-kham*	*Ma-kham-khruea, khammok-liuang*
7) Sukhothai	*Pra-kham-kai, phayom*	*Pra-du, non-tai-yahk*	*Kamlang-changsahn, ma-kha-tae*
8) Amnat Charoen	*Pra-du, nao-duean-ha*	*Ma-kha-mong, ma-krathueprong*	*Wai-nang*

Table 5.10 Herb protection management plans in conservation areas, 2008–2015 (continue)

Herb protection management plan	Herbs by type of value		
	Herbs valuable for research	**Herbs with economic value**	**Herbs likely becoming extinct**
Herb protection management plans in conservation areas, 2013–2015 (short-term plans, 5 areas)			
1) Krabi	Doe-mairu-lom, thao-en-on	*Ma-mao-khaipla, khamin-khruea*	*Ma-duea-thao, ma-klam-ta-chang*
2) Roi Et	*Ma-thalai-rong, khamin-khruea, jettamunphloeng*	*Kao-nang-ni, rang-jued, kwao-khruea-daeng*	*Ma-kham-khruea, jong-ang-ha-liam, sin-bo-hi*
3) Chiang Mai	*Pla-lai-phueak, khamin-ruesi, hoh-luead-nai*	*Hoh-luead-nai, kamlang-suea-khrong, kularb-phanpi*	*Kwao-khruea-deang, kwao-khruea-khao, wahn-hua-sueb*
4) Chiang Rai	*Ka-sam-pik, khad-mon-luang, nom-wua*	*Di-pli, phak-nahm, ya-tod-ma*	*Di-mi, namnom-rajasi, en-suea-khrong*
5) Mae Hong Son	*Khai-pla, rang0jued, nae-khruea*	*Ngio-pa, tin-nok, phe-ka, ma-kham-pom, samoh-thai*	*Khruea-on-daeng, phe-ka, ma-sahn, oi-sam-suan*
Herb protection management plans in conservation areas, 2013–2015 (short-term plans, 2 areas)			
1) Phichit	*Kwao-khruea-deang, kwao-khruea-khao*	*Ma-kha-mong, pra-du-pa*	*Dongdueng, Kamphaeng-jedchan, kling-klang-dong*
2) Nan	*Nera-phusi-thai, plao-luang, plao-noi*	*Phan-ngu-noi, sa-moh-thai, sa-moh-phiphek*	*Hoh-saphai-khwai, kamlang-chang-sahn, ma-krathuep-rong*

2) Non-conservation areas

According to Section 61 of the 1999 TTM Knowledge Protection Act, a non-conservation area is any area with the following characteristics:

(1) the natural ecosystem, or

(2) biological diversity of such an area may be destroyed, or

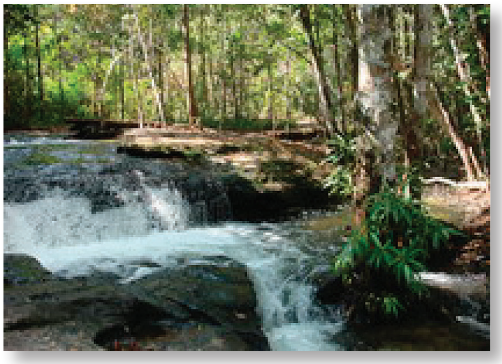
(3) may be affected simply by any act of human, or

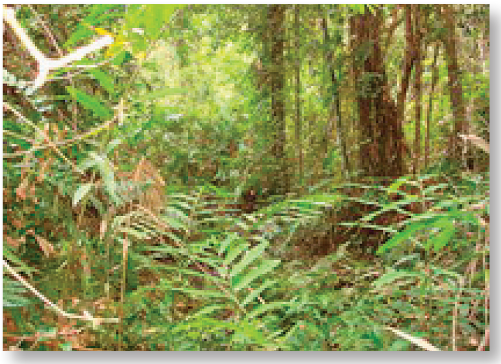
(4) the entering into such area for utilization of herbs that may be at risk of extinction, or

(5) genetic reduction, or

(6) the official aims to enhance public participation in managing, administering, developing and utilizing the herbs in that area; if such an area has not been designated as a conservation area, the Minister shall, with advice of the Committee, have the power to issue a ministerial notification designating that area as a herbs protected area.

Photo 5.5 Forest areas under herb protection management plans outside the conservation areas





In this regard, for 2010–2011 some budget was allocated by the TTM Knowledge Fund for surveys and studies of herbs in the areas that are the origins or habitats of herbs in non-conservation areas, namely:

(1) Kham Hua Haet forest, Thung Fon district, Udon Thani province

(2) Nong Paen forest, Phon Charoen district, Bueng Kan province

(3) Dong Keng forest, Ban Nong Phlang, Mu 3, Dong Kheng subdistrict, Ban Nong Song Hong district, Khon Kaen province

(4) Forest of the Phu Phan Royal Development Study Centre, Ban Na Nok Khao, Huai Yang subdistrict, Mueang district, Sakon Nakhon province

(5) Nong Hi Cultural Forest, Chiang Yuen district, Maha Sarakham province

(6) Nong Sam Haet Community Forest, Ban Muang Khai, Ban Chiang Khruea, Ban Kham Sang Bo, Kra Chai subdistrict, Pa Tio district, Yasothon province

In 2013, an additional budget was allocated by the TTM Knowledge Fund for surveys in another eight areas in seven provinces – Lamphun, Phayao, Kalasin, Bueng Kan, Surin, Buri Ram, and Si Sa Ket.

For 2017, plans and targets have been set for another 50 areas, covering an area of no less than 15 million rai (6 million acres).

Table 5.11 Herb protection management plans outside conservation areas, 2010–2013

Non-conservation area (province)	Herbs by type of value		
	Herbs valuable for research	**Herbs with economic value**	**Herbs likely becoming extinct**
1) Bueng Kan	*Thao-en-on, nam-nom-rajsi*	*Wahn-chak-modluk*	*Saled-phangphon-tua-mia, saled-phangphon-tua-phu*
2) Maha Sarakham	*Kamphaeng-jedchan, sa-khan*	*Doe-mairu-lom*	*Thongkwao-khruea*
3) Kalasin	*Kham-mok-luang, nom-sao, prong-liam*	*Jik or teng, hang or rang-daeng, kheng, liam or toomka*	*Muead-khon, muead-ae, ma-kok-liam*
4) Buri Ram	*Khan-thong-phayabaht, jan-hom*	*Yo-pa, Kamphaeng-jedchan*	*Wahn-samsip, sap-suea, Jetta-phangkhi, tio-khon*
5) Phayao	*Ma-haen, sa-moh-phiphek, saleang-jai or ma-tueng*	*Poh-bid, plao-yai, plao-noi*	*Plao-dokdaek, plao-luead*
6) Si Sa Ket	*Teng, rang, ta-baek*	*Ka-sampik, khadmon-luang, nom-wua*	*Dongdueng, Kamphaeng-jedchan*
7) Sing Buri	*Kra-jiab, kra-chai, kra-dangnga-thai*	*Krathin-narong, kritsana, khanthong-phayabaht*	*Jan-pha, thaowanpriang, jettamun-phloeng-daeng*
8) Mae Tha district, Lamphun province	*Pla-lai-phueak, ta-khian-thong*	*Kritsana, kamlang-suea-khrong*	*Ma-krathuep-rong, ob-choei*
9) Li district, Lamphun province	*Ma-khuea-khruea, khamin-khruea, jettamun-phloeng-daeng*	*Ma-duea-pong, ma-kham-pom, doe-mairu-lom*	*Kritsana, khamin-khao*
10) Surin	*Sa-mae-sahn, ma-kham-pom, namjai-khrai*	*Proh-pa, ueang-mai-na*	Mueadkhon, oi-chang

Besides, social mobilization has been underway in coordination with relevant partners. A memorandum of understanding has been signed with the Royal Forest Department aiming to conserve, protect, and use herbs in 60 community forests with flexibility and popular sector collaboration as detailed in Table 5.12.

Table 5.12 Sixty community forests under MOU with Royal Forestry Department, 2016

Health region	Community forest, subdistrict, district, province	Herbs found	Forest Resource Management Office (FRMO)
1	- Ban Daeng Huai Yen Community Forest, Mu 14, Ban Hong, Ban Hong, Lamphun - Ban Tha Chomphu Community Forest, Mu 4, Tha Pla Duk, Mae Tha, Lamphun - Ban Talat Khilek Community Forest, Mu 1, Mae Pong, Doi Saket, Chiang Mai - Ban Mae Han Community Forest, Mu 4, Ban Kat, Mae Sariang, Mae Hong Son	*Ma-muang-hao-ma-nao-ho, pla-lai-phueak*	FRMO 1
	- Ban Ton Tong Community Forest, Mu 5, Phichai, Mueang, Lampang - Ban Wang Hong Community Forest, Mu 1, Wang Hong, Mueang, Phrae - Ban Den Phatthana Community Forest, Mu 12, Puea, Chiang Klang, Nan - Ban Pang Ngun Community Forest, Mu 6, Soi, Wang Chin, Phrae - Ban Bun Chaem Community Forest, Mu 1, Nam Lao, Rong Kwang, Phrae	*Ma-kluea, nam-nom-rajsi, khao-yen-nuea*	FRMO 3
2	- Ban Pong Din Dam Community Forest, Nong Kathao, Nakhon Thai, Phitsanulok - Ban Nong Yang Community Forest, Mu 8, Ban Yang, Wat Bot, Phitsanulok - Ban Khao Noi Community Forest, Mu 5, Dong Pra Kham, Phrom Phiram, Phitsanulok - Ban Huai Lan Community Forest, Mu 9, Nam Chun, Lom Sak, Phetchabun	*Ma-kham-pom, yang-na*	FRMO 2
	- Ban Huai Charoen Community Forest, Mu 8, Pha Lueat, Tha Pla, Uttaradit - Ban Mae Kit Luang Community Forest, Mu 1, Mae Kasa, Mae Sot, Tak	*Kum-nam, wahn-chak-modluk*	FRMO 4

Table 5.12 Sixty community forests under MOU with Royal Forestry Department, 2016 (continue)

Health region	Community forest, subdistrict, district, province	Herbs found	Forest Resource Management Office (FRMO)
3	- Ban Khlong Huai Wai Community Forest, Mu 21, Mae Poen, Mae Poen, Nakhon Sawan - Ban Pong Kamphaeng Community Forest, Mu 18, Noen Kham, Noen Kham, Chai Nat	*Pla-lai-phueak*	FRMO 5
	- Ban Nong Sai Community Forest, Mu 10, Wang Khuang, Phran Kratai, Kamphaeng Phet - Ban Khao Lon Community Forest, Mu 7, Khao Chet Luk, Thap Khlo, Phichit	*Khanthong-phayabaht*	FRMO 4
4	- Ban Khao Anpot Community Forest, Mu 5, Sap Takhian, Chai Badan, Lop Buri - Ban Sap Kham Community Forest, Sap Khanun, Muak Lek, Saraburi - Ban Phra Phutthabat Noi Community Forest, Mu 10, Song Khon, Kaeng Khoi, Saraburi	*Cha-ruesi, phaya-mue-lek*	FRMO 11
5	- Ban Ko Ma Sang Community Forest, Dan Thap Tako, Chom Bueng, Ratchaburi	*Doe-mairu-lom, Kao-yen-tai*	FRMO 7
	- Ban Huai Saphan Samakkhi Community Forest, Nong Rong, Phanom Thuan, Kanchanaburi - Ban Khong Ta Bang Community Forest, Mu 10, Tha Mai Ruak, Tha Yang, Phetchaburi	*Thao-en-on, ya-nang*	FRMO 10
6	- Ban Takrao Thong Community Forest, Mu 5, Ban Laeng, Mueang, Rayong - Ban Chanthi Community Forest, Mu 1, Tha Kum, Mueang, Trat	*Saled-phangphon-tua-phu*	FRMO 6
	- Ban Non Phueng Community Forest, Mu 3, Ban Hang Hin, Mu 4, Ban Suan Phueng, Mu 5, Dong Bang, Prachantakham, Prachin Buri - Ban Phrao Community Forest, Mu 1, Watthana Nakhon, Sa Kaeo	*Phruad, Kamphaeng-jedchan*	FRMO 9

Table 5.12 Sixty community forests under MOU with Royal Forestry Department, 2016 (continue)

Health region	Community forest, subdistrict, district, province	Herbs found	Forest Resource Management Office (FRMO)
7	- Ban Nong Bua Noi Community Forest, Mu 5, Khok Sawang, Phanom Phrai, Roi Et - Ban Don Chao Pu Community Forest, Mu 3, Sai Mun, Nam Phong, Khon Kaen	*Tubmub, proh-pa*	FRMO 7
	- Ban Pa Khok Hin Lat Community Forest, Mu 3, Nong Pling, Mueang, Maha Sarakham - Ban Khok Pa Si Community Forest, Mu 1, 2, 6, 7, 8, Nong Hang, Kuchinarai, Kalasin	*Plao-yai, plao-noi, ma-kham-pom*	FRMO 10
8	- Ban Huai Rai Burapha Community Forest, Mu 10, Upmung, Nong Wua So, Udon Thani - Ban Doi Koi Community Forest, Mu 2, Sawang, Phanna Nikhom, Sakon Nakhon - Ban Phon Charoen Community Forest, Mu 7, Wang Ta Mua, Mueang, Nakhon Phanom	*Khanthong-phayabaht, muead-ae*	FRMO 6
9	- Ban Hin Lat Community Forest, Mu 4, Chi Bon, Ban Kwao, Chaiyaphum - Ban Khao Sip Sang and Khao Khiao Community Forest, Mu 11, Makluea Kao, Sung Noen, Nakhon Ratchasima - Ban Chan Community Forest, Nong Teng, Krasang, Buri Ram	*Non-tai-yahk, ma-kok*	FRMO 8
10	- Ban Dong Nong I-thao Community Forest, Mu 4, Lao Daeng, Don Mot Daeng, Ubon Ratchathani - Ban Non Yai Community Forest, Siao and I-se, Pho Si Suwan, Si Sa Ket - Ban Khu Khat Community Forest, Mu 2, Nong Lao, Khueang Nai, Ubon Ratchathani - Ban Si Sombun Community Forest, Mu 3, Si Kaeo, Loeng Nok Tha, Yasothon	*Kamphaeng-jedchan, Ma-dan*	FRMO 4

Table 5.12 Sixty community forests under MOU with Royal Forestry Department, 2016 (continue)

Health region	Community forest, subdistrict, district, province	Herbs found	Forest Resource Management Office (FRMO)
11	- Ban Huai Yai Community Forest, Mu 2, Song Phi Nong, Tha Sae, Chumphon - Ban Khron Community Forest, Mu 3, Khron, Sawi, Chumphon	*Dongduen, Kamphaeng-jedchan*	FRMO 11
	- Ban Ao Ai Yo Community Forest, Mu 4, Nam Tok, Thung Song, Nakhon Si Thammarat - Ban Thung Sung Community Forest, Mu 4, Khao Yai, Ao Luek, Krabi - Ban Sa Kaeo Community Forest, Mu 8, Sai Thong, Chai Buri, Surat Thani - Ban Wang Siladireksan Community Forest, Mu 3, Phoemphun Sap, Ban Na San, Surat Thani	*Ma-prang, sa-khan, phak-liang*	FRMO 12
12	- Ban Nikhom Phatthana Community Forest, Mu 7, Chamuang, Rattaphum, Songkhla - Ban Na Prik Community Forest, Mu 9, Khuan Don, Khuan Don, Satun - Ban Pa Phong Community Forest, Mu 9, Ta Mot, Tamot, Phatthalung - Ban Thung Luang Community Forest, Mu 7, Wang Maprang, Wang Wiset, Trang	*Pla-lai-phuak, ma-muang-himmaphan*	FRMO 12
	- Ban Chulabhorn Phatthana 12 Community Forest, Mu 13, Sukhirin, Sukhirin, Narathiwat	*Kamlang-suea-khrong, da-la*	FRMO 13

3) Private land

Under the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, Section 64 prescribes that in order to enhance public participation in protecting, promoting and developing of herbs, the owner or possessor of land which is the place of origin of herbs or which may be used for the plantation of herbs shall have the right to register such land with the Registrar for assistance or support under this Act. And Section 65 prescribes that the owner or possessor of land registered under Section

64 shall have the right to assistance or support in accordance with the regulation as notified by the Minister.

Draft ministerial rules or regulations on this matter are being reviewed by the Office of the Council of State; and they are expected to be enacted later.

5.3 Monitoring and protection of the rights in TTM wisdom and herbs

5.3.1 Carry out the follow-ups and monitoring of actions related to the protection of 25 items of TTM wisdom and herbs, namely *kra-jiab-daeng, kra-chai-dam, kwao-khruea-khao, som-khaek, fa-thalai-jon, khamin-chan, chumhed-thet, bua-bok, mon, phlai,* peppercorn *(phrik-thai),* mangosteen*, kra-jiao, dongdueng, khamin-khruea, kamphaeng-jedchan, ya-nang, rang-jued, ma-kham-pom, kritsana, plao-luead, ma-rum*, herbal compress, Thai massage and Ruesie Dutton. The actions include a search for patent information by type of relevant patents in seven groups of countries, i.e. the World Intellectual Property Organization, the Japan Patent Office, the European Patent Office, the U.S. Patent and Trademark Office, the Chinese Patent Office, the Korean Intellectual Property Office, and the Department of Intellectual Property (of Thailand). A monthly report is to be prepared and submitted to relevant subcommittees for consideration. If any violation or action is found to affect the Thai TTM wisdom or herbs, a protest or revocation will be filed against it (see Table 5.13).

5.3.2 Check or examine the descriptions of the trademarks that have been submitted for registration at the Department of Intellectual Property to see whether or not the trademarks are similar to any item of the TTM wisdom and herbs in order to take action regarding protest and revocation.

The results of the search and examination of the patent information on 25 items of TTM wisdom and herbs in the databases of the patent offices of seven groups of countries in the section related to TTM wisdom and herbs (A61) are shown in Table 5.13.

Table 5.13 No. of patent registrations related to 25 target items of TTM wisdom and herbs

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of patent registrations	152	144	109	80	4,293	2,248	2,468	2,110	1,512

Source: Department of Thai Traditional and Alternative Medicine, MoPH, 31 July 2016.

Table 5.13 Results of the examination of trademark registration requests, 47 categories, at Department of Intellectual Property

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
No. of requests	23,400	23,600	22,400	18,800	14,000	6,400	12,800	13,800	17,400

Source: Department of Thai Traditional and Alternative Medicine, MoPH, 31 July 2016.

5.3.3 Prepare to set up and develop a database of TTM wisdom and herbs in response to right registration and for use as a tool and mechanism for wisdom/knowledge protection at the international level, based on the studies and lessons learned about this matter from India.

5.4 International operations and cooperation

5.4.1 Prepare a plan to participate in a meeting with the World Intellectual Property Organization (WIPO) on mechanisms and measures for traditional knowledge/wisdom protection.

5.4.2 Coordinate and take actions together with other relevant agencies in accordance with international laws and agreements such as the Convention on Biological Diversity, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), agreements of traditional wisdom protection under WIPO, and negotiations on ASEAN and regional free trade agreements.

5.4.3 Operations undertaken together with other relevant agencies according to international laws and agreements.

1) Convention on Biological Diversity – participate in meetings on preparations, negotiations, agreements, regulations, measures, and conditions for the protection, safeguard, access and sharing of benefits from natural resources at the ASEAN and regional levels for use in the preparation of operation framework under the Nagoya Protocol in four major issues as follows:

1.1) Procedures or mechanisms for disseminating the information about the access and sharing of benefits.

1.2) Measures for enhancing or developing the capacity of organizations and personnel in developing countries.

1.3) Measures for creating awareness of the importance of genetic resources and local wisdom related to the use of genetic resources.

1.4) Cooperation process and organizational management mechanisms in promoting the operations in accordance with the Nagoya Protocol and the proceedings for the case that does not follow the Nagoya Protocol.

Thailand has the following conclusions and recommendations:

a) Support communications for enhancing knowledge and understanding among the agencies that oversee and possess resources, including givers and users as well as research and private agencies, and educating the public, probably by drawing up a curriculum for educational institutions and holding dissemination meetings or training sessions for relevant persons.

b) Coordinate, prepare, and expedite the capacity building systematically at the international, regional, national, community and individual levels to enhance the preparedness and potential within the country and for use as the basis for developing strategic guidelines. This could be done by holding a meeting for regional experts probably with funding from the Global Environment Facility (GEF), and then asking the GEF Secretariat to analyze the results for consideration at the ICNP 2.

c) Use the operational process and steps of the Cartagena Protocol on Biosafety.

d) Focus on the integrated management of relevant agencies and strengthen each agency's information system in response to the operations according to the Protocol.

2) The protection of traditional wisdom under WIPO's agreement by participating in meeting/preparation/negotiations on free trade agreements at the ASEAN and regional levels as follows:

2.1) Participating in a meeting of Like-Minded Countries on traditional knowledge and folklore in Bali, Indonesia, which prepared draft suggestions about the protection of traditional knowledge (TK) and traditional cultural expressions (TCEs) for submission to the next WIPO IGC.

2.2) Participating in meetings of the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (WIPO IGC), focusing on the protection of traditional knowledge.

2.3) Participating in the Workshop on IPR and Issue an Intellectual Property for Traditional Knowledge of BIMSTEC Countries, held in New Delhi, India, emphasizing operations on traditional medicine regarding the educational systems, conservation and protection of traditional wisdom.

3) Operations according to the CITES Convention.

4) Operations according to the Convention for the Safeguarding of the Intangible Cultural Heritage.

5) Participation in meetings with various agencies (Department of Intellectual Property, Department of Agriculture, Office of Natural Resources and Environment Policy and Planning, Ministry of Culture, and Ministry of Foreign Affairs) in enforcing or developing laws related to intellectual property, biodiversity, and local wisdom.

5.5 Supporting, monitoring and evaluating the operations of provincial registrars under the 1999 TTM Knowledge Protection Act

According to Section 3 of the Act, "registrar" means the Central Registrar or the Provincial Registrar, as the case may be**".** And Section 13 prescribes that DTAM's director-general shall be the Central Registrar, and the Provincial Chief Medical Officer shall be the Provincial Registrar of each province, whose duties are as specified in the law. The operations in this regard have been ongoing since 2003.

Another important mechanism for the TTM wisdom protection is the TTM Knowledge Fund, which has been supporting research and development activities, provincial networks and local situation reviews. The summary of the budgetary support from the Fund is shown in Table 5.15.

Table 5.15 Budget of the Thai Traditional Medical Knowledge Fund, FYs 2005–2019

Fiscal year	2005	2006	2007	2008	2009	2010	Total (million baht)
Budget received (million baht)	10	20	40	80	150	138	1,153
Fiscal year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	
Budget received (million baht)	120	120	120	120	120	115	

Source: Department of Thai Traditional and Alternative Medicine, MoPH, 31 July 2016.

5.6 Thai Traditional Digital Knowledge Library

The development of the Thai Traditional Digital Knowledge Library (TTDKL) has been undertaken under the concept of having the database of Thai traditional medicine, indigenous medicine and herbs as a central database or digital library to which everyone can have access rapidly from everywhere, at anytime, via the information technology system. The library is the data bank of Thai traditional and indigenous medical wisdom or knowledge for academics, researchers and the general public to use as references and for other benefits in the future. It is also an important tool for the monitoring and protection of TTM wisdom.

DTAM's Office of Information and Knowledge Bank, a core agency in this regard, has been implementing the TTDKL project since 2014 by revising the old databases of the department so that they all can be linked to each other and connected to outside agencies. The aims are to develop all data or information as the same database; transliterate, translate and transform/revise traditional textbooks; develop sets of codes of TTM/IM wisdom; and revise the Thai massage wisdom

in the national TTM textbook. The development of these information systems will be digitally recorded and used as an important input to be ultimately fed into the TTDKL.

This section will illustrate the overall picture of the information system especially the need for developing the TTM/IM and herb information system before presenting the details of each issue.

5.6.1 Information on Thai traditional and indigenous medicine and herbs

In developing the information system for inclusion in the digital library, importance has been given to the body of knowledge including indigenous medicine and traditional Thai medicine in the form of national textbooks. Both knowledge components are connected to herbs, so they all have to be compiled for further development and use as appropriate for the current situation.

1) Tacit knowledge of folk healers: healing practices and theory with specialties but lacking successors

According to the Central Registrar's Office, as of mid-2016, there are 57,665 folk or indigenous healers and the indigenous medical knowledge was found to be recorded in palm-leaf (*bai-lahn*) notebooks, *pap-sa* books or others collected by many folk healers, temples and universities. As such healers are mostly elderly persons, their knowledge might be lost with their demise. To date there has been no system to support the systematic transliteration, explanation, collection and dissemination in a proper direction; it is necessary to undertake studies and transliterate such knowledge.

2) TTM knowledge in textbooks and inscriptions, written in old Thai language and difficult to understand

In 2016, the MoPH issued a notification designating 154 national TTM textbooks and 12,125 national Thai drug formulas (see Table 5.3), including some sub-scriptures inscribed in old Thai language and hard to understand for present-day people. Besides, according to the TTM wisdom registration data (Section 15 of the 1999 TTM Knowledge Protection Act), there are 167,824 items of TTM wisdom, including 159,840 Thai drug formulas and 7,984 TTM textbooks (Central Registrar's

database, 31 July 2016). Such texts and formulas were written or recorded in the old Thai language, based on local dhamma (dharma) and dialects, so they cannot be read, analyzed and translated by the general public. Thus, it is necessary to rely on experts in TTM and the old language to translate them into the present-day Thai language. However, there are constraints; there are very few experts in such fields and most of them are very old. Moreover, it is expected that many more personal formulas and texts have not been registered.

It is necessary that all the scriptures be transliterated, translated, transformed and revised by TTM experts/masters/teachers and herb/animal/mineral technical officers to correctly interpret, explain and revise. That will lead to the grouping and coding of TTM wisdom as well as systematic data recording in the digital knowledge bank. An "explanation of specific words for each textbook" needs to be prepared for use in further knowledge protection and research/development.

3) TTM knowledge and herbs with unclear scientific references

Upon enactment of the Control of Healing Arts Practices Act, B.E. 2479 (1936), TTM practitioners were required not to use science and technology for further development of TTM knowledge. Over 50 years later, science could be used in the TTM educational system under the 1939 healing arts practices control law amendment no. 9 of B.E. 2530 (1987). But in practice, very little of science was actually used by in TTM practitioners for development purposes, resulting in unclear scientific references regarding the knowledge of TTM and herbs in many aspects. For example, the scientific name of each herb is unclear according to the taxonomy principles. Until today, there have been arguments about Khrai-khruea (*Aristolochia spp.*) being carcinogenic; and the herb has been deleted from the herbal product list in the National List of Essential Medicines. But it has been argued that the deleted *khrai-khruea* is not the one with the same scientific name, while DTAM claims that the mixing of several herbs might help decrease the drug's toxicity.

5.6.2 Development of digital system towards digital library

1) Definition and scope of Thai Traditional Digital Knowledge Library (TTDKL)

The TTDKL is a system of knowledge bank of Thai traditional and alternative medicine and herbs in the form of digital library, aiming to provide efficient and rapid access to the information. The access or search can be done on herbs, Thai medicine and pharmacy dictionary, TTM textbooks, research papers, legal documents, etc. It also aims to enhance the use of the knowledge bank for TTM/IM wisdom protection and promotion, herbal drug registration, health-care provision, extended research at all levels, self-healthcare, and community economy promotion of the country.

Diagram 5.1 Thai Traditional Digital Knowledge Library (TTDKL) or digital information system of Thai traditional medical knowledge in Thailand

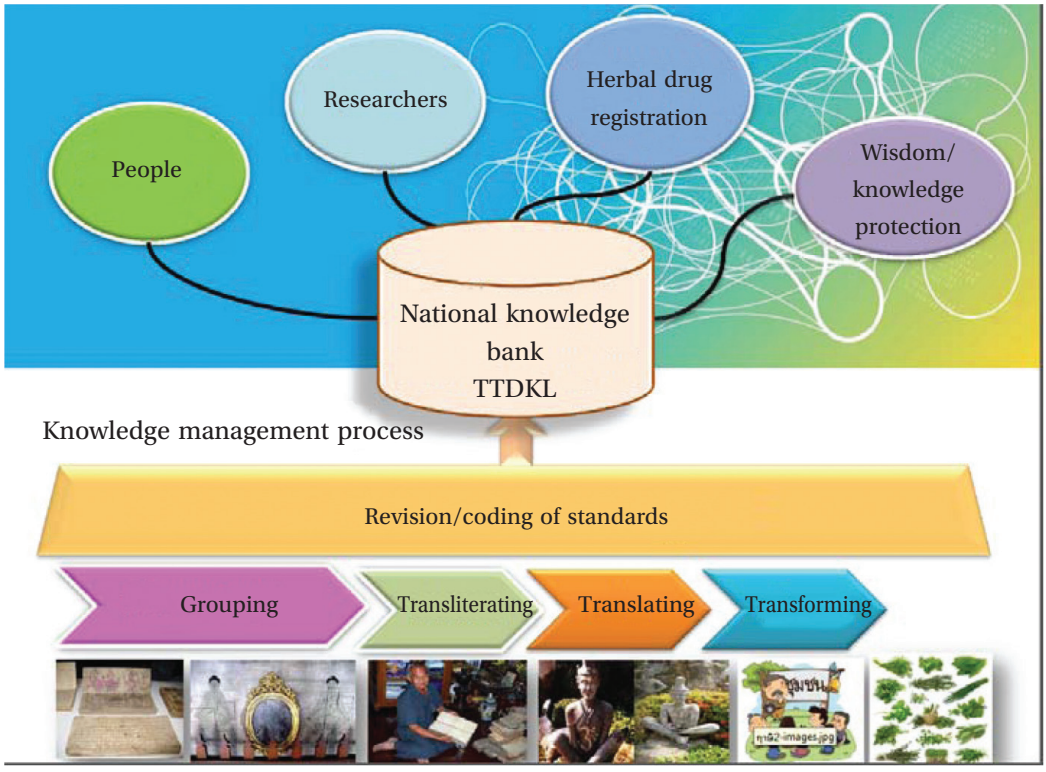
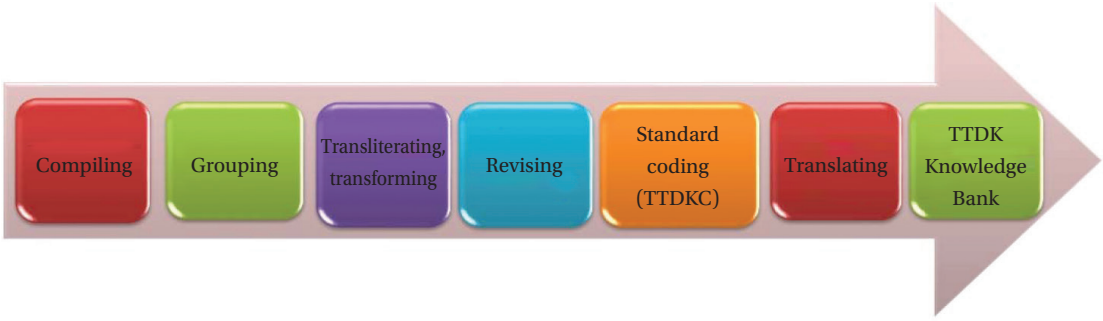


Diagram 5.2 Process for preparing digital information of Thai traditional medical knowledge



2) Knowledge compilation

This is the first step in the establishment of the TTM digital library involving the compilation of national and general ancient TTM textbooks and drug formulas, the preparation of electronic versions and getting them recorded in the database of Thai traditional and alternative medicine wisdom. Other things compiled or prepared include other references such as Monographs of Selected Thai Materia Medica, the Thai Herbal Pharmacopoeia, and photographs of TTM wisdom such as pictures of massage postures on the walls of Wat Pho, self-stretching exercise or *Ruesie Dutton* (*ruesi dadton*) postures, herbs (medicinal plants, stems, leaves, flowers, and fruits), element materials, animal materials, and others for getting recorded in the database.

Besides, importance is given to the analyses of databases of all agencies in DTAM including the databases on seven types of personnel, 1,002 herbs, TTM wisdom registration, TTM research, and others. The database on existing folk healers is also updated for use in the recording and checking of the information about indigenous medical wisdom and folk healers.

3) Knowledge grouping

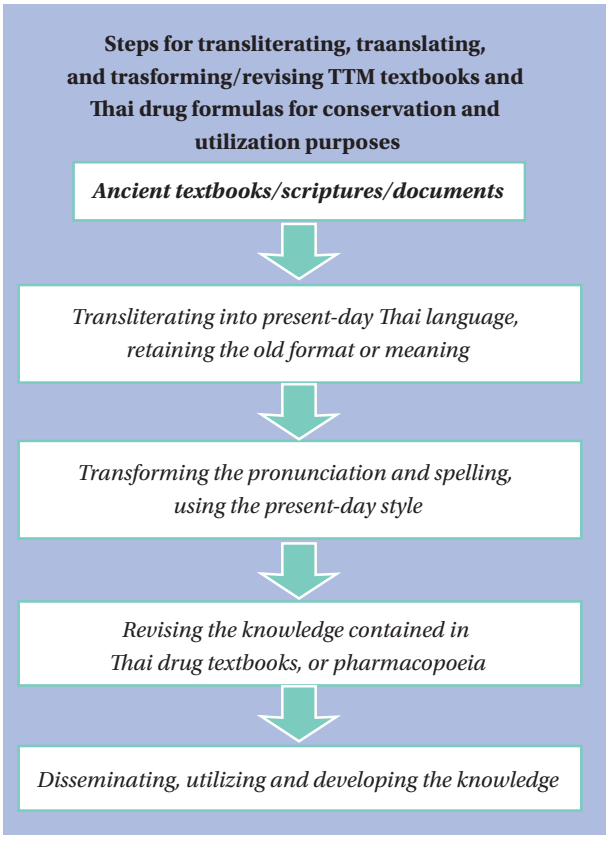
Upon completion of knowledge compilation, analyses and prioritization were undertaken on Thai drug formulas or TTM textbooks that are especially useful or valuable for the medical and health system. Importance was given to the textbooks or formulas notified by the Minister as national Thai drug formulas or national TTM textbooks. This effort also includes other commonly used textbooks and formulas that the Minister will notify as general Thai drug formulas or general TTM textbooks for use as learning references by the new generation.

4) Knowledge transliteration, translation and transformation

Transliteration, transcription or transformation means the change of ancient Thai alphabet in TTM inscriptions, scriptures or textbooks to present-day Thai alphabet, but retaining the original meaning in all aspects.

The TTM transliteration, transcription or transformation has been undertaken collaboratively by DTAM and regional educational institutions including core agencies working on traditional wisdom such as the National Library of Thailand as follows:

(1) Establishing three regional networks for transliterating, translating and transforming TTM textbooks and Thai drug formulas. That is because there are a lot of textbooks or scriptures and formulas written or scribed in different local dialects; and a model was developed for TTM/IM knowledge management for this purpose in each of the four regions: the North (Chiang Mai University; the Northeast (Mahasarakham University), the Central Plains (National Library), and the South (Thaksin University).



During that period, importance was also given to capacity building for two groups of personnel: TTM scholars to have the knowledge of ancient and local languages and language scholars to some basic TTM knowledge. The aim was to have both groups of people work together on the transliteration, translation and transformation of TTM textbooks and Thai drug formulas in each region into present-day Thai language. The outcomes were recorded and verified to ensure their accuracy before getting them fed into the digital library system.

(2) Preparing a four-year roadmap for translating TTM scriptures in two phases:

(2.1) Phase 1 during 2014–2015 focusing on the transliteration, translation and transformation of at least 40 national TTM textbooks, namely: (1) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 1, containing scriptures in 17 Thai notebooks); (2) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 2, containing scriptures in 16 Thai notebooks); (3) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 3, containing scriptures in 4 Thai notebooks); (4) Textbook of Special Medicines (*Tamra Ya Phiset*) compiled and written by HRH Prince Krom Phraya Pawaretwariyalongkorn; (5) Textbook of Medicinal Properties (*Tamra Sappakhun Ya*) of Prince Krom Luang Wongsa Dhiraj Snid; and (6) Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Phra Chetuphon (Wat Pho). Revisions were undertaken of at least two royal textbooks of medicine, or *Tamra Vejasart Chabap Luang,* namely: (1) Textbook of Thai Massage (*Khamphi Phaen Nuad*), Vol. 1, 95 pages; Vol. 2, 89 pages; and (2) Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Ratcha-orasaram, Part 3, containing 74 pictures of massage (*hatthasart)* and 80 self-stretching exercise (*Ruesie Dutton*) postures. Other related actions were the preparation and development of standard codes of TTM wisdom.

(2.2) Phase 1 during 2016–2017 focusing on the preliminary revision of national TTM textbooks, the preparation of standard codes or classification of TTM wisdom (full version), the issuance of codes for recording in the TTDKL, and the development of standard codes of indigenous medicine on a pilot scale for the country.

(3) Examples of the transliteration, translation and transformation of works on traditional Thai pharmacopoeia.

Photo 5.6 A part of Thai notebook (*samud-thai*) in Pathom Chinda Pharmacopoeia or Scripture of Medicine (*Khamphi Pathom Chinda*), Vol. 11, upper page (*na-ton*) 50



This photo shows a sample of Thai notebook (*samud-thai*) in Pathom Chinda Pharmacopoeia or Scripture of Medicine, Vol. 11, inscribed in ancient Thai alphabet with various symbols that are hard for present-day people to understand.

Photo 5.7 Transliterated words and present-day pronunciation of a portion of Thai notebook (*samud-thai*) in Pathom Chinda Pharmacopoeia or Scripture of Medicine (*Khamphi Pathom Chinda*), Vol. 11, upper page (*na-ton*) 50

คำถ่ายถอด
(หน้าต้นที่ ๕๐)

- รวมยา ๕ สิ่งนี้เอาเสมอภาค บดปั้นแท่งไว้ละลายน้ำ นมคน / ดอกไม้ ก็ได้วิเสศนักฯ
- ๏ยาแก้ต้อลำไยขนานนี้ ท่านให้เอาฝาหอยโข่ง สังข์ เบี้ยผู้ ดินถนำเอา
- สิ่งละ ๑ รวมยา ๔ สิ่งนี้เอาเสมอภาคสังสะการด้วยไม้สะแก ลิ้นทเล ๑ เข้าสาน
- ดำ ๙ เมด ภุมเสน ๖ กลำ ใบมะเฟือง ๑ ใบกะเพรา ๒

คำอ่านปัจจุบัน
(หน้าต้นที่ ๕๐)

- รวมยา ๕ สิ่งนี้เอาเสมอภาค บดปั้นแท่งไว้ละลายน้ำนมคน น้ำดอกไม้ ก็ได้วิเศษนัก ฯ
- ยาแก้ต้อลำไยขนานนี้ ท่านให้เอาฝาหอยโข่ง สังข์ เบี้ยผู้ ดินถนำเอา
- สิ่งละ ๑ บาท รวมยา ๔ สิ่งนี้เอาเสมอภาคสังสการด้วยไม้สะแก ลิ้นทะเล ๑ บาท ข้าวสาร
- ดำ ๙ เม็ด พุมเสน ๖ กลำ ใบมะเฟือง ๑ บาท ใบกะเพรา ๒ บาท

5) Knowledge revision

Thai drug textbook (pharmacopoeia) revision means the synthesis of a Thai drug textbook in such a way that the new edition's knowledge content corresponds to that of the original version, resulting from the process of interpretation, analysis and synthesis, for the book to be used for knowledge transfer and treatment purposes in the future.

The knowledge in the revision process included two categories:

5.1) Original knowledge generally containing the names of diseases, groups of symptoms and names of herbs.

5.2) New knowledge derived from the revision including the comparison of herbs' names, local/common names for the same scientific names, and interpretations by experts/specialists so that all will have the same understanding.

In addition to the textbooks to be revised, DTAM's Office of Information and Knowledge Bank has launched, on a pilot scale, the revision of the national Thai massage wisdom or knowledge as a model for revising other massage styles. In such an effort, initially the information about Thai massage textbooks was examined so that they could be used for revision. The criteria for selection are the textbooks being at least 100 years old. As of September 2016, it has been found that the texts that have been revised are the Textbook of Thai Massage (*Khamphi Phaen Nuad*), Vol. 1, 95 pages; Vol. 2, 89 pages; Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Ratcha-orasaram, Part 3, containing 74 pictures of massage (*hatthasart)* and 80 self-stretching (*Ruesie Dutton*) postures; and 40 scriptures (*khamphi*) that have been transliterated, translated and transformed, including:

(1) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 1, containing 15 scriptures

(2) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 2, containing 16 scriptures

(3) Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 3, containing 4 scriptures

(4) Textbook of Thai Pharmacy (*Tamra Phra Osoth*) of King Rama II, Vol. 3, containing 5 scriptures

(5) Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Phra Chetuphon (Wat Pho)

(6) Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Ratcha-orasaram

For the next steps, actions to be undertaken include the studies of the socio-cultural contexts in the era when the Thai massage knowledge appeared, the review of relevant literature (ancient documents, archives, dictionaries, research papers, theses, articles, and other print materials), the preparation of explanation (after the revision is finished) with the contemporary language that can be easily understood by the present-day people, and recording the knowledge in the digital system so that it will be ultimately incorporated into the digital library system.

6) Standard coding of TTDKC

The importance of the Thai Traditional Digital Knowledge Classification (TTDKC) is that it will lead to the conservation, protection and monitoring of TTM wisdom, the promotion and utilization of TTM in the health services system, extended research, people's self-care, and community economy promotion. This effort is based on the principles of classification and standard coding of TTM wisdom similar to that of the International Patent Classification (IPC).

At this stage, the creation of TTDKC has been launched, in line with the International Patent Classification (IPC), by developing a model through data collection and review of the IPC of the World Intellectual Property Organization (WIPO) for use in the classification of patents for the purpose of TTM/IM wisdom conservation and protection at the international level.

As the standard coding of TTM/IM wisdom is new to Thailand, a set of manuals for this effort has been prepared so that operating staff will understand the importance and steps for issuing standard codes.

The standard codes of TTM/IM wisdom that appear in the manuals correspond with the IPC codes. For example, Section A includes:

Class A01: Medicines for Humans
Class A02: Medicines for Animals
Class A03: Nuad Thai or Massage/Body Treatment
Class A04: Ruesie Dutton
Class A05: Leech Therapy
Class A06: Ritual Therapy
Class A07: Pant-based Materials (Based on Plant)
Class A08: Animal-based Materials (Based on Animals)
Class A09: Mineral-based Materials (Based on Minerals)
Class A10: Drug Vehicles
Class A11: Drug Preparation
Class A12: Drug Administration

The achievements of standard codes issuance for the TTM textbooks that have been preliminarily revised and the incorporation of the codes into the TTDKL as of September 2016 are as follows:

(1) Pharmacy Scripture (*Khamphi Thart*) of King Narai, palm-leaf version: 81 drug recipes or formulas, 98 kinds (*kha-nan*), composed of 976 records of plant-based materials, 36 records of animal-based materials, and 77 records of mineral-based materials, totalling 1,089 records.

(2) Illustration Book: 80 poems/postures of *Ruesie Dutton* (self-stretching exercise)

(3) Thai massage (*Phaen Nuad*) in the Inscriptions of Thai Pharmacy (*Jaruek Tamra Ya*) of Wat Ratcha-orasaram, King Rama II, Part 3, Massage (*hatthasart)*, 3 pages

(4) Textbook of Thai Massage (*Khamphi Phaen Nuad*) in the Royal Textbook of Medicine (*Tamra Vejasart Chabap Luang*) of King Rama V, Vol. 1, 44 upper pages (*na-ton*) and 10 back pages (*na-plai*)

The display can be a report on the knowledge contained in the TTM textbook, or a diagram, or a chart/picture of *Ruesie Dutton* posture with description, and an estimated age of that knowledge, see Photos 5.8 and 5.9.

Photo 5.8 Knowledge found in the *Ya-Kae-Techo-Thart* drug recipe (for relieving symptoms related to heat element) in the Pharmacy Scripture (*Khamphi Thart*) of King Narai, palm-leaf version



Photo 5.9 Knowledge found in marble inscription No. 1, Supine Massage Position, in the Textbook of Thai Massage (*Tamra Phaen Nuad Thai*) in the Inscriptions of Wat Phra Chetuphon (Wat Pho)



Photo 5.10 Knowledge found in *Ruesie Dutton* posture No. 25, Wat Phra Chetuphon (Wat Pho), and Illustration Book: *Ruesie Dutton* poems/postures, posture No. 25, for treating migraine (*lom-pra-kang*)



ตำราสมุดภาพโคลงฤๅษีดัดตน ท่าที่ 25

องค์ความรู้นี้มีอายุ ประมาณ 180 ปี

TTDKC : A04A 1/001,A04A 1/001, A04B 1/001, A04C 1/001

IPC Code : -

คำอธิบาย : ตำราสมุดภาพโคลงฤๅษีดัดตน ท่าที่ 25 รักษาอาการดัดตนแก้ลมปะกัง รัชกาลที่ 3

ภาพประกอบ

ภาพต้นฉบับ



ภาพถ่าย



บทกลอน/บทกวี

๑ กาลชฎิลดัดมล้าง	ลมดุ
ไคลขมับจับหนุ	นวดเน้น
มีนเศียรมีดจักษุ	เสื่อมสว่าง ไซ้แฮ
ไว้ฉบับบอกเส้น	ประสิทธิ์แก้ลมปะกัง

The implementation of the aforementioned activities is regarded as the beginning of the knowledge information system development that has led to the analyses and classification of knowledge, as well as the negotiations with WIPO's International Bureau. Such an effort is useful for the examination of drug formulas to see whether they are similar to those of the national formulas; and the country's digital database can be linked to the International Bureau of WIPO. In case of a violation of TTM wisdom rights, Thailand will be able to send a request for the

rejection of registration. The information system with standard codes is a tool that can be used in parallel with legal measures for Thailand to deal with the wisdom protection problems efficiently in the future. It can also be used for analyzing Thai drug formulas for extended research purposes.

7) Translation into other languages

This is an international-level activity for seamlessly linking the data to other countries all over the world. The process can be done by taking the drug formulas that have been transliterated, translated and transformed to be coded under the TTM wisdom standard coding system and get the keywords translated into foreign languages of the countries that also use the examination formats of the country's patent office and WIPO's International Bureau.

8) Digital library system or Thai Traditional Digital Knowledge Library (TTKDL)



Upon completion of all steps mentioned above, the digital TTM/IM and herb information system will be ready to be fed into the TTDKL, which is the national level TTM/IM knowledge bank. It aims is to enhance the access to the database and the protection of traditional wisdom or knowledge that has been accumulated for hundreds of years.

The management of data system of the TTDKL is divided into five subsystems, namely:

1) Herb data management (plants, animals and minerals)
2) Drug formula data management
3) Textbook data management
4) Research data management
5) Law data management

5.6.3 Conclusion

The data that DTAM will develop as a central TTM/IM digital library include two major groups: (1) traditional Thai wisdom that has been technically developed and its standard codes have been issued and (2) TTM/IM and herb data that are

collected by various agencies and have been analyzed, synthesized and developed as a single database for common use and references as per technical principles.

The digital library is an innovation for driving the digital economy and society policy through the development of a knowledge bank that can be linked to international agencies, essentially the use of standard codes for TTM/IM wisdom that is in line with those of WIPO's traditional medical knowledge. The library can be a reference for the protection, monitoring and research of TTM/IM wisdom of the country and for the conservation of such wisdom in a sustainable manner.

5.7 Lessons learned about traditional medical wisdom or knowledge protection in foreign countries

5.7.1 A case study on the sharing of benefits arising from the use of traditional medical wisdom of Kani tribe in Kerala state, India

In the forests where the Kani tribe live, garden management, education, information and training functions are undertaken by the Garden Management Division, especially herb gardens with about 1,000 species of hardwood trees, 1,500 species of herbs/odorous-spicy plants, 600 species of orchids, 60 species of bamboos, 550 species of rare/destroyed plants, 165 species of ferns, 105 species of palms, and others, totalling around 5,500 species. In addition to caring for herb gardens, the Division is providing the information about each kind of plants and has published 25 books about all plant varieties and more than 1,000 research papers as references.

1) Benefit sharing with the owners or holders of traditional medical knowledge or wisdom and herbs of the Kani tribe is regarded as the **Global Model on Access and Benefit Sharing** that has been internationally recognized. Its major points are as follows:

1.1) In 1987, scientists from Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) took a field trip to conduct a survey of the forests in the Western Ghats with a local guide from the Kani tribe. The team accidentally found the knowledge of energy boosting of the Kani by eating the seeds of a local

plant (herb) called "arogyapacha" (*Trichopodium zeylanicum* (Gaertn.) Thwaites). The herb can reduce fatigue and boost their energy while trekking the forest. Later, the JNTBGRI scientist took the herb to undergo a scientific test to prove its medicinal property.

1.2) The JNTBGRI jointly conducted a study with the Kani tribe and then filed an application for a patent of "Jeevani", the product derived from arogyapacha herb and another three extracts from other herbs. Then they entered into an agreement to promote the herb arogyapacha cultivation and buy the herb from local growers. Later, JNTBGRI and an Ayurveda drug company agreed to produce drug "Jeevani" for the market.

1.3) The fair and equitable benefit sharing between the private sector and the wisdom/herb owner at a rate of 50/50 is the concept of benefit sharing that had existed before the CBD came into effect. In this connection, a fund should be set up to manage the money received from granting the use and the royalties from the sales of the product. After the product has been marketed and it becomes popular, a higher usage fee and percentage of royalties should be received from a higher sales volume.

2) Patent registration. The JNTBGRI found that, in the USA, drugs of the same formula and property as that of JNTBGRI were registered with the USPTO. Thus, JNTBGRI in cooperation with a public sector agency of India filed a protest against the US registration; and it was successful in getting the US patent revoked. So at present, JNTBGRI has registered Jeevani in India and foreign countries.

3) Teaching/learning system of traditional medicine in India

Ayurveda College under the Department of Ayurveda, Ministry of Health and Family Welfare, is a traditional medical college of India that also provides traditional medical services to the people. It aims are to provide technical services at the international level, provide Ayurveda treatment for the Kerala people, and produce medical personnel in response to the need for Ayurveda services in the country and abroad.

Administratively, India is divided into states and each state has its own Department of Ayurveda to oversee the Ayurveda medical and health-care system, which covers more than 60% of the Indian population. So the educational system

at Ayurveda colleges has to be improved in parallel with that of modern medicine. The Ayurveda College of Kerala state offers five curricula as follows:

(1) B.A.M.S. (Bachelor of Ayurvedic Medicine and Surgery). Graduates from this programme can provide ayurvedic medical and surgical services. It is a 4.5-year programme plus 1-year practice or internship in a hospital, totalling is 5½ years, covering patient care with Ayurveda medicine, drug preparation, and Ayurveda massage.

(2) B.S.M.S. (Bachelor of Siddha Medicine and Surgery). Graduates from this programme can provide Siddha medical and surgical services. It is a 4.5-year programme plus 1-year practice or internship in a hospital, totalling is 5½ years, covering patient care with Siddha medicine, drug preparation, and Siddha massage.

(3) M.D. Ayurveda – a 3-year master's degree programme in Ayurveda.

(4) M.S. Ayurveda – a 3-year master of surgery in Ayurveda and surgery.

(5) Ph.D. – a doctoral degree programme in 15 branches.

In addition to offering Ayurveda educational programmes to the Indian people, foreign students are also accepted from other countries such as Malaysia and Uzbekistan.

The main concepts and beliefs of Ayurveda include health problems being caused by the imbalance of elements or *thart* in the body and solutions through natural means. Such concepts are applied to science and arts research on health care. In addition to teaching traditional medicine, the College also has a herb garden that produces herbal drugs for the people under the supervision of the Drug Control Department.

4) Mechanism for mobilizing Ayurveda services

4.1) The State Medicinal Plants Board of Kerala, supervised by the National Medicinal Plants Board, oversees the work of the Local Medicinal Plants Board. The Board, under the Department of Ayurveda, serves as an intermediary between herb growers and users within the state, reports to the National Medicinal Plants Board, and performs major duties as follows:

(1) Conserve herbs in-situ and ex-situ.

(2) Establish a database on herb within the locality and set priorities in using such herbs.

(3) Promote herb cultivation by providing seeds and funding for each family to grow medicinal plants.

(4) Seek markets for herbal products of the people (members) in the form of "contract farming".

(5) Promote the use of herbs, in addition to using for drug production, in daily living.

(6) Create awareness among public sector agencies and young people about herb conservation.

(7) Generate biodiversity in their designated areas and conserve it as much as possible according to the CBD.

Achievements in recent years: (1) Setting up herb learning gardens that grow about 1,200 species of herbs and supporting each city to grow their own garden. To date three out of 14 cities in Kerala have had their own gardens. (2) Organizing meetings and exhibitions on herbal use promotion in the state. To day it is undertaking the "National Amla Mission" to promote the production and use of Indian gooseberry or *ma-kham-pom* (*Phyllanthus emblica*), which is the most widely used herb in the country. The herb is used as medicine and mixed with other fruit juices to produce several mixed fruit juices of several tastes and properties. (3) Taking responsibility for encouraging each family to grow their own herb garden, using a list of 50 herbs with the government funding subsidies.

Besides, there is a recommendation for promoting herbal product industry, i.e. state agencies have to serve as an intermediary to seek markets for herb growers and play a matching role among those involved in the "demand and supply" sides of herbs.

4.2) Kerala State Biodiversity Board. Working under the National Biodiversity Board, the Board oversees the work of the Local Biodiversity Management Committee, which undertakes duties as per the 2002 Biodiversity Act of India and the 2005 Convention on Biodiversity. Its aim is to conserve biodiversity at the local level in coordination with the State Medicinal Plants Board; and its major duty is to prepare a database on all diverse living things in the designated areas of Kerala's 14 districts, including the knowledge used in the past until today and geographic conditions by experts in each branch. They also prepared reference documents

showing “prior art” related to genetic resources that are linked to national wisdom for use in preventing right-violation and bio-piracy. Over the past 8 years, 1,043 reference documents have been prepared with funding from the State Government of Kerala; and this effort continues to be undertaken. Moreover, a seeds bank has been operated in cooperation with JNTBGRI.

5.7.2 Meeting of the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources Traditional Knowledge and Folklore (WIPO IGC)

DTAM has been taking actions on the protection of TTM wisdom and herbs as well as their origins by law in line with the legal system or international agreements under WIPO’s Convention on Biodiversity (CBD) and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD. DTAM officials also participated in the WIPO IGC 30, held on 30 May–3 June 2016 at the WIPO office in Geneva, Switzerland. At the meeting, discussions were held on the negotiation framework for creating international legal tools for traditional knowledge protection in each country in three areas: (1) genetic resources, (2) expressions of traditional cultures of the communities, and (3) local wisdom protection.

Major points discussed/agreed to at the WIPO IGC 30:

(1) Consideration of draft guidelines for the protection of genetic resources, concerning:

1.1) Mandatory disclosure of origin

1.2) Development of a genetic resource (GR) database

1.3) Development and preparation of the registry of traditional knowledge

1.4) Conditions for the access to genetic resources

(2) Summary of Thailand’s position derived from the Thai delegation’s preliminary meeting on International Legal Instruments for the three aspects of protection – agreeing to the aforementioned principles:

2.1) Mandatory disclosure of origin when the resources are asked to be used.

2.2) Prevention of misappropriation of resources.

2.3) Taking parallel actions within the country concerning the revision of relevant laws that may impede the operations, and establishing a database or registry of genetic resources and local wisdom covering their origins in line with relevant international laws or agreements.

3) Results of the meeting on the texts of the four major issues: (1) Policy objectives, (2) Subject matters of instruments, (3) Mandatory disclosure, and (4) Misappropriation.

4) Results of the meeting on legal instruments for international IP protection during the first stage, mandatory disclosure of origin, access to resources when permission is asked, misappropriation protection, and the definitions – agreements could not be reached by developed and developing countries. So a joint solution has to be sought.

5) The consideration by members of the two groups of countries was made on the shared texts derived from the consolidated texts (WIPO/GRTKF/IC/30/4) from the 29th meeting. At this meeting, on the shared texts (Rev. 1), different opinions and propositions in principle were clearly voiced by developed countries such as the USA, Australia, Canada, etc., placing an emphasis on:

5.1) The protection of genetic resources in the patent form, i.e. the patent will protect inventions, products, and processes with a different way, compared with that for other kinds of protection, as they would face tougher steps. For an innovation to get patented, it has to meet the criteria of (1) being new, (2) having innovative steps, and (3) having industrial application, except that certain types of invention may not get any protection, such as plants, bio-processes, discoveries, etc. For such items, their origins of resources and knowledge are not required to be disclosed, but support is provided for the development of their database to enhance data accessibility.

5.2) In the case of genetic resources protection, according to the intent of the negotiation, all member states are required to disclose the origins of resources and knowledge they have acquired. If an access is requested, a prior informed consent (PIC) has to be obtained from the individual owner and the community, or the country of origin. This is to prevent any violation or misuse or misappropriation of resources. And the important intention is to move towards

the measures and procedures for the negotiation and sharing of benefits with the owners according to the CBD and the Nagoya Protocol, as well as the intention of most developing countries including Thailand

6) In conclusion, on the last day of the negotiation meeting, most of the 188 member states resolved at the plenary discussion session to agree in principle to all 11 Genetic Resources Texts that have been classified as:

(1) List of terms (scope, definitions, vocabulary)

(2) Preamble (preface)

(3) General provisions (objectives and essence)

(4) Mandatory disclosure (criteria for disclosure of origin, exceptions, limitations, permission, procedures)

(5) No new disclosure requirement (alternative to articles 1–5)

(6) Defensive measures or defensive measures complementary to mandatory disclosure (examination, analysis, status assessment, steps for preventing errors, patent application, and ethics, regulations and voluntary practices)

(7) Final provisions (relationships or consistency with international laws or agreements, border crossing, technical methods, assistance and capacity building)

In this regard, the WIPO will present this paper to the WIPO General Assembly to be held in September 2017 and will also ask for an extension of the WIPO IGC's mandate.

7) As the WIPO IGC meeting is directly related to TTM wisdom protection under the responsibility of DTAM, whose roles include: (1) being a representative of all relevant agencies and performing the duties prescribed in the TTM wisdom protection law; (2) being a member of the Thai delegation to attend the meeting as per WIPO IGC's mandate. Its recommendations related to the acceptance of the Genetic Resources Texts are the following:

7.1) Accelerate the revision of law related to the TTM wisdom protection and promotion in response to the mechanism proposed in the draft generic resources texts.

(1) In the chapter on TTM dealing with Thai drug formulas and TTM textbooks, the origins of herbs and the types of formulas and textbooks are to be indicated as to whether they belong to a juristic person or a community to

retain the "prior art" of traditional wisdom and prevent any violation or stealing that may occur in the future, and to respond to the policy on Trans-Pacific Partnership (TPP).

(2) In the chapter on the protection of herbs and their origins, there should be a provision on the establishment or development of a database on herbs and related genetic resources including their origins in response to the practical guidelines for getting access to genetic resources and benefit sharing. This will lead to the protection of TTM wisdom of individuals and communities as well as other relevant intellectual property.

7.2) Develop the database of herbs, origins and relevant genetic resources in line with the GR texts in an efficient manner by studying, exchanging and learning from the Bureau of Plant Varieties Protection of the Department of Agriculture, which has developed a plant genetic database using an online internationalization system, linking to the patent offices in other countries, especially WIPO, USPTO and JPO. This is for use in the examination of patent application and the suppression of the violation of TTM/IM wisdom, herbs and relevant genetic resources.

7.3) Promote the creation of knowledge and communication mechanisms for better understanding among regional/provincial partners, especially the Provincial Registrars, provincial expert members who are selected as provincial representatives, and stakeholders at the local level.

5.8 Discussion, conclusion and recommendations

The implementation of the TTM knowledge or wisdom protection system under the TTM wisdom protection and promotion law over the past 16 years has not been satisfactory. That is due to a number of obstacles, conditions and constraints in terms of management system, policy and resource support, especially the limited roles and capacity of the TTM Knowledge Protection and Promotion Committee. The capacity of the committee is still insufficient despite the availability of budget from the TTM Knowledge Fund, which is a more outstanding feature compared with the mechanisms under other laws. It has a decentralization system for designating

the Provincial Pubic Health Office in each province as the Provincial Registrar's Office. But their performance or outputs are not efficient and effective enough to respond to the needs of the nation and the people as expected.

However, despite the aforementioned conditions and constraints, there are partners from all sectors coming in to think and work together and support the efforts continuously. That is an outstanding feature with a positive effect in driving the protection programme forwards in an integrated manner; coupled with the legal mechanism within the country, the work has moved steadily ahead.

Based on the aforementioned background, context and reason, the tropical climate has made Thailand become one of the countries with genetic resources and TTM wisdom and abundant medicinal plants or herbs of about 10,000 species. Even though Thailand has had the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, for over 16 years, no single item of TTM wisdom or knowledge has been protected under the law. This might be due to unclear guidelines to practise under the law in a developing country.

So there has been an effort to seek a legal measure to protect the nation's TTM wisdom. That is a thought property and procedures that have been passed down from the ancestors for a long time. The wisdom protection aims to prevent developed countries from exploiting Thailand's knowledge without paying any compensation. Moreover, some developed countries think that the knowledge belongs to humanity or is a public domain. So the idea about wisdom protection is still being debated at international organizations and at the national level.

And because TTM wisdom and genetic resources are regarded as intellectual property; so they are valuable assets of the country and industrialized countries are trying to seek and have access to such assets for commercial purposes. The new era of colonization has arisen, i.e. the colonization of biodiversity and local wisdom, for example:

1) The case of study of turmeric (*khaminchan*) patent. In 1995, the USPTO issued a patent on the invention of turmeric for wound healing to the University of Mississippi. The patent instigated a lot of arguments and later on the Council of Scientific and Industrial Research of India filed an application for patent revocation on the grounds that turmeric had been used as a wound astringent and for relieving

skin irritation or atopic dermatitis for a long time as recorded in Sanskrit and English and published in the journal of the Council of Scientific and Industrial Research of India. So it was regarded that the knowledge of turmeric use was India'a local medical knowledge or wisdom. With such evidence and records, the USPTO decided to revoke the patent due to the invention's lack of novelty.

2) The case study of rice variety with bacteria blight-resistance gene. In Mali, the patent of blight-resistant rice caused a lot of arguments about the sharing of benefits arising from the use of patented rice with the Malian rice farmers, who conserved rice "*Oryza longistaminata* A.Chev.&Roehr". The University of California, the patent holder, responded by sharing the benefits arising from the commercial use of the patent with the Genetic Resources Recognition Fund (GRRF). Besides, research and development (R&D) of a new rice strain is allowed. This case study may not be regarded as a real bio-piracy or IP violation, but it is an example of a response to the aforementioned mechanism.

3) The case study of patenting neem (*sa-dao* or *Azadirachta indica* A.Juss) invention. An NGO of India filed an application to the European Patent Office for revocation of the patent on a fungal control invention using neem oil. In 2000, the patent was revoked for its lack of novelty. Neem has actually been widely used as a medicinal herb, insecticide, fungicide and fertilizer, and regarded as local knowledge of India.

4) The case of Thai croton, *or plao-noi* (*Croton sublyratus* Kurz). Japan through an education assistance project, in cooperation with public and private sector agencies, tried to find a herbal extract by using a lot of plant samples for their experiments, which were time-consuming with high costs. But when Thais provided them with the information about Thai medicinal plant *plao-noi*, their study could be completed and yield the result within a short period of time. Having considered the use of Thai croton in Thailand, the Japanese action was regarded as bio-piracy as they directly obtained the Thai croton samples from a sales agent in Thailand without government permission. Upon their patent registration and commercial production of the product, there was no equitable benefit-sharing with the country that actually owned the genetic resources. Thus, Thailand has lost an opportunity to further develop any production process or products that have been patented in Japan.

5) The case of *kwao-khruea* (*Pueraria candollei*) patent. In this case, a piece of Thai people's knowledge or wisdom was taken for further study with a modern scientific and technological method and got the result patented for commercial production without any equitable benefit-sharing with Thailand. The raw material in this case was *kwao-khruea*, whose origin was Thailand and Thai researchers involved did not ask permission required by law. That was because the Thai government agency responsible for this matter could not take any action efficiently due to a lack of personnel and budget. As a result, Thailand has lost an opportunity to undertake any extended research on the herb and lost the right to produce any related products for sales in many countries such as Japan, Korea, the USA, and others.

6) The case of *Ruesie Dutton* (self-stretching exercise) of Thailand. This case happened when a Japanese businessman, who had completed his Thai massage and *Ruesie Dutton* training at Wat Phra Chetuphon (Wat Pho), opened his Thai massage, spa and yoga business in Japan and applied for registration of his trademark "Ruesie Dutton". In addition, he applied for registration of more than 50 other products. Finally, Thailand filed an objection with the Japan Patent Office for revocation of the trademark registration, citing documents as evidence and stone inscriptions of Wat Phra Chetuphon.

Besides, many items of traditional medical knowledge in various countries have been threatened and exploited by a number of drug companies in developed countries. The group of least-developed and developing countries have accused such developed countries of taking their knowledge for further R&D and then applying for drug patents. With such protection, their actions are regarded as bio-piracy, which is a serious accusation for developed countries. This is evident in the applications for revocation of patents in Europe and the USA, such as the cases of neem, turmeric, ayahuasca, and *kwao-khruea*.

The aforementioned case studies are regarded as "bio-piracy of local wisdom" as Thailand is a country having abundant biological resources and local wisdom, and the exploitation of such resources and wisdom is widespread across the globe. In the future, the forms of such access will be more numerous and complex. Thus, it is necessary to create a policy mechanism for such a matter and the country's position to respond to legal measures and agreements that will

occur. Its aim is to establish and maintain balance, fairness and equality in society regarding natural resources and local wisdom for the future.

The movement for TTM wisdom protection is linked to, and corresponds to, many international laws, based on five principle, namely (1) community participation, (2) prior informed consent, (3) fair and equitable benefit-sharing, (4) sustainable development, and (5) respect and recognition of wisdom and communities/owners. These principles are used as a guide for setting policy and strategies for TTM wisdom protection so that Thai policies and laws are in line with international principles and Thailand's commitments under international agreements.

These principles are also in line with the negotiation frameworks of the WIPO IGC for 2016–2017. In this regard the Thai cabinet has agreed in principle to the mechanisms and systems for TTM wisdom protection under relevant Thai laws as follows:

1) For genetic resources, the major issue of concern is the disclosure of the source or origin of the genetic resources that are used in the intellectual property. As Thailand has abundant biodiversity and valuable herbs in all regions of the country, the blocking of information would be difficult to do. But the disclosure of the origin and reference of the wisdom when using such genetic resources would be useful for the management or negotiations on benefit-sharing in a concrete manner.

2) For local wisdom or knowledge, the 1999 TTM Knowledge Protection Act divides TTM knowledge or wisdom into 3 categories: (1) national Thai drug formulas or TTM textbooks, (2) general Thai drug formulas or TTM textbooks, and (3) personal Thai drug formulas or TTM textbooks. The levels of protection are dependent on the type of wisdom; for personal Thai drug formulas or TTM textbooks, the right to the wisdom is vested in the right-owners for their lifetime and for another 50 years after the death of the last right-holder. After that the wisdom will be in the public domain, which is different from the patent system that gives the protection for only 10–20 years.

3) For traditional cultural expressions (TCEs), they are overlapping largely with TTM wisdom; and parts of TTM wisdom have been notified as national cultural wisdom. And there have been concerns that the protection of both aspects would be overlapping each other, but the intent is for both to promote and support each

other in maintaining their existence. However, TTM wisdom may be extended further to become products and services in the health-care or economic systems of the country.

At ASEAN forums, for driving the intellectual property strategy, member states have drawn up a 20-Year IP Roadmap: IP-Driven to Innovation-Driven. The Roadmap will help Thailand to advance further in terms of systems for innovation creation, utilization, and respect/recognition. Under the draft Roadmap, Thailand aims to become a developed country with stability, prosperity and sustainability within the next 20 years. The focus is on the commercial use of intellectual property in four phases. However, as the MoPH is the user of IP-related innovation products and also plays a role as a product controller to protect and safeguard the health of the people who are end-users, it has the following opinions about the Roadmap:

1) The conceptual framework for IP Enforcement, IP Creation, IP Protection and IP Commercialization should incorporate the promotion of IP utilization by the entire society. This should include technology transfer and utilization after the IP protection or sole rights period has expired. That is because the WTO's trade agreement principles are the model of international agreements adopted by Thailand, which has amended its laws in line with such principles. The protection is intended to give "private right", "public interest", and "technology transfer" from IP holders, especially patent holders. Thus, this roadmap should incorporate the promotion of balance.

2) Creation

2.1) Creation of extended knowledge based on the old patent and working on another R&D project to obtain another piece of knowledge for registering a new patent; and using the knowledge from the expired patent for commercial production of SMEs.

2.2) Access to the information of expired patents and making use of such knowledge for Thai SMEs.

2.3) Setting a clear target regarding the number of new patent applications per population; and the target should be the proportion of Thai patent holders, not just the total number. Besides, there should be two types of patents: inventions and designs.

2.4) Developing a "roadmap" for a specific group of products such as medical products (medicines, vaccines, biological products and medical technologies) because they are regarded as one of the four basic necessities of life. They are different from other groups in many aspects such as R&D process and commercial utilization that are complicated. Besides, at present, over 90% of applications and patents belong to foreigners.

3) The roadmap for the protection and utilization of Traditional Knowledge and Genetic Resources (TK & GRs). Intellectual property also covers TK & GRs, which are the origins of resources, biodiversity and patents. Actions should be expedited for the registration and protection of plant varieties and biodiversity, the development Thai database of intellectual property, and the creation of measures and mechanisms for equitable benefit-sharing by such responsible agencies as the Department of Intellectual Property, the DTAM, the Department of Agriculture, and the Ministry of Natural Resources and Environment.

Therefore, in connection with the system for protecting Thai traditional medical knowledge and genetic resources related to Thai and international laws and agreements, the policy and management recommendations on such matter in the future as follows:

1) The redirection and system development for protecting Thai traditional medical knowledge or related genetic resources is regarded as an urgent national agenda. Such an effort includes the amendment of certain provisions of the TTM wisdom protection and promotion law that deal with the mandatory disclosure of herb origins and the specification of the sources, owners or possessors of Thai drug formulas and TTM textbooks so that they can be linked to the claim of personal and community rights, in line with the WIPO IGC negotiation framework. This is also related to the endorsement of the operational mechanism under Article 8j of the Convention on Biodiversity, the Nagoya Protocol and the Convention for the Safeguarding of the Intangible Cultural Heritage.

2) The revision of the component of the TTM Wisdom Protection and Promotion Committee, as a national committee, to answer the questions related to strategies and outcomes in an efficient manner.

3) The acceleration of the establishment of all four regional databases of genetic resources and local wisdom in all aspects with the linkages to the use of

indigenous medicine, the expression of ownership, the creation of Prior Art System, in response to the entry as a partner of the Trans-Pacific Partnership (TPP), and the regional or international laws or agreements in the future.

4) The urgent search for measures and guidelines for generating knowledge, facts and understanding of relevant domestic and international laws and agreements for the popular sector as appropriate, and cooperating with the civil society in such movements.

5) The designation of conditions and rules for preventing the stealing or exploitation of traditional medical knowledge and genetic resources, conducting research, technical cooperation among agencies within the country and abroad, and further study overseas.

6) The establishment of measures for responding to the reciprocity principle under the General Agreement on Tariffs and Trade (GATT) of the World Trade Organization (WTO), which is related to, and has an effect on, the operation under Section 43 of Thailand's 1999 TTM Knowledge Protection Act.

Chapter

6

International Cooperation on Traditional, Indigenous and Alternative Medicine

Thailand, through the Department of Thai Traditional and Alternative Medicine (DTAM), has been playing a key role in promoting international cooperation for traditional medicine (TM), indigenous medicine (IM) and alternative Medicine (AM), particularly under the ASEAN framework with formal development cooperation efforts having been undertaken since 2009. Besides, Thailand has been actively involved in activities under other cooperating mechanisms such as the Asia-Pacific Economic Cooperation (APEC), the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), the cooperation on indigenous medicine in the Greater Mekong Subregion (GMS), the cooperation with the World Health Organization (WHO), and bilateral cooperation with several countries such as India, Bhutan, Myanmar, and China

6.1 Cooperation on traditional medicine in ASEAN

Thailand has been playing a key role in promoting international cooperation on traditional medicine by serving as the lead country in promoting the use traditional medicine in primary health care in ASEAN member countries. During 2014–2016, three activities were undertaken among several member countries, namely the promotion of traditional medicine in primary health care programmes,

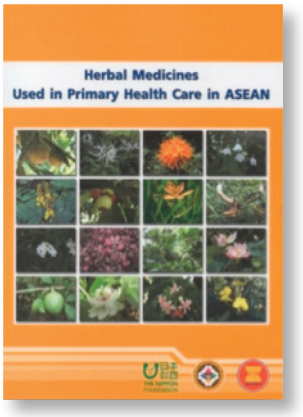
the strengthening of cooperation on traditional medicine in ASEAN, and the China-ASEAN development cooperation.

6.1.1 Preparing books for promoting traditional medicine in primary health care in ASEAN

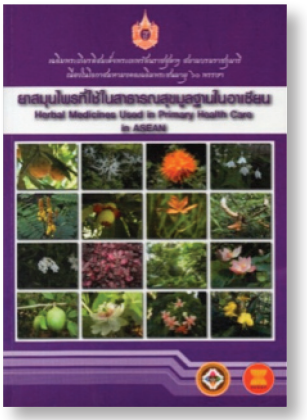


The ASEAN Task Force on Traditional Medicine (ATFTM) has been set up to support the cooperation on traditional medicine, complementary and alternative medicine (TM/CAM) as specified in the ASEAN Socio-Cultural Community (ASCC) Blueprint and discussed/monitored in the Senior Officials Meeting on Health Development (SOMHD).

The ATFTM workplan focuses on actions aimed at achieving strategic objective B.4 (section 22, actions vii and xviii) of the ASCC Blueprint 2009, which promotes the integration of safe, effective and quality traditional and alternative medicine (TM/AM) into the national health-care system, and empowers consumers to make informed choices of TM/AM products or services. The cooperation in this connection covers five areas, each under the responsibility of each Lead Country.



Thailand, as the lead country in charge of promoting the use of traditional medicine in primary health care, hold two workshops to prepare a book on "Herbal Medicines Used in Primary Health Care in ASEAN" and got it printed in 2014. The book was launched at the 12th ASEAN Health Ministers Meeting (AHMM) in Hanoi, Vietnam, in the same year.



The book "Herbal Medicines Used in Primary Health Care in ASEAN" is intended for the general public





Photos 6.1 and 6.2 Workshops 1 and 2 to prepare a book on "Traditional Medicine Self-Care in ASEAN" in 2015 and 206, respectively

and health personnel in ASEAN to use 65 medicinal herbs selected from all ASEAN member countries for use in treating 27 non-serious symptoms or illnesses. According to the ATFTM workplan, the ASEAN member countries that do not use English as official language plan to translate the book into their own language so that their people will have easy access to such information. As for Thailand, the Thai version of the book was printed in 2015; and its copies have been distributed to more than 100 TTM partners including relevant universities and hospitals.

In connection with the success in preparing and printing the book "Herbal Medicines Used in Primary Health Care in ASEAN" to promote ASEAN people's use of traditional and alternative medicine for self-healthcare, during 2015–2016, Thailand hosted another two workshops to prepare another book on "Traditional Medicine Self-Care in ASEAN". The aim is to encourage the people in ASEAN to use traditional and alternative medicine for self-care.

6.1.2 Strengthening coordination on traditional medicine in ASEAN

The coordination in this effort began in a concrete manner in 2009 when Thailand initiated the ASEAN Conference on Traditional Medicine with funding support from the TTM Knowledge Fund and the Nippon Foundation. In the following years, member states take turn hosting the conference in conjunction with the ATFTM meeting. The aim is to share the knowledge and research papers

on TM/AM and follow up on the cooperating activities as per the ATFTM annual plan of action.

During 2014–2016, there were changes in the ASEAN health meeting arrangements – health priorities were selected and the task forces under SOMHD were to be under the supervision of four "Health Clusters", all reporting to SOMHD. That was to reduce the number of meetings and performance reports to be presented at the SOMHD, so that it would play a bigger role in policy issues. DTAM sent its representatives to attend the SOMHD Work Group Meeting on ASEAN Post-2015 Health Development Agenda to discuss new ASEAN health operating mechanisms after 2015. At the meeting, DTAM's representatives proposed that traditional medicine be included in the health issues so that cooperation with all member states can be discussed. Finally, traditional medicine was accepted as 1 of 20 health issues and was placed under Health Cluster 3: Strengthening health system and access to care from 2016 onwards.

In March 2015, Thailand proposed to host an ATFTM Post-2015 Planning Meeting for member states to discuss and draft goals/targets and regional strategy for traditional medicine in response to the change in the working groups' operating mechanisms after 2016. Later on in July 2016, during a meeting to prepare the book "Traditional Medicine Self-Care in ASEAN" in Thailand, an extra session was held to discuss some activities in the ATFTM action plan for the future that would be presented at a meeting of Health Cluster 3: Strengthening health system and access to care in Manila of the Philippines. In the same month, Thailand's coordinator on traditional medicine attended the meeting and joined other coordinators of other working groups in the same cluster in setting the scope of the strategic and cooperation plans for the future.



6.1.3 Development of ASEAN-China cooperation

All 10 ASEAN member states and the People's Republic of China have signed a memorandum of understanding on health cooperation including traditional medicine. The action plan for traditional and alternative medicine, 2014–2018, focuses on the development and promotion of TM personnel, information/knowledge sharing, research and development, traditional medicine development, integrative TM/Health services, and TM services in universal health coverage.

In 2015, China organized the China-ASEAN Traditional Medicine and Health Tourism International Forum (Bama Forum) in Nanning and the 16th International Conference of Traditional Medicine in Yulin, both in Guangxi Zhuang Autonomous Region, which were attended by representatives of all ASEAN member states, including Thailand, as well as China. The meetings agreed to set up an ASEAN-China Exchange and Cooperation Center of Traditional Medicine for all concerned parties to exchange the information and knowledge of traditional medicine.

Later on in 2016, China invited ASEAN representatives to attend the "2016 China-ASEAN Traditional Medicine (TM) Training Program & Field Study on Disease Prevention and Treatment – Integrating TM into the National Health Care System (Phase 2)", held from 20–24 June 2016 at Guanganmen Hospital in Beijing. So representatives form DTAM of Thailand had an opportunity to participate and gain experience and knowledge from the event in the following aspects:

(1) Integration of traditional Chinese medicine (TCM) in the care, prevention and treatment of diseases with the modern medicine system, which can be run together and acceptable to modern medical doctors, chinese medicine doctors and the people with support from local governments.

(2) Development of medical equipment based on the TCM principles or theory that is applicable in practice in the health-care system.

(3) Research studies on TCM using modern research methodologies to prove TCM treatment outcomes.

(4) Development of the TCM drug models to enhance the convenience in their utilization, storage and efficacies and improve patients' quality of life.

(5) Development of health-care facilities, including clinics and hospitals, to provide Thai traditional medical services to ensure their reliability, convenience, safety, effectiveness and quality for health tourists.

6.2 Cooperation on traditional medicine under BIMSTEC framework

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) was established to promote economic and social cooperation among seven member states: Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand.

As for health cooperation, Thailand has been designated by the group as the Lead Country on public health, particularly traditional medicine. In this regard, the group has set up a Network of National Centers of Coordination in Traditional Medicine; and Thailand hosted two meetings of the Network in 2003 and 2010 to establish guidelines for cooperation on various activities related to traditional medicine in all member states.

As Thailand is the Lead Country on BIMSTEC's health cooperation and DTAM is the Secretariat of the Network of National Centers of Coordination in Traditional Medicine, DTAM held the 3rd BIMSTEC Meeting on the Network of National Centers of Coordination in Traditional Medicine on 20–22 July 2015 with the BIMSTEC Secretariat (established in 2014) serving as the meeting's secretary for the first time. The meeting aimed to push for the implementation of various activities under the BIMSTEC cooperation framework in a concrete manner and for traditional medicine to play a more active role in people's health care in its member states.

The above-mentioned meeting passed a resolution to formally set up the "BIMSTEC Task Force on Traditional Medicine (BTFTM), the BIMSTEC Network of National Centers of Coordination in Traditional Medicine (BNNCTM) and a Plan for Traditional Medicine Cooperation covering four areas as follows:

(1) Practice and service system

(2) Traditional medicine practitioners

(3) Traditional medicine products

(4) Protection of genetic resources and associated traditional knowledge



Photo 6.3 Third BIMSTEC Meeting on the Network of National Centers of Coordination in Traditional Medicine, Thailand

6.3 Cooperation on traditional and indigenous medicine in the GMS

The establishment of a Network of Indigenous Medicine in the Greater Mekong Subregion (GMS) was initiated by the Network of Folk Healers in Northern Thailand and the network of folk healers in the upper Mekong basin, including Sipsong Panna (Xishuangbanna in China), Tai Yai (in Shan state, Myanmar), and Lao Lan Xang (in Laos). The network agreed to hold a regular meeting or forum for knowledge sharing by taking turn hosting it. That was the beginning of the First Meeting on Indigenous Medicine Research and Development in the Mekong basin.

In 2015, DTAM and the Faculty of Medicine of Mahasarakham University hosted the 7th Meeting on Indigenous Medicine in the Greater Mekong Basin under the theme of "one community toward a sustainable region" at the IMPACT Exhibition and Convention Center in Muang Thong Thani, Nonthaburi, on 1–3 September 2015, and the International Conference on Traditional and Indigenous Medicine on 4–5 September 2015 at the same venue. That was the beginning of the effort for technical cooperation on this matter; and representatives of ASEAN member states were also invited to take part in the conference. The aims were also to strengthen

and broaden the network for cooperation on traditional and alternative medicine in the entire ASEAN region.

At the 7th Meeting on Network of Indigenous Medicine in the Greater Mekong Basin, the Collaborative Network of Indigenous Medicine in the Greater Mekong Subregion, the Academic Committee of the Network, and the Core Committee on the Protection of Traditional Medical Knowledge and Medicinal Genetic Resources held a consultation on the action plan for cooperation on indigenous medicine for 2016–2020, which specified activities under the following three strategies:

(1) Development of indigenous medicine practice and service in the health-care system

(2) Capacity building for indigenous medicine practitioners and researchers

(3) Protection of traditional and indigenous medicine knowledge, intellectual properties related to TM/IM, and associated genetic resources

Under the action plan for international cooperation on indigenous medicine, 2016–2020, China as the lead country in implementing the strategy on indigenous medical services and integration in the health-care system has strengthened the technical capacities under the Academic Committee of the Network of Indigenous Medicine in the GMS. In this effort, the First Academic Forum on Traditional Medicine in the Lancang-Mekong River Basin was held on 18–19 September 2016 in Kunming, Yunnan province of China. Participating in the meeting were representatives from DTAM and the GMS Academic Committee of the Network of Indigenous Medicine; and presentations as well as discussions were held on research results in the GMS on this matter, steps and process for treating diseases, TM/IM wisdom protection, and indigenous botanical research.

On the above-mentioned trip to Kunming, the Thai delegation also had an opportunity to take part in the 1st International Conference on the Development of Wa Medicine on 21–22 September 2016 in Lincang city of China's Yunnan province; that meeting was held back to back with the Kunming meeting. At that meeting the Thai participants could learn about indigenous medicine wisdom of the Wa ethnicity and exchange experiences and cultures with other GMS network members.



Photos 6.4–6.8 Seventh Meeting on Indigenous Medicine in the Greater Mekong Basin and International Conference on Traditional and Indigenous Medicine, 2015







Photos 6.9–6.11 First Academic Forum on Traditional Medicine in the Lancang-Mekong River Basin and First International Conference on the Development of Wa Medicine, 2016

6.4 Cooperation in herbal medicine database development under APEC

From Thailand, the director of the Office of Information and Knowledge Bank, DTAM MoPH, participated in the "**APEC Workshop on the Development of Herbal Medicine Database in Asia-Pacific Region**", held on 28–29 June 2016 at the Hotel Jen Manila, Pasay City, Philippines, together with participants from seven other countries: China, Russia, Mexico, Peru, Indonesia, Malaysia and the Philippines.

Its aim was to establish a herbal medicine (drug) database at the regional (APEC) level as each member state's database has a different level of development regarding content, search method, and language. The Asia-Pacific region is an important centre of traditional medicine where a lot of indigenous people are still using herbal drugs; and many research papers on herbal drugs are the basis for herbal drug formula development in herbal drug markets. The workshop was divided into three small groups to meet and design work plans on the following matters:

(1) Research collaboration – Indonesia, group secretary

(2) Research and information network – Malaysia, group secretary

(3) Herbal medicine database/search portal – Philippines, group secretary

The meeting also prepared a "Draft Manifesto" on the development of herbal medicine database of the region for submission to the APEC-PPSTI to call on APEC member states that wish to participate in this effort to assign a network coordinator and working group members, and make funding contribution to support the network operations. The APEC Herbal Medicine Research and Information Network (AHMeN) will work under the APEC-PPSTI with the aim of helping everybody to get access to good health data, preventing the violation of biological copyrights, conserving traditional knowledge, sharing benefits from research, reducing research redundancies, increasing research efficiency, promoting cooperation and enhancing easy access by relevant agencies.

6.5 Cooperation on traditional medicine with WHO

WHO Traditional Medicine Strategy 2014–2023

Thailand is one of the countries that have been recognized by the World Health Organization (WHO) regarding the integration of traditional medicine into the national health-care system. Representatives from Thailand were thus invited to take part in the preparation of WHO's 10-year strategic plan for traditional medicine. Thai representatives, Dr. Supachai Kunaratanapruk and Adjunct Asst. Prof. Dr. Thavatchai Kamoltham, were invited to attend the launch of the WHO Traditional Medicine Strategy 2014–2023 during the WHO High-Level Meeting on

the Implementation of WHO Traditional Medicine Strategy, 2014–2023, in China's Macau Special Administrative Region, on 28–30 October 2013.

The beginning of getting the first WHO Collaborating Centre for Traditional Medicine (WCCTM) designated in Thailand

It was during the above-mentioned meeting, Dr. Zhang Qi, WHO Traditional Medicine Coordinator, proposed that Thailand should get a traditional medicine (TM) institution (educational, research or hospital) with suitable/capable physical facilities, personnel and funding capacities designated as a WCCTM. The designation period would take about 3 years, involving the illustration of collaborative efforts with WHO, the assessment of the centre's capacity, the preparation of a TM technical paper (i.e. WHO Benchmark for Practice in Thai Massage or Nuad Thai), the co-hosting of an international meeting, and joint technical cooperation and research. To date, Vietnam is the only country in ASEAN that has got its National Hospital of Traditional Medicine in Hanoi designated as a WCCTM.

To pursue the above proposition, on 31 March 2015, Adjunct Asst. Prof. Dr. Thavatchai Kamoltham, the then director-general of DTAM, had a meeting with the Faculty of Medicine Siriraj Hospital led by Prof. Dr. Suwannee Suraseranivongse, deputy dean of the Faculty, and WHO officials including Dr. Yonas Tegegn



Photo 6.12 Tripartite meeting of officials from the Department of Thai Traditional and Alternative Medicine, the Faculty of Medicine Siriraj Hospital, and the World Health Organization

(WHO Representative to Thailand), Dr. Zhang Qi (WHO TM Coordinator, WHO Headquarters), and Dr. Kim Sung-chol (WHO TM Coordinator, WHO/SEARO), to lay down plans to get the Center of Applied Thai Traditional Medicine at the Faculty of Medicine Siriraj Hospital, which was ready in terms of premises and personnel, as a TTM educational, service and research institution to collaborate with WHO as a first WCCTM in Thailand. In this connection, DTAM would support and coordinate towards the desired achievement. This would raise the TTM system to be globally recognized as a TM system; and the close collaboration with WHO would be beneficial for further development of Thai traditional medicine.

Experience sharing in integrating traditional medicine into national health-care system among WHO/SEAR member states for monitoring and evaluation of TM services

In 2015, DTAM sent three delegates including directors of the Institute of Thai Traditional Medicine, the Office of International Cooperation, and the Thai Traditional Medicine Research Institute to attend the WHO/SEARO Regional Workshop to share experiences and evidence on "Appropriate Integration of Traditional Medicine into National Health Care Systems", on 19–23 October 2015, in Pyongyang, Democratic People's Republic of Korea (DPRK or North Korea). The workshop aimed to (1) review the current experience and evidence in the integration of traditional medicine into national health-care systems of WHO/SEAR member states; (2) discuss the scope for the monitoring and evaluation (M&E) of traditional medical services in terms of service utilization, quality and safety; and (3) make recommendations for developing the M&E of traditional medical services. Before attending the workshop, each country had to submit their country report on TM situation and M&E guidelines that covered service utilization, quality and safety for review and discussion at the workshop.

At the workshop, Thailand was one of the two countries that made two presentations on the experiences in the M&E of traditional medical system:

- The use of Thai Traditional Medicine & Integrative Medicine Promoting Hospital Standard (TIPhS) for evaluating TTM service quality at health-care facilities; and

• Real-time data collection system using the TTM health script to monitor the TTM services delivery. In this regard, Thailand was the only country that used the ICT system in such monitoring across the country. That was a good example for other member states to be alert and interested in using ICT for such purposes.

Development of a standard reference set of indicators to monitor traditional medicine in WHO/SEAR

In connection with the Pyongyang workshop, two officials from DTAM of Thailand (directors of the Office of International Cooperation and the Office of Information and Knowledge Bank) were invited to take part in the "Informal consultation to develop a standard reference set of indicators to monitor traditional medicine in Member States of WHO South-East Asia" on 10–11 August 2016 at the WHO/SEARO in New Delhi, India. Before attending the meeting, Thailand had to provide SEARO with answers to the questions related to the 41 draft indicators on this matter, based on the 4 strategic objectives of the WHO traditional medicine strategy and the expected results of each strategy.

Based on discussions at the informal consultation of all participants from Bhutan, India, Sri Lanka, Philippines, and Thailand, the meeting selected 16 indicators of key outcomes and 24 reference indicators, 3 of which were crossed out after the meeting; so totally 37 remaining. WHO/SEARO will send the list of such indicators including their definitions in all metadata to all member states for comments about the feasibility of using them in their countries. The comments and suggestions will be used in finalizing the key indicators for actual use in the future.



Technical Consultation to develop a reference set of indicators to monitor traditional medicine performance in WHO SEAR, Sri Lanka Room, New Delhi, 10-11 August 2016

Photo 6.13 Informal consultation to develop a standard reference set of indicators to monitor traditional medicine in Member States of WHO South-East Asia Region, 10–11 August 2916, New Delhi, India

6.6 Bilateral cooperation

In addition to Thailand's regional or multilateral cooperation on traditional, indigenous and alternative medicine, DTAM has developed bilateral cooperation on such a matter with several countries, the outstanding of which during 2014–2016 are as follows:

6.6.1 Thailand-Myanmar cooperation

In 2013, the ministries of health of Thailand and Myanmar signed a memorandum of understanding for public health cooperation in 8 areas, including traditional medicine that is coordinated by DTAM.

Under the MOU, the joint action plan for 2013–2016 specifies the framework for traditional medicine cooperation in the following aspects:

(1) Development of TM personnel through study visits and training

(2) Development of TM drug quality and production through study visits and training

(3) Development of TM research through joint research studies

(4) Enhancement of capacity through information exchange regarding laws and regulations related to traditional medicine

6.6.2 Thailand-Bhutan cooperation

In connection with the visit to Bhutan of Prof. Dr. Piyasakol Sakolsatayadorn, Minister of Public Health, as per the invitation of the Bhutanese health minister, on 30 June–3 July 2016, to strengthen relations and promote health cooperation between the two countries. Both parties discussed ways for health cooperation and reviewed the MOU on Collaboration in Health Development signed in 1987, and jointly prepared an action plan for cooperation in four branches, one of which is traditional medicine, and agreed that the MOU's revision will be finished by the end of FY 2017.

Bhutan's Ministry of Health sent some officials from its Department of Traditional Medicine on a study and consultation visit to relevant public and private agencies in Thailand on 17–22 August 2016 through DTAM's coordination.

The Department of Traditional Medicine (of Bhutan) and DTAM (of Thailand) have jointly prepared a plan for traditional medicine coordination for submission to their respective ministry of health for consideration before the signing of the revised MOU in FY 2017.

6.6.3 Thailand-India cooperation

In September 2016, Dr. Suriya Wongkongkathep, then director-general of DTAM, made an official visit to India to discuss the cooperation on traditional and alternative medicine with the Ministry of *Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy* (Ministry of AYUSH) of India. Both parties agreed to the following areas of cooperation:

(1) Teaching/learning and research for the advancement of alternative medicine in both countries

(2) Exchange of experts

(3) Fellowships for further study

(4) Development of pharmacopoeias and formularies

(5) Technology transfer

(6) Promotion for raising traditional medicine so that it is internationally recognized

6.6.4 Thailand-China cooperation

1) Sichuan (Szechwan) province

DTAM has implemented two projects under the MOU on traditional medicine research and development with Chengdu University of Traditional Chinese Medicine (TCM) of the People's Republic of China.



(1) Development of Traditional Chinese Medicine Dictionary Project. The project's aim was to produce a TCM dictionary for efficient use in the teaching/learning purposes and as a reference for medical doctors/acupuncturists, TCM doctors/practitioners and other interested persons. The TCM Dictionary (Chinese-Thai-English) contains 3,000 words commonly used in clinical settings, covering basic TCM theory, TCM examination and diagnosis, TCM pharmacy, acupuncture, moxibustion, and Chinese massage. The words were selected by a team of experts from Chengdu University of Traditional Chinese Medicine, prepared in three languages (Chinese, Thai, and English), and listed according to the "pinyin" pronunciation. The dictionary has been published in three volumes, 1,000 words each; copies of which have been distributed to universities (in Thailand) that offer a TCM teaching/learning programme.

(2) Preparation of standards of commonly used Chinese herbs (materia medica) in Thailand. The aims were to set the standards for use in controlling Chinese herbs quality and standards, to support the consumer protection efforts regarding Chinese herbs in Thailand, and to provide such information to TCM practitioners, academics and traders as well as other interested persons. The content of the textbooks is the compilation of technical information on Chinese herbs in Thailand, prepared in three languages (Thai, Chinese and English), with details on the items related to the standard specifications of herbs according to the Chinese Pharmacopoeia and the standard textbooks of the People's Republic of China. The texts in Chinese ad English were prepared by experts from Chengdu

University of TCM, according to the Chinese Pharmacopoeia of the People's Republic of China, drug industry standards, and up-to-date research results. Whereas Thai experts prepared the text in Thai, examined the herb powder identity microscopically, and examined the chemical identity using the methods suitable for Thailand. At the end of the project, two volumes of textbooks were prepared on Standard of Chinese Materia Medica in Thailand: Volume 1 containing 15 target herbs and Volume 2, 17 herbs, totalling 32 herbs as shown in Photo 3.4 of Chapter 3. Copies of the textbooks have been distributed to relevant agencies for their use, such as in traditional drug registration of the Food and Drug Administration (Thai FDA).

2) Shanghai City



DTAM signed a five-year cooperative agreement with the Health and Family Planning Commission of the Shanghai Municipality, China, on traditional medicine research and development on 29 August 2007 in Bangkok, effective until 29 August 2012. The agreement was extended at the 2nd meeting in Bangkok on 26 July 2013 to continue technical cooperation on TM training, expert exchange, herb production technology, and research and development. Both parties also agreed to take turn hosting an annual technical meeting.



Under the agreement, activities undertaken are annual technical meetings and annual cooperation committee meetings on the development of traditional medicine in both countries, the exchange of experience in treatment procedures and clinical research, and the exchange of personnel in basic acupuncture training for modern medical doctors. But other activities have not been implemented yet.

Besides, cooperation efforts were undertaken with other TCM universities under the Thailand-China Science and Technical Cooperation Project, coordinated by the Ministry of Science and Technology, as follows:

The Acupuncture/Integrative Therapy Knowledge Management Project to prepare a textbook on acupuncture/integrative therapy for treating conditions that are health problems of the country. One of such books has been published as shown in Photo 3.4 in Chapter 3, containing the information about acupuncture for treating migraine, cerebrovascular disease, knee osteoarthritis, rheumatoid arthritis, and other pains.

The cooperation with Hubei University of Chinese Medicine on TCM service data collection in Thailand – A book on the list of codes of diseases, symptoms and TCM procedures as well as a handbook for its utilization was prepared and then applied to the health data collection in the Thai health-care system. The data will be used for various purposes, see Photos 3.1 and 3.2 in Chapter 3.

3) International standard: ISO/TC 249 Traditional Chinese Medicine

Thailand has become a member of the International Organization for Standardization (ISO) that has established a new technical committee on TCM, i.e. ISO/TC 249 Traditional Chinese Medicine. The committee comprises 36 member states (as of 2016), including 21 P-members and 15 O-members. As for Thailand, DTAM's Institute of Thai-Chinese Medicine has been designated by the Thai Industrial Standards Institute to represent Thailand (P-member with a voting right) on the issue of TCM.

Thailand has appointed experts as members of the TCM subcommittee to work together with other member states on five aspects: (1) quality and safety standards for raw herbs; (2) quality and safety standards for herbal products; (3) quality and safety standards for acupuncture needles; (4) quality and safety


THE 5TH PLENARY MEETING OF ISO/TC 249 IN KYOTO, 2014

standards for non-needle products; and (5) quality and safety standards for information. The experts carry out their tasks via email and attend the annual meetings of the ISO/TC 249 Traditional Chinese Medicine, beginning in FY 2011.



As of 2016, the ISO/TC 249 has established six TCM standards as follows: (1) ISO 17218:2014 Sterile acupuncture needles for single use; (2) ISO 17217-1:2014 Traditional Chinese medicine – Ginseng seeds and seedlings – Part 1: *Panax ginseng* C.A. Meyer; (3) ISO 18664:2015 Traditional Chinese medicine – Determination of heavy metals in herbal medicines used in traditional Chinese medicine; (4) ISO 18665:2015 Traditional Chinese medicine – Herbal decoction apparatus; (5) 18666:2015 Traditional Chinese medicine – General requirements of moxibustion devices; and (6) ISO/TS 18790-1:2015 Health informatics – Profiling framework and classification for Traditional Medicine informatics standards development – part 1: Traditional Chinese medicine.



Chapter

7

Thai Traditional Medicine Reform for Sustainability

Among opportunities and threats that have occurred and are occurring in the 21st century, while national development efforts in the past seemed to primarily emphasize heavy industries, Thailand gets stuck in the "middle-income trap". As evidenced in the past 50 years, the first phase (1957–1993) witnessed a steady economic growth of 7–8% per annum, and later on since 1994 until today the annual growth has been only 3–4%. Moreover, the country has been facing the "inequality trap" of prosperity and the "imbalance trap" of development.

That is a big question in Thailand's development effort in the future, so the country needs major reforms and adjustments in a systematic manner. That is to make its economic and social structure suitable for the new global landscape, which has to be rapidly flexible to cope with new forms of risks and threats. And the country has to use the opportunity related to the changes in the global context for the benefits of its people.

That has led to the setting of the 20-Year National Strategy for the country to move towards stability, prosperity and sustainability. The strategy is implemented under the guidance of the National Strategy Development Committee, set up by the Cabinet's resolution of 30 June 2015, and is regarded as the umbrella framework for national development in various sectors. And all government agencies have to formulate their respective plans in line with the strategy and get them implemented in the same directions.

In the meanwhile, another mechanism so-called the "National Reform Council, or NRC", now defunct and later becoming the "National Reform Steering Assembly, or NRSA", which works on Thailand's reform efforts, have touched on Thai traditional medicine (TTM) as one of its reform areas. Details and recommendations for TTM reform have been worked out by the Subcommittee on Thai Traditional Medicine Reform, under the NRC's Committee on Public Health Reform; the Subcommittee was chaired by Admiral Chanchai Charoensuwan and had Dr. Pramote Stienrut as secretary. And under the NRSA's Public Health and Environment Reform Steering Committee, there is a Subcommittee on National TTM and Herb System Reform; the Committee has Mr. Kitti Pitaknitinun as secretary and Adjunct Asst. Prof. Dr. Thavatchai Kamoltham as a technical expert.

Thus, the essence of this chapter on "Thai Traditional Medicine Reform for Sustainability" deals with the national strategy and the TTM reform principles as they are the framework for TTM development at the national level. And all TTM-related agencies have to use such a framework in developing their action plans for further driving TTM development activities in the same directions and in line with each agency's mission.

7.1 Why does TTM have to be reformed?

According to the background paper for preparing the TTM strategy and reform, the reasons related to TTM and its reform are as follows:

7.1.1 Pressure of changes in various dimensions in the world, which occur rapidly over the past decade. Such pressure has resulted in significant changes in global landscape that will affect Thailand and be linked to TTM development. Importantly, the industrial economic and social landscapes in the world have changed to digital economy and society, resulting in Thailand being at risk of adjustments due to free and rapid flow of people, capital, information, knowledge, technology, goods and services. Fierce competition will be encountered in new and smart technology that will affect human livelihood and generate new ways of doing business. So Thailand has to invest in human resources and research

to develop new technology to increase productivity and enhance innovation. As the world population structure has been regarded as an ageing society, there will be new business opportunities and risks regarding the fight for labour and capital, in addition to the pressure related to rising social welfare and health expenditures in many countries. That is a major financial risk.

7.1.2 Global and regional agreements affect the expansion of herbal product market and the grabbing or theft of Thai traditional wisdom or knowledge. The important agreements are:

1) Agreement on ASEAN harmonization regarding the production of medicines or drugs including herbal drugs for export in ASEAN. The agreement requires that such production must comply with the Good Manufacturing Practice (GMP). Thus, all 877 Thai traditional drug manufacturers have to comply with such requirements. At present, only 25 of such producers meet the ASEAN GMP requirements. In this regard, most of Thai factories are of small scale with little business profits; so they are unable to invest on such improvement. To date, the ASEAN harmonization requirements have been revoked by the Thai FDA announcement on criteria for issuing a GMP certificate for traditional medicine manufacturers (dated 22 December 2014).

2) Bilateral free trade agreements (FTAs). Thailand's FTAs with developed countries such as the USA and other in Europe contain many demands especially for the membership of international treaties such as the International Convention for the Protection of New Varieties of Plants (UPOV 1991). Moreover, the protection of plant and animal varieties under the patent system may result in the snatching/stealing of herbs and wisdom if there are no preparedness plans or measures to respond to impacts and bilateral trade negotiations. Thus, there are both crises and opportunities for TTM development – an opportunity for Thailand to expand Thai massage services to countries with trade barriers, but its business and management capacity has to be enhanced. In addition, some developed countries such as the USA and those in the European Union tend to raise the issue of modern drug patent for trade negotiations, resulting in a longer period of modern drug

patent monopoly and a higher drug price. That is an opportunity to accelerate the development and promotion of herbal drug utilization for self-reliance.

7.1.3 Needs for raising various standards to the international level. That is an opportunity for Thailand to have been a middle-income country since 2010. In 2014, its per capita income rose to 5,739 USD per year, resulting in several manufacturing and service sectors being able to compete and have a higher share in the world market, and substantially bring in foreign currencies. Such sectors are automotive, electronic and electrical appliances, food industry, agricultural products, tourism and health services. The people's quality of life is better at all levels with better opportunity or access to education, health care, public services, and infrastructure. Social protection and access to resources are steadily of higher quality. Through bilateral and multilateral cooperation with other countries, Thailand has been able to raise its standards in various aspects to the international level.

7.1.4 Resolving several weaknesses of the country. The weaknesses that are factors and conditions for Thailand's development especially Thai traditional medicine are, for example, a greater proportion of elderly population as the country will become an aged society in the next 15–20 years. That will affect the economic potential of the country in terms of spending, investment and saving patterns, health-care spending, social security and quality of life of the elderly. Whereas the weaknesses related to the economic structure based on agricultural production and services, their productivity is still low as very little of knowledge, technology and innovation is actually used for value addition. Moreover, the weaknesses are due to low investment on research and development (R&D), ineffective use of research outcomes for economic and social benefit, low innovation development, and weak public sector operations and management. That is due to a lack of integration, resulting in financial wastage, non-continuous development, low efficiency, and lack of transparency and accountability.

7.1.5 Thai people are facing an NCD crisis with a rising trend. Health statistics have shown that the morbidity due to chronic, non-communicable diseases (NCDs) is rather high; the number of NCD patients rose

almost twofold from 1,682,281 in 2005 to 3,099,685 in 2012. In 2015, MoPH's Department of Disease Control estimated that Thailand's economic loss due to NCDs would be as much as 52,150 million baht. Based on the prevalence rates per 100,000 population of five NCDs between 2008 and 2012, the rate was highest for hypertension, followed by diabetes, chronic lower respiratory disease, ischemic heart disease, and cerebrovascular disease. However, as the morbidity pattern of the Thai population has shifted to NCDs and degenerative diseases, most patients tend to seek modern medical care primarily with imported modern medicines. As a result, health-care spending is very high, causing a rising burden on the country's health insurance budget, while medical personnel at state health-care facilities are inadequate to provide medical treatment.

7.1.6 Concept of departmentalized western medical and health care influences Thais' health-care concept. The departmentalized health-care concept of the West has spread all over the world for not less than 50 years, causing fragmented health care and specialized knowledge and technology for medical treatment for each issue of each disease and each organ. That has resulted in the negligence of the importance of subcomponents in the body including human mental condition. So health care is not undertaken in a holistic manner, while the WHO has defined "health" as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. All these dimensions of health are interconnected and result in the quality of life or the balance of life.

7.1.7 TTM wisdom gives importance to holistic health care, but its potential has not been fully developed for Thai people's health care, integration with modern medical services and creation of economic value in the following aspects:

1) TTM wisdom has been used for holistic health care for the Thai people for a long time. Originally, it was the mainstream medical service of the community and Thai society. Later on, western medicine was adopted to replace traditional medicine, especially the services that did not exist in TTM such as surgery, infectious disease prevention, and antibiotics. As western medicine becomes more advanced, Thai traditional and indigenous medicine was negated, neglected and abandoned

by the state. However, TTM can be applied together with modern medicine in all human dimensions, especially for the prevention of NCDs, which are caused by changing lifestyles.

2) At present, TTM and Thai indigenous medicine (IM) has been revived to play an important role in health care for the Thai people. That is in line with the policy and directions for promoting traditional medicine according to the WHO Traditional Medicine Strategy 2014–2023 that aims to integrate traditional and complementary medicine (T&CM) into the national health-care system. Such efforts will be made by: developing and implementing each country's T&CM policy, for it to be safe, efficient and of good quality; expanding the knowledge base and giving advice on rules/regulations as well as quality assurance standards and service accessibility; increasing channels for accessing T&CM; ensuring suitable service fees for the poor population; and supporting the use of effective T&CM by medical personnel and consumers.

3) Thailand has been integrating TTM services into the national health-care system for 10 years. In this regard, more TTM service units have been continually set up at existing state health-care facilities, but that has not been adequate. Meanwhile, TTM services still face major obstacles – people's lack of confidence and faith in TTM and herbs for Thai drug production not being sufficiently promoted and conserved by the government, resulting in poor qualities and qualities of raw herbs for producing quality Thai drugs or health products for the health-care system.

4) **Thai drugs or herbal health products are efficacious in curative care or disease prevention as proved by clinical studies**. For example, *fa-thalai-jon* or kariyat (*Andrographis paniculata*) can be used for preventing common cold during the cold season and for treating acute diarrhea and bacterial dysentery; raw banana is used for treating gastritis [a study in rats or lab rodents has shown that the extract from banana (*kluai-namwa, Musa sapientum*) peels has an antacid effect and coats the stomach lining]; laurel clockvine or *rangjued* (Thunbergia laurifolia) as herbal infusion can be used as an antidote for poisoning, reducing cadmium poisoning in rats, pesticide poisoning, and horseshoe crab poisoning; and cat's whisker or *ya-nuat-maeo* (*Orthosiphon aristatus*) is effective for treating kidney and

urinary stones (a study conducted at Ramathibodi Hospital shows that the herb can reduce the size of stones in 23 cases, expel kidney stones in 40% of the cases, and improve the condition in 20% of the cases).

5) Due to TTM wisdom's strengths, the rights to such wisdom have been snatched/stolen for scientific and technological development to produce new drugs by foreigners. For example, some palm-leaf TTM scripts were bought for getting the knowledge transcribed for use in developing new drugs for commercial purposes in the global health-care system. Another case related to this matter was the provision of scholarships to Thai students overseas to conduct research on medicinal plants in Thailand. As TTM wisdom is not seriously protected, Thais' benefits are not protected as expected.

7.2 TTM situation and major problems to be resolved

In a review of the situation and major problems in the TTM development, according to the background paper at the public hearing meeting of the TTM Reform Subcommittee, attended by experts, academics, members of the public and other relevant persons, the surveys on public opinions nationwide, the evaluation reports on the performance of relevant agencies, and other related documents, the issues of TTM development have been identified as follows:

7.2.1 Mechanisms related to inefficient and unintegrated management of TTM development – the system is not fully functional

Many forms of mechanisms for TTM development have been used under three major laws. Firstly, under the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or the 1999 TTM Knowledge Protection Act, the first TTM law enacted to protect and promote TTM knowledge or wisdom and herbs as well as biodiversity resources and relevant local wisdom. The work is overseen by the TTM Knowledge Protection and Promotion Committee and the Thai Traditional Medical Knowledge Fund. Secondly, under the Reorganization

of Ministry, Sub-Ministry, and Department Act, B.E. 2545 (2002), the Department for Development of Thai Traditional and Alternative Medicine was established in 2002 (today renamed: Department of Thai Traditional and Alternative Medicine, or DTAM) to take charge of collecting, conserving, protecting and promoting TTM wisdom or knowledge as well as duties prescribed in the 1999 TTM Knowledge Protection Act. And thirdly, under the Thai Traditional Medical (TTM) Professions Act, B.E. 2556 (2013), the Thai Traditional Medical (TTM) Council was established as a juristic person that plays a significant role in developing TTM personnel in a professional manner and further develop TTM to be more reliable.

Each of the aforementioned mechanisms has different powers and duties. However, evaluations of the performance of relevant agencies show that there has been a lack of integration of their operations to be in line with the national development directions. And there are weaknesses that need to be resolved so that all these mechanisms can efficiently drive TTM development actions further for the people to have more confidence and faith in TTM services. The major issues are:

1) DTAM has a huge workload that does not correspond with a small number of middle- and high-level personnel. Moreover, there is no continuity in the implementation of policy-directed activities. In terms of organizational structure, according to the MoPH's ministerial regulation on DTAM's reorganization of 2009 and another reorganization of June 2015 to cope with the increased responsibilities, the number of personnel increased slightly to 197 for civil servants, 55 for government employees and 2 for permanent employees.

The major problem is the small number of personnel especially at the professional level up to expert level, or advisory level in traditional and alternative medicine (TM/AM). So the personnel at such levels are not sufficient for driving TTM development with large quantities of actions, resulting in limitations in the operations required by law. And the work can not be carried out continuously and extended further as the top administrator of the department takes turn being in office only for a short period of time, say 1 or 2 years, resulting in the non-continuity of policy setting and implementation.

2) The TTM Knowledge Protection and Promotion Committee that appears in Section 5 of the 1999 TTM Knowledge Protection Act comprises the

MoPH Permanent Secretary as chairperson, the director of the TTM Institute as member ad secretary, nine other *ex officio* members, and nine other qualified or expert members.

As for qualified members, their selection is undertaken in accordance with the ministerial regulation on criteria and procedures for selecting qualified members B.E. 2546 (2003); and then they are appointed by the Minister from a group of medical practitioners and a group of persons having knowledge, capability or experience in Thai traditional medicine, production or distribution of Thai traditional medicine**,** and plantation or transformation of herbs. Their term of office is two years as per Section 7 of the 1999 TTM Knowledge Protection Act.

The major problem is the complexity of the qualified members' selection procedures, which are time-consuming and require a lot of budget. Their term of office is rather short, only two years. Qualified members are regarded as key persons on the committee in specifying directions and measures for the protection and promotion of TTM wisdom and herbs of the nation. That is regarded as a weakness as qualified members require much time to understand their roles and duties prescribed by law.

As for *ex officio* members, a missing element is the political sector, which is regarded as an important part in pushing TTM development in a sustainable manner. It has been suggested that the Minister of Public Health should be the chairperson of the committee under this law.

Besides, the performance of the committee has been noted for their slowness in pushing for the legislation of secondary laws for use in TTM and herb development and protection. In the past, it took a long time; thus, there should be a revision of the composition and powers/duties of the committee as well as the structure and positions/duties of government officials in the unit that serves as the committee's secretariat so that they have a sufficient number of personnel to more efficiently handle their assignments.

3) The TTM Knowledge Fund, prescribed in Section 76 of the 1999 TTM Knowledge Protection Act, is under DTAM's Institute of Thai Traditional Medicine and run by the TTM Knowledge Fund Subcommittee. The Fund's spending is in accordance with the Regulation of the TTM Knowledge Protection and Promotion Committee B.E. 2548 (2005); and its budget for FY 2015 was 120 million baht.

The major problem is the small amount of budget the Fund receives each year in relation to its huge workload on the protection and promotion of TTM knowledge and herbs across the country. So far, only parts of its tasks have been accomplished. Thus, the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), should be amended; and regulations should be issued for fund accounting, income generation, and more autonomous and flexible management of the Fund. That is to be similar to other funds under other laws such as the National Health Security Fund and the Thai Health Promotion Foundation.

4) Thai Traditional Medical (TTM) Council is a juristic person under the Thai Traditional Medical Professions Act B.E. 2556 (2013). Its major roles and duties include the setting of standards for TTM treatment, teaching/learning, and training programmes of all health-care facilities and educational institutions in both public and private sectors. All concerned have to raise their training standards as prescribed by the TTM Council so that all TTM practitioners in the future will be of high quality. The Council also oversees the behaviour of TTM practitioners as per the professional code of ethics.

The major problem is the fact that the TTM Council is in the initial stage of its establishment and the government's financial support is required. That is not different from that for the Medical Council of Thailand or the Dental Council, which regularly receives government budget every year. The Council needs to create the participatory process for professional development.

5) Ministries, sub-ministries and departments involved in TTM and herbs need the integration of efforts according to the upstream, mid-stream and downstream coordination strategy.

However, the MoPH together with another eight ministries and other public and private sector agencies drafted a Master Plan for Herb Development (No. 1), 2017–2021, for submission to the Cabinet for review and approval. The Plan was endorsed by the Cabinet on 4 October 2016.

7.2.2 TTM reform: issue-based and structure-based problems

1) The structure for TTM workforce development is faced with the problems of TTM personnel production quality and quantity

1.1) The production and development of TTM workforce has three components:

1.1.1) Production systems at higher education institutions. At present, there are nine higher education institutions or universities offering a bachelor's degree in applied Thai traditional medicine (applied TTM, or ATM), which has been recognized by the TTM Council. As per the TTM Council's advice, in 2011 the Ministry of Education issued a notification on the standards of Bachelor of Applied Thai Traditional Medicine (B.ATM.) programme, a four-year course. All such universities have their own health-care facilities for students to practise their applied TTM service skills with patients, on a non-overnight stay basis. They have no hospitals for 24-hour patient care and no inpatient services. Upon graduation, the graduates can take a licensing examination and then apply for a practice licence from the TTM Council only in the applied TTM branch.

Meanwhile, there are another 18 higher education institutions that offer a Bachelor of Thai Traditional Medicine (B.TM.) programme, a four-year course endorsed by the TTM Council, but there has been no notification on programme standards. However, upon graduation, the graduates can take a licensing examination and then applied for a practice licence from the TTM Council in four branches: Thai medicine, Thai pharmacy, Thai midwifery, and Thai massage.

1.1.2) Training to become a TTM practitioner category A, including two groups of training. Group 1, for TTM trainees who have been trained under the individual teacher-student (mentor-apprentice) approach before the TTM Council issued the regulation on criteria, procedures and conditions for the testing of knowledge on TTM profession for persons who have been trained at an institute or health-care unit recognized by the TTM Council B.E. 2557 (2014). Group 2, for TTM trainees who have been trained at an institute or health-care unit recognized by the TTM Council. At present, there are 140 institutes or health-care units recognized by the TTM Council, all of which are recognized for Thai massage, only a few are recognized for Thai medicine and Thai pharmacy.

1.1.3) The assessment of folk healers to become legally recognized TTM practitioners (Category C), another type of TTM workforce. Previously, the TTM Professional Committee conducted an assessment of folk healers to become TTM/ Thai medical practitioners as per Section 33(1)(c) of the Healing Arts Practices Act of 1999. But after the enactment of the TTM Professions Act of 2013, repealing that section of the healing arts practice law, so far there has been no such assessment. That system may resume when the TTM Council issues a regulation allowing the folk healers' assessment to be done again.

1.2) Major problems of TTM knowledge management

1.2.1) Overall educational problems – three issues are:

1) Educational systems for TTM practitioners Categories A and B and for applied TTM practitioners. Each educational institute offers a different teaching and learning programme in terms of content and objective of workforce production as well as professional scope of practice and teachers' knowledge and skills.

2) TTM educational institutions in both Categories A and B have teachers who are deficient in teaching experiences and skills. Some institutes also lack good teaching methods, processes, and equipment of acceptable standards. That has resulted in producing graduates with various knowledge depending each teacher's teaching style. It has been found also that some TTM graduates, upon entering the service system, do not have the capacity to provide patient care.

3) The TTM textbooks that are used in educational or training institutions, both Categories A and B, are old ones. TTM textbook development is important for TTM development in terms of teaching/leaning, medical practice and research. The lack of further research and support for knowledge management by TTM teachers has resulted in the inability to improve TTM textbooks.

4) The quality of TTM workforce production in all categories of educational institutions affects the quality of care and the acceptance of people and modern medical personnel. The education and sources of TTM practitioners are diverse with a lot of discrepancies, resulting in the quality of care. Currently, TTM services are accepted at a rather low level by the people as

well as other medical and health professionals in state health-care facilities. And TTM personnel are not health-care leaders at such facilities. Thus, it is necessary to raise the level and standard of TTM profession to a large extent, ranging from the selection of students into the TTM educational and training system, and curriculum development, to institutional development at all levels. In these efforts, the TTM Council will play a key role in setting various standards, essentially the issuance of TTM Council regulations on directions for TTM workforce development for the country.

1.2.2) The problem of producing TTM graduates Category B in higher education institutions, affecting the quality of TTM workforce. In comparison with the educational system for modern medical students, the scopes and training periods for TTM students were narrower or shorter regarding basic science and pre-clinic classes and practical training at TTM service units.

1.2.3) The problem of TTM practitioners Category A training at institutions recognized by the TTM Council with regard to discrepancies in the training system for the two groups of learners or students (the mentor-apprentice group and the institution-based learning group). As per the TTM Council regulation on criteria, procedures and conditions for the certification and operation of institutions or health-care facilities certified to provide training in TTM profession B.E. 2557 (2014), the schools, temples, associations and foundations previously permitted to run a TTM training programme are going to close down as their operations are against the 2014 regulation.

1.2.4) The problem related to the registration of folk healers Category C. Folk or indigenous healers in the old category acquired their knowledge through the passage of practices from their ancestors, from one generation to another. At present, most of them are elderly persons, having no followers or learners to take on the practice as the young generation are not interested in this science. Even though one educational institute in the North and another one in the Northeast have transcribed the knowledge from folk healers from each of the regions and designed a course on folk healing for their TTM curriculums, as the students taking that course have different cultural, social and economic backgrounds, compared with the old folk healers, their folk healing spirit is not as high as that among those who have learned from their ancestors.

A review of the statistics on Thai folk healers as of 2016 shows that there are 57,665 folk healers, of whom 165 (0.3%) passed the knowledge assessment and got registered as certified TTM practitioners between 2005 and 2013. Of all 165 certified folk healers, 109 are herbalists and 39 are bone healers; they are 41–93 years old and 64.2% of them are in the 61–80 age group.

1.3) TTM workforce situation. According to Section 4 of the TTM Professions Act B.E. 2556 (2013), "**Thai traditional medical professions**" means professions relating to the practice of Thai traditional medicine (TTM) and the practice of applied Thai traditional medicine (applied TTM, or ATM). As for the first type, TTM practice includes Thai medicine, Thai pharmacy, Thai midwifery, Thai massage or any other type of Thai traditional medicine designated by the Minister with the advice of the TTM Professions Committee; whereas the second type is the practice of applied Thai traditional medicine. The workforce situations of TTM practitioners and ATM practitioners are as follows:

1.3.1) TTM and ATM practitioners. During 2012–2015, the TTM Council statistics showed that there were 64,244 TTM and ATM practitioners, of whom 61,676 (96%) were TTM practitioners (one TTM practitioner can have more than one branch of TTM practice licence) and 2,568 (4%) were ATM practitioners.

However, according to DTAM's survey of TTM personnel working at health-care facilities as of 29 February 2016, there were 2,692 TTM and ATM practitioners and 8,587 TTM assistants who had completed at least 330 hours of Thai massage training.

1.3.2) Folk healers. According to the database of DTAM's Central Registrar's Office, as of May 2016, there were 57,665 folk healers classified as per their expertise into six groups, i.e. ritual healers, herbalists, masseurs, traditional birth attendants (TBAs), bone healers, and others. Of that number, 16,000 had more than 20 years of experience in community health care. As for folk healers' knowledge assessment, 2,000 of them had their knowledge assessed during 2005–2015, but only 165 passed the assessment and became certified folk healers or TTM practitioners.

2) The structure of R&D on TTM wisdom: a small number of studies have been further developed and a lack of clear national research directions

2.1) Overall, there are a lot of TTM research studies, but most of them are thesis-level

2.1.1) **Important situations.** Currently, a rather large number of TTM studies have been undertaken, even though most of them are theses, covering diverse areas, namely social sciences, TTM theory, pre-clinical and clinical research, and herbal development related to determining extracts and herbal drug efficacies. The number of policy and strategy studies is rather small. A small number of them (45 papers per year) have been published in international journals. In terms of TTM areas, studies have been done in five major aspects: TTM theory, Thai massage, TTM service, research for development, and legal affairs including TTM wisdom protection.

2.1.2) **The major problem** is that there are very few studies on TTM theory. Such studies are scattered, having no clear main themes with continuity. As for Thai massage research, studies are related to the theory and knowledge of Thai massage as well as therapeutic effectiveness, but those on "ten-line", or *sensib* theory, are very few. Concerning studies on TTM service, most of them are on client satisfaction, which have shown that the clients are very satisfied with the services and expect to benefit from such services, especially herbal therapy and Thai massage. However, the research results have not been beneficial and actually used for improving TTM services as expected.

2.2) Increase in R&D on working systems at health-care facilities and communities is rather little

2.2.1) **Important situations:** qualitative studies using statistical and descriptive social science methodologies in making definitions and interpretations are those involving, for example, TTM knowledge, indigenous and alternative medicine, illness-healing models with diverse procedures, and socio-cultural values of TTM. However, the increase rate of such studies is rather small.

2.2.2) **The major problems** are limitations related to study timeframes and field operations.

2.3) Research in humans has not been fully developed

2.3.1) **Important situations.** According to the medical and public health professional requirements, research studies in humans are to be approved by the Ethical Review Committee for Research in Human Subjects. This is to protect human subjects from exploitation by researchers. Currently, all institutes can set up their own human subject research committees. As there is no law prohibiting such research, in principle, if the study has not been approved by the Committee, its research paper cannot be published for result distribution to the public. Today, a law on human subject research is being drafted for use across the country.

2.3.2) **Major problems**. In the past, the approval of the human subject research was based on the discretion of the ethical review committee, whose decision sometimes was beyond their specified scope of work. As a result, an important research proposal leading to other studies was rejected. In many instances, if the committee did not understand the TTM work, they might not allow the research to move further. As regard the human subject research law that is being drafted for use in the country, it is expected that the law may affect research on humans and may be an obstacle to future TTM development.

2.4) Thai indigenous medical knowledge is embedded in folk healers who lack followers and in scriptures inscribed in ancient languages that are hard to understand

2.4.1) **Important situations.** Originally, Thai traditional and indigenous medicine (TTM/IM) was the mainstream medical service of the Thai community and society. Later on, when Thai society became a nation state, the national administration was based on the western civilization model and western medicine was adopted to replace traditional medicine, especially the procedures that did not exist in traditional medicine, such as surgery and infectious disease treatment with antibiotics. Advances in modern medicine have made Thai traditional and indigenous medicine become negated and neglected by the state.

However, even though certain prices of TTM/IM knowledge have been lost, many others have been conserved continuously as it has been noted that most of folk or indigenous medical wisdom is “tacit knowledge” embedded in individual folk healers, who are knowledgeable of such healing practice and

theory. Some of them have specialized expertise in certain aspects of folk medicine. According to the Central Registrar's database, as of 2016 there are 576,665 folk healers and the folk healing knowledge is recorded or inscribed in a lot of palm-leaf and *pap-sa* (sa paper) books as well as other forms of books collected or retained by folk healers, temples and universities.

Meanwhile, TTM knowledge still exists in national Thai drug formulas and textbooks as evidenced in MoPH's notifications in 2015 and 2016, designating 48 and 154 national TTM textbooks and 4,459 and 12,125 national Thai drug textbooks, respectively. As some of such textbooks contain sub-scriptures in the old Thai language that is hard to understand for present-day Thais, they have to be transliterated, translated, transformed and revised by TTM experts/teachers as well as experts in medicinal plants, animals and minerals, who can help with correct interpretation and explanation. Such efforts have led to the classification and standard coding of TTM wisdom or knowledge and the response to the questions of TTM wisdom protection as well as research for knowledge development.

2.4.2) **Major problems.** As a lot of the knowledge of TTM and herbs has been lost, it is thus necessary that efforts for existing knowledge conservation, revival and further development be undertaken. That can be done using scientific methods, especially for evidence-based knowledge through the integration with TTM experts' experiences in a suitable and systematic manner. The aim is to bring back the TTM/herb knowledge for use in the Thai health-care system.

As for the **indigenous or folk medicine knowledge**, it still exists in folk healers, most of whom are elderly persons that do not have any followers or learners to conserve such knowledge. Their children or grandchildren are not interested in the healing practice either. It is thus essential that folk healers' tacit knowledge be studied and transcribed as rapidly as possible before it is lost with their elderly demise. That is also because such knowledge was recorded or inscribed in palm-leaf or *pap-sa* textbooks or others, and there is no system to support or promote its transcription, explanation, storage and distribution with a proper direction.

As for the **national TTM knowledge** existing in the forms of textbooks or scriptures that were inscribed in the ancient Thai language, there has been a problem of slowness in their transcription, translation and revision due to the lack of personnel and financial support in a systematic manner.

2.5) The knowledge and development of herbs, herbal drugs and herbal products need accurate scientific references and extended development to increase economic values

2.5.1) **Important situations**. According to the Healing Arts Practice Control Act of B.E. 2479 (1936), TTM practitioners were required not to use scientific and technological principles in further developing TTM knowledge. Over 50 years later, despite the Act's amendment No. 9 of 1987, allowing the use of science in TTM research studies, it has been found that most TTM practitioners have used very little of science in their TTM development.

Besides, according to the situation analysis of the R&D on TTM knowledge development, the use of the research concepts and principles that are suitable for this kind of medical practice with the goals of research utilization has been on the rise. That is in connection with the acceptance of TTM knowledge and the fact about medical pluralism in overall Thai society, especially in terms of rising quantities of R&D studies on herbs as well as herbal drugs and products, using scientific methods in seeking answers for the benefits of herbal industry development of the country.

2.5.2) **Major problems.** TTM and herb knowledge with scientific references is still unclear in many issues. For example, the scientific names of some herbs are unclear according to the taxonomy principle and some are still debatable. In the case of *Khrai-khruea (Aristolochia spp.)* this herb has been deleted from a traditional drug formula in the National List of Essential Medicines as it is carcinogenic. But there has been an argument that the deleted herb is not the same even though it has the same scientific name; and DTAM has claimed that mixing it with several other herbs may lessen its toxicity.

As regard research on creating the knowledge for developing herbs, herbal drugs and herbal products, there has been a lack of research to develop modern technology for creating new products. The methods and laboratories are

lacking for controlling the quality of raw herbs and herbal products so that they are internationally recognized. As a result, the competitive potential of Thai drug industry and herbs is low even though Thailand has abundant biodiversity and a lot of herbs for use in curative care and health promotion. The number of studies on herbal drug properties and efficacies using a scientific process is rather low, compared with the number of herbs that need to be promoted. Besides, there are some legal problems to bring modern technology and science for product development purposes. Also lacking are the direction and management and support mechanisms for full-cycle research and development, from upstream, mid-stream and downstream, for example a study on herbal source and quality development with different ecosystems.

3) The structure of TTM service system focuses more on services at state health-care facilities rather than in the community

3.1) The situation. At present, TTM service has an interesting strength, i.e. it is efficacious in treating several chronic diseases without relying on steroids. For example, psoriasis can be treated with traditional medicine (no need for steroids); and after treatment, the rashes or skin patches can subside for a longer period of time before recurring. For work-related muscle aches and pains, massage therapy can help relieve such conditions, replace non-steroid anti-inflammatory drugs, and prevent drug-induced gastric or intestinal ulcer. For stroke (paresis/paralysis) patients in the community, TTM practitioners can provide medical and health care better than other health-care professionals as they can give massage therapy efficiently; such service is popular among the people. Moreover, herbal remedies can be used for preliminary treatment of patients before going to a health-care facility.

As TTM is efficacious for healing illnesses, it has been included in the benefit packages under the three major health insurance schemes: Universal Health Coverage Scheme (UCS), Civil Servant Medical Benefit Scheme (CSMBS), and Social Security Scheme (SSS). However, the benefits are different in terms of care and fees. Under the UCS, the government budget is allocated through the TTM Development Fund each year.

As for the CSMBS with reimbursable TTM services, state health-care facilities tend to primarily provide such services to government officials. Regarding

the medical service reports to the National Health Security Office (NHSO) and the Social Security Fund, there is no requirement for contracted hospitals to provide TTM services to their patients, but the doctors can prescribe massage therapy with no charges. However, under the SSS, the insured persons who request TTM services have to pay for their own expenses.

As for TTM services at state health-care facilities, the establishment of a TTM unit at MoPH hospitals, or model TTM hospitals, was initiated in 2009. Until 2014, 10 such TTM hospitals had been operational and providing care for complicated illnesses that could not be treated with modern medicine, such as psoriasis, cirrhosis and cancer. As for TTM services in local communities, many local government organizations (LGOs) have supported TTM/IM services by providing additional resources including personnel, funding and premises.

According to DTAM's reports between 2010 and 2015, the proportion of outpatients who had received TTM/AM services increased constantly from 5.78% in 2010 to 11.92% in 2011, and to 11.24%, 14.05%, 16.59%, and 17.51% from 2012 through 2015, respectively. It is expected that the proportion will rise to the target of 20% of all outpatients, or about 40 million visits per year. That is a result of the opening of TTM/AM services at the OPDs of community, general and regional hospitals across the country. During 2014–2015, 41.12% and 71.99% of all 897 MoPH hospitals nationwide began providing such services, compared to the 100% target.

3.2) Major problems

3.2.1) **Policy advocacy on integrating TTM into the national health-care system has not materialized**. Thailand has been integrating TTM services into the national health-care system for 10 years by constantly establishing more and more TTM units. But that is not enough due to the lack of integrative efforts of various agencies concerned and suitable service and product standards, resulting in people's lack of confidence and faith in TTM.

3.2.2) **The policy on promoting TTM services at state health-care facilities rather than at community results in the weakness of popular health sector**. At present, it has been noted that the public sector policy does not emphasize the promotion of TTM at its original base that is in the popular

sector and by civil society as expected. Government support in terms of resource allocations have not been done systematically; rather, efforts are made to enhance the growth in the public sector, while weakening that in the popular sector. Thus, the public sector has to support the TTM system to be the community's way of life, empowering the popular health sector along side the TTM system development in the government health sector.

3.2.3) **The lack of TTM personnel in terms of quality and quantity**. A survey on TTM personnel has shown that, under the MoPH health-care system, the TTM personnel to population ratio is 1:21,000. According to another study on TTM personnel requirement, being conducted, shows that the desired ratio should be similar to that of other health professions at 1:5,000. That means there is a need for another 10,000 TTM practitioners for all MoPH health-care facilities, excluding those required for private health and spa businesses.

So far, it has been found that the number of TTM personnel is not sufficient to meet the demand in the country's TTM service system, especially TTM doctors, Thai pharmacists, and TTM/herb researchers as well as those that will serve global or international activities. Moreover, many TTM personnel that have entered the health-care system are not confident in the TTM practice, including examination, diagnosis and treatment, due to a lack of good clinical practice sites, qualified teachers, and R&D experiences. That has resulted in a misconception between TTM personnel and other members of the multidisciplinary health team.

3.2.4) **Development of model TTM hospitals: many limitations.** Due to many limitations, especially those related to knowledge, research, referral system, personnel, budget, poor system management planning, and uncoordinated operations, the development of model TTM hospitals has been progressing rather slowly.

4) The structure of Thai drug industry and herbs has a high potential, but faces many problems hindering competitiveness development

4.1) Important situations

4.1.1) **The government has intensified the control of Thai traditional drug manufacturing and manufacturers**. According to Thai FDA's

Bureau of Drug Control, in April 2015, there were 877 Thai drug manufacturers. As per MoPH's notification on criteria and procedures for producing traditional medicines according to drug law of B.E. 2557 (2014), the standards for Thai drug production and manufacturers will be higher.

4.1.2) **The production of herbal drugs and products at state hospitals aiming to raise production standards.** In 2008, 46 state-run hospitals joined DTAM's GMP certification for herbal drug manufacturers project. Of that number, cumulatively 15 passed the GMP requirements in 2014, and another 5 passed in 2015. The target for 2016 is to have another 6 hospitals pass the requirements, totalling 26 hospitals in all 12 health regions. Meanwhile, development efforts have begun to help them to meet the ASEAN GMP and Halal Food requirements.

4.1.3) **Raw herb production capacity does not meet market demand.** According to the 2014 statistics of the Ministry of Agriculture and Cooperatives (MOAC), in 2013 the total land area with herb cultivation was 42,553 rai (17,021 acres), decreasing to 34,937 rai (13,975 acres, or 18%) in 2014. The herb cultivation acreage was rather small compared with the country's agricultural land area. The number of herb-growing households was only 9,015 in 315 groups of community enterprises, most of which were small farmers. As the demand for herbal extracts was rising, so was that for raw herbs, in 2014 raw herbs and extracts had to be imported from China, India and Indonesia for use in the traditional drug industry, worth as high as 1,099.71 million baht.

4.2) Major problems

4.2.1) **Discrepancies in policies on herbal and Thai drug production promotion in public and private sectors.** The promotion of herbal and Thai drug production in the public and private sectors is not based on the same standards, and there are always new requirements for private sector manufacturers, resulting in their higher investment costs to produce higher-standard products. Actually, both sectors can produce traditional drugs of the same qualities, but the private sector's additional costs have affected their capacity building efforts and become a risk for national economic development.

4.2.2) **Many herbs have to be imported**. It has been found that framers have not been supported to have correct knowledge about growing

herbs to be used as raw materials in Thai drug manufacturing. Herb growers and producers generally lack proper farm management skills or knowledge in dealing with herb varieties selection, growing and harvesting, and production control so that the herbs will be free of contaminants or adulterants. Herb quantities are insufficient for market demand. The government has not fully implemented herb promotion and conservation activities, and has no measures to strictly control raw herb qualities so as to ensue good quality Thai herbs for adequately producing herbal drugs and health products for use within the country as well as for export to bring in foreign currencies. Such herbs are, for example, turmeric, *Zingiber montanum* (J.Koenig) Link ex A.Dietr. Indian gooseberry (*ma-kham-pom*), blady-grass roots, and smilax or *khao-yen-nuea* and *khao-yen-tai*.

4.2.3) **Lack of herb R&D promotion with proper directions and systems**. The competitiveness of Thai drug and herb industry is still low, despite the country's abundant biodiversity and herbs with therapeutic and health promotion potential. That is due to the lack of modern R&D programmes, especially on new product development, and procedures and laboratories for the quality control of herbs and herbal products that are internationally recognized. And there are some problems related to legal issues in bringing modern technologies for developing new products. The number of research studies on herbal drug properties and therapeutic efficacies, using a scientific process, is small in relation to the number of herbs to be supported.

4.2.4) **The inclusion of herbal drug formulas in the National List of Essential Medicines (NLEM) is hindered by inadequate research-based evidence.** In the past, the key criterion for including a herbal drug in the NLEM was the fact that the drug had been used in humans for a long time and efficacious as per the properties stated in the Textbook of Medicine (*Tamra Phaetsart Songkhroh Chabap Luang*), Vol. 1 and 2; Textbook of Medical Studies (*Tamra Vejjasartsueksa*) of Phraya Pitsanuprasartvej; Textbook of Traditional Medicine (*Tamra Khamphi Phaetphaenboran*) of Khun Sophitbannalak, Vol. 1, 2 and 3; and Textbook of Medicine (*Tamra Phaetsart Songkhroh*), Vol. 1, 2 and 3.

But at present, using the criteria based on scientific process requires that there must be research-based evidence to support the inclusion of any herbal drug in the NLEM. However, as research on herbal drugs is a rather slow

process due to inadequate budget and a small number of researchers/experts, even though a traditional drug formula has been used for at least 30–40 years, it cannot be included in the NLEM as before. So it is noted that only 74 items of herbal drugs are included in the NLEM of 2016. The number is insufficient to cover all illnesses or conditions of the patients.

4.2.5) **The production of Thai drugs and herbal products is faced with adulteration, exaggeration and unlawfulness.** The authorities have not been able to control such illegal actions in a timely manner. At present, a number of Thai drug and herbal product manufacturers are not legally registered, often times, illegally adding unsafe chemicals such as steroids, weight-lowering substances or vasodilators into their products. Some use false, deceptive or exaggerating advertisements for their herbal drugs or products and sell them at very high prices, especially through direct sale channels, community radio, local or cable/satellite TV, or the Internet. That makes the people not only waste a lot of money and time, but also become at risk of harmful effects of such products and lose an opportunity to get proper care. That is because most people do not have correct knowledge of such a matter and are unaware of the tricks of such advertisements as well as the danger of illegal products. So they cannot take good care of themselves and protect against the harmful effects of such products. Legal measures undertaken by state agencies concerned against unlawful actions are generally untimely, resulting in victimized consumers being adversely or fatally affected as seen in the media.

4.2.6) **Laws and regulations are obstacles to the growth of Thai drugs and herbal products.** The Drug Act B.E. 2510 (1967) prescribes that Thai drugs are traditional drugs that cannot be further developed with scientific techniques, resulting in practical problems to abide by the law. As only a few TTM practitioners are members of the Drug Committee, most members are not thoroughly knowledgeable about TTM, their decisions on Thai drug development might be problematic. In addition, the present law tends to over-control the drug system, hindering the development of Thai drugs and herbal product industry. Meanwhile, Thai drug manufacturers cannot use science and technology in appropriately improving their products to be in line with current market demand, such as extracting, film-coating, soft-gel encapsulation, gel-formation, and spray-formation,

as well as modifying the drug formulas or other ingredients or additives such as binders and disintegrants. Moreover, the drug registration process is rather slow as the competent officials are authorized by law to issue a certificate of pharmaceutical product at their discretion.

5) TTM knowledge/wisdom protection structure focusing on legislation of secondary laws for protecting and managing TTM wisdom and herb databases

5.1) Important situation

The protection of TTM wisdom or knowledge in this report is confined to actions prescribed in the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999), or 1999 TTM Knowledge Protection Act, covering three components: forests and herbs, knowledge, and folk healers. For this purpose, the TTM Knowledge Fund has been established under DTAM to support TTM knowledge protection and promotion with an annual budget of 100 million baht. Its aim is to push for the passing of secondary laws for this effort and primarily improve the databases of TTM wisdom and herbs.

5.1.1) **Legislation of secondary laws for TTM wisdom protection.** After the promulgation of the 1999 TTM Knowledge Protection Act, the MoPH has enacted 20 secondary laws including 7 ministerial regulations, 12 ministerial notifications, and 2 regulations of the Committee on TTM Knowledge Protection and Promotion. The most recent secondary law enacted is related to the protection of national Thai drug formulas, as in the past, many items of TTM wisdom were exploited or stolen by foreigners for commercial purposes, while Thailand had no law on IP and TTM protection. The existing IP law system does not cover TTM wisdom that has been passed down for generations, especially Thai drug formulas and TTM textbooks, which are of interest to foreigners as they expect the things will have huge economic values and can be further extended for industrial use.

5.1.2) **More than 100,000 items of TTM wisdom or knowledge and more than 100,000 TTM personnel have been registered.** As of 2016, as many as 167,712 items of TTM wisdom have been registered, including 159,745 Thai drug formulas and 7,967 TTM textbooks. The collection has been made on the names of textbooks without any analysis on the personal formulas or texts, whereas there

are 154 national TTM textbooks and 12,125 national Thai drug formulas that have been notified as national Thai drug formulas and TTM textbooks, see Table 5.3.

Besides, a registry of TTM personnel has been set up, for example, for TTM practitioners through the Provincial Registrar's system. As of 2016, there are 57,831 folk healers and 3,035 herb growers or processors, see Table 5.2.

5.1.3) **Revision of Thai drug formulas and TTM textbooks and development of digital TTM knowledge system.** Today the development of digital TTM knowledge information system has been ongoing, including the recording of national textbooks or scriptures that have been revised such as Pharmacy Scripture of King Narai (*Khamphi Thart Phra Narai*), palm-leaf version, containing 81 drug formulas (*tamrab*) and 98 preparations (*khanan*); Revision and coding of *Ruesie Dutton*, 80 postures and 82 bodies (ton); and 60 pictures showing Thai massage of Wat Pho. However, the operation is rather slow as there are a few personnel who are competent in transcribing, interpreting and revising the old TTM textbooks, a lot more of which remain to be done; and computer experts who can do the data system development continuously are lacking.

5.2) Important situation

5.2.1) **The number of forest or wild herbs taken for producing Thai drugs or single herb drugs has been declining to the critical level.** Over 100 years ago, Thailand was recognized as the origins of natural resources including abundant plant varieties and biological resources as well as diverse culture and local wisdom. In particular, there were plenty of herbs and TTM-indigenous or folk medicine that were used in line with traditional Thai ways of life. It was estimated that about 800–1,800 herbs were known to the community and used in daily life. However, the most recent situation report shows that more than 100 herbs are endangered (or near extinction); at least 50 are rare herbs such as *thaowanpriang kamlang-wua-thaloeng, jettamulphloeng*, black lily or *nera-phusi*, *hor-saphai-khwai*, *kamlang-suea-khrong*, *sabu-luead, sa-moh* (all kinds), *pha-ya-rakdam*, and *sae-ma-lai*, and commonly used herbs such as *kwao-khruea-khao*, *jan-khao*, and *jan-daeng*. Such endangered medicinal plants are nearing extinction as a result of higher demand for natural herbs and loss of original herb areas due to the encroachment on forest conservation areas

5.2.2) **TTM knowledge management has not been handled systematically.** Meanwhile, some of such knowledge or wisdom was exploited or stolen. In the past, there were no systems for handling TTM knowledge management; most knowledge was passed down from the folk healers to their family members from generation to generation. As most healers were elderly persons, a lot of the knowledge was lost with their death. In the meantime, TTM wisdom ad herbs were not seriously protected, whereas foreigners were searching for new drugs using modern scientific and technological methods, resulting in some TTM wisdom or herbs being stolen. Examples are the cases of jasmine rice (*hom mali rice*), *plao-noi*, mangosteen, *kwao khruea* and body-stretching (*Ruesie Dutton*)

5.2.3) **The database for TTM and Thai herbs has not been systematically and properly managed.** At present, data on TTM and Thai herbs are scattered in various agencies with no agency directly responsible for this matter, especially in collecting, analyzing and managing data so that they will become a national data centre for use across the country. Even though DTAM has actually launched the IT system in setting up a digital TTM knowledge bank, or a Thai Traditional Knowledge Library, to promote the use of the knowledge bank and the easy access to such data, setting the data in English to show the evidence of original knowledge (prior art), for TTM protection at the international level, such actions are still in the beginning stage, not much progress has been evident.

5.2.4) **The moves for TTM wisdom protection require participation in all aspects.** The participation required ranges from public or community participation in the conservation, monitoring and protection of TTM wisdom, especially the support for the recording/transcribing of community or folk healers' knowledge, the translation of local drug formulas and textbooks, and the monitoring of herbal theft from their origins in the communities for use illegally and inappropriately.

7.3 Guidelines for TTM reforms towards sustainability

7.3.1 The linkage between national strategy and TTM reforms. The analyses of future trends as well as the situations and problems in sections 7.1 and 7.2, together with the brainstorming of relevant public and private agencies, have shown that it is extremely essential to reform the TTM system. This is to promote and ensure the high quality and standards of TTM practice and services, TTM and applied TTM practitioners (TTM and ATM practitioners) and Thai drugs and herbal products, according to the WHO guidelines. The aim is to ensure that TTM services are reliable for people's health care in the national health-care system, and research and development (R&D) efforts on Thai herbs can create additional values and incomes for all concerned in the production chain. This will result in the economic stability of the community and country.

The reforms of the national TTM and herbal drugs system cover three objectives as follows:

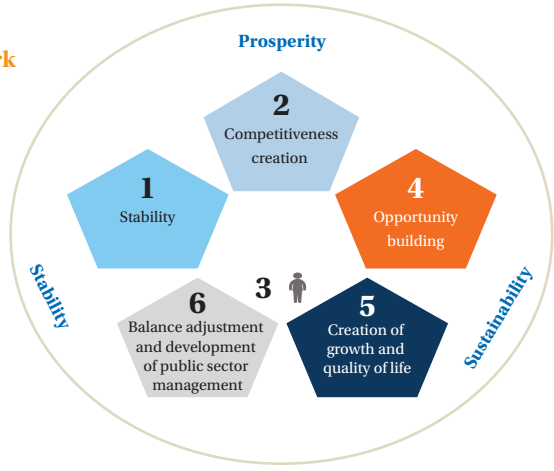
1) To create stability and self-reliance for the TTM system by improving the quality and standards of TTM, protecting TTM wisdom or knowledge as national legacy, ensuring TTM services with safety, efficacies, and standards along with the modern medical system, making it become a key service system at the primary care level, and revising TTM knowledge protection mechanisms for it to become Thai and world heritage.

2) To establish prosperity for the Thai economy with Thai herbs according to the creative economy guidelines by reforming the research system for herbal drug industry and marketing and developing TTM wisdom and herbal drugs for the world market.

3) To create sustainability by reforming the system for TTM and herbal drug management by reforming the management structure and mechanisms for TTM services, TTM education, TTM personnel development, and laws related to herbs and health products.

National strategy:
Long-term development framework

Vision:
Being a country with stability, prosperity ad sustainability



It is noteworthy that the issues for TTM reforms are consistent with the vision of the 20-Year National Strategy, i.e. "**Thailand becomes a country with stability, prosperity and sustainability, and a developed country through development based on the sufficiency economy philosophy**". Under this vision, the TTM development framework is to enhance the country's progress and people's well-being, focusing on income generation and secure livelihood with economic prosperity and higher competitiveness. This will help improve people's property, income and quality of life continuously and sustainability, not over-using natural resources.

In this regard, the details for TTM reforms, in line with the 20-Year National Strategy, are as described in section 7.3.2, which all agencies concerned have to follow in designing their national development strategic plans as well as action plans for each ministry and locality. According to such plans, the allocation of national budget and other resources will be made to drive the development efforts with unity to achieve the goals.

7.3.2 Guidelines for TTM reforms in line with the National Development Strategy

1) Reform the TTM service system so that it is safe, efficacious and standardized, along with the modern medical services

1.1) **The major issues for TTM service reforms are to develop TTM** so that it is reliable or trustworthy for the people. The service system is to be self-

sufficient and self-reliant with a lower health-care cost as it is provided along with the modern medical service system. The people must be able to conveniently access such care. Regarding the creation of TTM's trustworthiness, importance must be given to the raising of TTM service standards across the country with referrals to/from the multidisciplinary health team. The Thai pharmaceutical system has to be developed by increasing the number of herbal drugs in the National List of Essential Medicines and offering TTM services under all health insurance schemes. Other development efforts should made on enhancing personnel capacity in TTM clinical research, service quality assurance, health service/management system development, health-care disparity reduction, and elderly care.

1.2) Operational guidelines

1.2.1) **Support TTM hospitals to serve as a model of TTM services in both central and provincial administrations.** The application of the Thai Traditional Medicine & Integrative Medicine Promoting Hospital Standard at TTM units of MoPH's health-care facilities requires R&D in this regard; and learning centres have to be set up. Thus, model TTM hospitals have to be developed to provide good-quality services, serve as learning centres, ad transfer the experiences in service delivery at the central and provincial levels.

1.2.2) **Develop and have in place TTM services along with modern medical systems at all state health-care facilities and those under local government organizations (LGOs)**. TTM services are to be provided at OPD clinics on a parallel basis with modern medical services for the people to choose and under all health insurance systems (UCS, CSMBS, and SSS) in a full-cycle and integrative manner. Such services also include chronic and palliative care for elderly and home-bound patients.

1.2.3) **Develop TTM as mainstream services at primary care units**. This is for the people to care for themselves and their families before going to a higher level of state health-care facilities. For such purposes, the state has to provide adequate funding, workforce

Related national strategic framework
Strategy for creating equal opportunity and social equality includes the following important guidelines for TTM reform: ◅ Creating stability and reducing economic and social disparities ◅ Developing health-care and management systems ◅ Creating healthy environments and innovations for livelihood in the ageing society

and premises as well as a suitable linkage with tertiary care facilities to create confidence for the people and cut health-care spending of the people and the state.

1.2.4) **Establish a system for the implementation of the TTM and Thai massage service** standards at all heath-care facilities and massage venues throughout the country.

1.2.5) **Set a policy to promote the use of herbal drugs** that have been proved to be effective by research such as *Jan-ta-leela* for paracetamol, *Sahasthara* for anti-inflammatory drugs and turmeric for antacids.

2) Reform the protection of TTM wisdom as Thai and world heritage

2.1) **The major issue of the TTM wisdom protection reform** is the development of the information system of TTM wisdom and Thai herbs as well as personnel to cope with international herb activities. The efforts are in line with the framework of the National Strategy regarding the conservation, restoration and protection of natural resources.

Related national strategic framework
Strategy for creating growth and environmentally friendly quality of life includes the following important guidelines for TTM reform: ◅ Establishing systems for the conservation, restoration and protection of natural resources

2.2) Operational guidelines

2.2.1) **Develop the information system as a centre of information with acceptable standard that is able to link to other relevant agencies by:**

(1) Creating data and information in both Thai and English languages with international standard codes that are linked to other countries for the purpose of wisdom and herb protection, especially endangered species, and undertaking further research to generate knowledge of health care and for Thai economic promotion.

(2) Developing the Thai Traditional Digital Knowledge System Library (TTDKL) in both Thai and English under the supervision of an expert.

2.2.2) **Recognize masters or teachers of Thai indigenous medicine, or folk healing,** by holding a national outstanding folk healers contest, making announcements of their prestige, and publicizing their contributions through various media channels such as television, radio, newspapers, and the Internet.

3) Reform the herb industry and marketing towards global competition

3.1) **The issues of herb industry and marketing reform** for boosting the economy, enhancing competitiveness and becoming self-reliant regarding herbal medicines involve the reform of regulatory agencies and the promotion of production, transformation and innovation. The aim is to develop herbal products on a commercial scale for export to the world market. That is in line with the major framework of the National Strategy for enhancing competitiveness and raising the value chain, essentially the development of the agricultural sector (upstream), the business operators (mid-stream) and the market promotion (downstream) for Thailand to become a health-care hub.

Related national strategic framework

Strategy for creating and enhancing competitiveness and sustainable development includes the following important guidelines for TTM reform:

- Economic development: Boosting the economic capacity towards becoming a trading nation to benefit from the value chain in the region and to rise to a higher level of the value chain.
- Agricultural development: Strengthening the agricultural sector's production foundation to be sustainable, enhancing the sector's competitiveness, promoting small-scale farmers to adopt sustainable and environmentally friendly agriculture, strong farmers groups for occupational development, and the development of agricultural and food products that are of high potential, good quality and naturally safe.
- The service sector: Developing the service sector by expanding the service base to be diverse, excellent and environmentally friendly, raising the level of services that are the old income bases such as tourism so that Thailand will become the centres of health care, financing services, and other high potential services.
- The community operators and economy: Developing business operators and economy at the community level through capacity building of operators, raising the labour productivity, developing small- and medium-sized enterprises (SMEs) towards international market, and strengthening community enterprises and farmers' institutes.

3.2) Operational guidelines

3.2.1) **(Upstream) support and promote the cultivation of and research on herbs using the Good Agriculture and Collection Practices (GACP)** by the Ministry of Agriculture and Cooperatives and the Royal Forest Department. The people are to be allowed to collect herbs in forests and encouraged to plant herbs to replace the collected ones, propagate herb varieties, and grow more herbs in the forests. That is for the forests to become the origins of herbs of the country and to help resolve the problem of raw herb scarcity. They are expected to collaborate with the Ministry of Science and Technology in designing a Master Plan for Research on Herb Products, and with the

Ministry of Interior in managing or designating certain land areas in each province for promoting herb cultivation, developing community products under the OTOP (One District One Products) policy and SMEs, and promoting the sales of herbs as crash crops of each province.

3.2.2) **(Midstream) promote the establishment of a raw material processing or transformation in the community.** There should be sufficient facilities for the radiation of agricultural produce and finished products by the Ministry of Industry, and production sector support by the Board of Investment (BOI). The DTAM has to cooperate with the Thai FDA in developing Good Manufacturing Practices (GMP) for herbal products including Thai drugs and herbal health products.

3.2.3) **(Downstream) promote the marketing of products and trade exhibitions and create a Thai herb brand**. Regarding Thai herb industry, promotion efforts should involve the production technology, R&D for creating knowledge about Thai drug and herbal product development, and the creation of the environment that enhances the industrial capacity for producing Thai drugs and herbal products, for example, revising rules and regulations that hinder industrial development, creating an information system for industrial development, and promoting investment and financing.

Concerning the marketing development, in cooperation with the Department of Export Promotion of the Ministry of Commerce, efforts should be aimed at marketing promotion, trade exhibitions, creation of a brand of national herbal products, seeking marketing opportunities within the country and abroad. That is based on the creative economy principles together with the Ministry of Tourism and Sports, exploring sales outlets, producing sales promotion movies, and creating a linkage with tourism to be a Wellness Hub.

3.2.4) **Conduct R&D on producing herbal "Product Champions" on a full-cycle scale**. This effort involves technology transfer, knowledge promotion, and standard certification in the agricultural and industrial sectors to boost competitiveness in the world market.

3.2.5) **Accelerate the development of standards for herbs and drug formulas in the form of "monograph".** This is to create the acceptance of herb qualities and promote herb business and industry that stimulate

economic growth through collaboration among the Department of Medical Sciences, DTAM and networks of higher educational, research and technical institutions or agencies.

3.2.6) **Develop centres for promoting human subject research using Good Clinical Practice (GCP) and Good Laboratory Practice (GLP) guidelines.** This is to support the herbal drug industry especially regarding the assessment of drug efficacies, safety and qualities to raise the acceptance of products and promote the growth of the industry through collaboration among the Department of Medical Sciences, DTAM and networks of higher educational, research and technical institutions or agencies within the country and overseas.

3.2.7) **Establish a Pharmaceutics Centre to support the herbal drug industry**. The aim is to modernize traditional drug formulas by adjusting dosage forms through the use of modern pharmaceutical technology, developing herbal extraction technology, and developing GMP through collaboration among DTAM and networks of faculties of pharmacy as well as other relevant higher educational, research and technical institutions or agencies within the country and overseas.

3.2.8) **Establish a Traditional Medicine Engineering Centre.** The centre's aim is to support the herbal drug industry regarding the use of a production control system through collaboration among DTAM, the Agricultural Engineering Research Institute under the Department of Agriculture, Ministry of Agriculture and Cooperatives, and networks of faculties of pharmacy as well as other relevant higher educational, research and technical institutions or agencies within the country and overseas.

4) Reform the systems for research and knowledge management on TTM wisdom and herbal drugs towards national drug and economic security

4.1) The reform issues on research and knowledge management related to TTM wisdom and herbal drugs. The aim is to really use the TTM wisdom from the upstream through midstream and downstream stages, including the development of herbal drug industry to ensure national drug and economic security. In this effort, it is essential to have a strategic plan for developing herb production industry in a full-cycle manner, in line with the national development

strategy and other relevant strategies, such as the strategy for herbal drug system development and the strategy for Thailand to become a Medical Hub. This is in line with the national strategy to make Thailand become a health-care centre. These strategies are to be mobilized consistently in the same direction concerning the development of raw herb origins, production standards, herb transformation, and quality control of herbs and herbal products according to the GAP requirements, and the herbal drug production according to the GMP guidelines.

As for research reforms, efforts are to focus on enhancing R&D capacity in herbal drug development so as to create new herbal drugs and herbal drug formulas to replace imported drugs. Then Thailand will become self-dependent in the long run and have a higher competitive capacity with economic value addition. Besides, importance is to be given to R&D on developing TTM wisdom to create additional values for herbal products other than herbal drugs, for example health supplements or cosmeceuticals or nutraceuticals with good quality and safety.

4.2) Operational guidelines

4.2.1) **Adjust a wisdom-based research process to shorten the research timeframe.** The aim is to resolve national health problems and create economic values through jointly designating herbs specifically for developing national herbal products and assigning responsibilities to different agencies.

4.2.2) **Design a strategic plan for R&D on developing herbal products with economic values for Thailand.** This effort is to be made through collaboration among all relevant agencies including the Thailand Centre of Excellence for Life Sciences, the National Research Council of Thailand, MoPH's drug and herb research centres, the Government Pharmaceutical Organization, the Defence Pharmaceutical Factory, educational institutions and the private sector, in drawing up a strategic plan for R&D on developing herbal drugs and products. The plan will be a national mechanism for directing joint herbal drug R&D efforts, based on each agency's capacity with synergies in a concrete manner.

5) Reform the TTM educational management system to improve its quality

5.1) The issues for TTM education reform deal with the improvements in the curriculums, educational management, professional practical training,

restoration of traditional medical wisdom, old textbook/formula verification/revision, and the transcription of folk healers' knowledge. The focus is on the revision of TTM textbooks, the development of textbooks for use in the TTM educational or training programmes, the development of curriculums and educational or training processes, the development of practical or clinical training sites, the Thai massage training systems, and public education on herbs and herbal drug use. This is in line with the national development strategy that aims to raise the educational and learning quality on an equal and thorough basis.

At present, some TTM personnel begin working in the Thai health system, but the numbers are insufficient to widely integrate TTM services into the national health-care system. A certain number of such personnel are not confident in providing diagnostic and therapeutic services as they did not have adequate clinical experience during their formal educational programme. Thus, it is necessary to have suitable practical training sites for TTM students so that they can gain enough clinical practice experiences. Educational institutions have played a role in producing TTM workforce, but many of them cannot have enough practical training facilities at their own institutes. So they need to seek help from TTM units of MoPH's hospitals. However, TTM services are not widespread and many members of the multidisciplinary health team do not understand the TTM system as it was not included in the state health-care system for over eight decades.

5.2) Operational guidelines

5.2.1) **Review/revise TTM textbooks** with the aim of reviving the TTM theoretical principles on Thai medicine, Thai pharmacy, Thai massage and Thai midwifery. This is to create clarity and efficiency in the TTM clinical practice by accelerating the transliterating or transcribing ancient TTM scriptures and textbooks, and then getting them reviewed and revised by TTM experts so that they can be used in improving the teaching and learning programmes.

5.2.2) **Develop textbooks for use in the TTM instruction.** The aim is to conserve and preserve TTM knowledge, and integrate the knowledge of Thai medicine, Thai pharmacy, Thai massage and Thai midwifery, both therapeutic and health promotion aspects, into the educational system for producing TTM and ATM practitioners.

5.2.3) **Revise TTM curriculums and education/training programmes for strengthening TTM workforce production efforts**. The aim is to ensure that all categories of TTM personnel under Section 12(2) of the 2013 TTM Professions Act will qualify as per the professional standards and have the capacity to carry out TTM development functions. This is to be done through the collaborative efforts of TTM educational institutions and the TTM Council.

Related national strategic framework
Strategy for enhancing workforce capacity includes the following important guidelines for TTM reform: ◂ Raising the quality of educational and learning programmes in an equal and thorough manner.

5.2.4) **Develop professional clinical training sites** through the provision of subsidies for higher educational institutions to recruit an adequate number of TTM or ATM practitioners to work with existing personnel in improving the clinical teaching and learning efforts. This is to also enhance the capacity in supervising the mentors at professional clinical training sites through collaborative efforts between educational personnel and DTAM officials in improving TTM services at state hospitals and those under local government organizations. This will strengthen the capacity of professional clinical training sites for TTM students and develop the networks of TTM personnel of all categories under Section 12(2) of the 2013 TTM Professions Act.

5.2.5) **Develop professional clinical training sites** to support the integration of TTM services into the modern medical system.

5.2.6) **Develop Thai massage training systems as per the established standards** in response to the needs for Thai massage services within the country to ensure confidence among Thai and foreign clients.

5.2.7) **Revise the educational systems of TTM, Thai massage and herbs** by including the subject of basic TTM and herbs in the basic educational curriculums for primary and lower secondary students so that they will love and cherish the national culture and use it for health promotion and preliminary self-care.

5.2.8) **Provide basic knowledge for the people about herbal drugs and TTM** for preliminary self-healthcare in every family.

6) Workforce development reform

6.1) Issues in workforce development reform. The aim is to respond to the work related to TTM and herbs including herb farming, researchers, herbal pharmacists, international affairs, standard control, registration laws, and TTM wisdom and herb protection. In line with the ASEAN Economic Community (AEC) and global forum requirements, importance is given to workforce development, especially clinical research, information and training of Thai masseurs according to international standards. This is consistent with the national development strategy that aims to develop the workforce management system and the public sector personnel.

6.2) Operational guidelines

6.2.1) **Develop clinical research workforce** by promoting the role of medical personnel, TTM practitioners, herbal pharmacists, and other multidisciplinary team members in improving the quality of herbs and herbal drug formulas in response to the need in the herbal drug and product industry.

Related national strategic framework
Strategy for adjusting the balance and developing public sector management system includes the following important guidelines for TTM reform: ◅ Developing the workforce management system and the public sector personnel.

6.2.2) **Develop information workforce** in preparation for the development of herb standards and textbooks to enhance the competitive capacity and wisdom protection in the AEC and international forums.

6.2.3) **Develop the standards of Thai masseurs** to become massage teachers and assessors of Thai massage standards within the country and other countries all over the world.

7) Reform the structure and mechanism for integrative TTM management

7.1) Issues of structural and mechanism reform. The aim is for all relevant sectors to carry out the integrative effort in the same direction by setting up a National Steering Committee on TTM and Herbal Drug System and revising the existing mechanisms, i.e. the Department of Thai Traditional and Alternative Medicine (DTAM), the TTM Council, and the Food and Drug Administration (FDA).

7.2) Operational guidelines

7.2.1) **Establish the Steering Committee on National TTM and Herbal Drug System.** In practice, the implementation of the national TTM and herbal drug system has not been carried out in an integrative manner among relevant agencies, it is thus essential that all sectors (public, private and civic), join forces through the national steering committee. The aim is to solve all problems in the same direction as the committee is comprised of representatives from relevant public and private agencies. The committee has powers and duties to move forward the work on TTM reform in connection with each agency's mission and in accordance with the strategies of the National TTM and Herb Development Plan.

To undertake this effort, the Prime Minster's Office will issue a regulation appointing a "**Steering Committee on National TTM and Herbal Drug System**", comprising representatives from relevant public and private agencies and experts. The committee will be chaired by the Prime Minister or an assigned deputy prime minister and have DTAM's Director-General as secretary. Its powers and duties are to develop a work plan, manage the plan, evaluate and follow up on the operations of relevant agencies, coordinate the linkage and integrative actions of all agencies, issue laws and regulations for the implementation of the TTM and herbal drug reform guidelines.

7.2.2) **Reform the DTAM structure.** Under the three strategies on management, multisectoral coordination, and TTM personnel development, DTAM serves as the secretariat of the central unit responsible for coordinating the efforts of all ministries, sub-ministries, departments, private agencies and civic groups to take concrete actions on TTM and herb development. Its five major missions are: (1) joining forces of all agencies in overseeing the qualities of the TTM service system; (2) serving as a centre for R&D on herbal drug technology; (3) promoting and supporting the education and development of workforce for TTM, Thai massage and Thai indigenous medicine; (4) developing a national centre of data/information technology and knowledge management related to TTM and Thai wisdom; and (5) protecting and promoting TTM wisdom or knowledge.

Concerning the preparation of the structure and workforce reform plan, its budget estimates have to correspond with the personnel development effort under the AEC and international requirements. That is to be also in line

with the missions of DTAM and the TTM Knowledge Fund. Other actions include the adjustments of the role of the Traditional Thai Medicine Research Institute related to TTM and herb research, the establishment of a national centre for data/ information technology and knowledge management related to TTM and Thai wisdom, and the protection, conservation and promotion of TTM wisdom, under the 1999 TTM Knowledge Protection Act.

7.2.3) **Strengthen the TTM Council** so that it is capable of setting the standards for producing TTM personnel and the practice of TTM and ATM practitioners according to the TTM professional code of ethics under the 2013 TTM Professions Act.

In undertaking this effort, adequate and continuous budgetary support has to be given to the TTM Council, similar to that for other professional councils. Its duties also include the development of curriculum standards and educational management procedures, holding TTM licensing examinations, developing continuing education programmes for members, and handling consumer protection issues related to TTM services and herbal drugs.

7.2.4) **Reform the registration systems at the Thai FDA**. The aim is to promote the development of innovative herbal products by setting up an advisory service unit for R&D and registration of herbal products derived from in-country studies and a unit for the registration of herbal products separated from that for other products.

In this effort, the Thai FDA has to re-process or rearrange the procedures for the registration of herbal products. This is to promote the development of innovative herbal products so that locally developed products can be registered in a timely manner in relation to the competitiveness and market demands as follows:

(1) Revise the criteria and procedures for the registration of herbal drugs and herbal products so that they are consistent with international guidelines and the ASEAN TMHS Agreement.

(2) Devise a system for giving advice on herbal product development by setting up a unit for giving information on in-country research and the registration of herbal products whose efficacies have been proved by research within the country, so that the findings of the National Research Council can be

rapidly turned into practice. This is to create a system for giving advice and the registration of herbal products derived from in-country research in a concrete manner and ensure that the herbs that have been developed on a pilot study in country can be registered rapidly with visible results in practice.

(3) Establish a basic herb information system and a herbal product information system for promoting the registration of herbal products. The system has to be accurate and efficient, and rapidly/easily accessible to the people and medical personnel for further use.

8) Reform the laws related to herbal drugs and health products. The aim is to reduce the obstacles in the registration process, advertisement control, and consumer protection, and to develop a participatory mechanism for the monitoring and warning of herbal drugs and health products that are dangerous to human health. That is to be consistent with major guidelines of the National Development Strategy that focuses on legal and regulatory reforms so that they are modern, fair and internationally recognized.

8.1) Issues in legal reforms – Laws related to Thai or herbal drugs and health products should be separated from the Drug Act and the Food Act. Other important laws should also be revised or amended so that they are up to date as Thai drugs and herbal drugs have a philosophy that is different from that of modern drugs. It has been evident that the existing regulations are obstacles to the development of Thai drug and herbal health product industries. Moreover, there have been a lot of "health claims" of herbs as the present-day communication technology can reach the people rapidly and negatively affect consumers, which cannot be dealt with efficiently by the government system.

8.2) Operational guidelines

8.2.1) **In the urgent stage, revise secondary laws including ministerial regulations and FDA's notifications on herbal drug registration.** The revised laws or regulations should allow the notification or detailing, rather than registration, of herbal drugs, especially single herbal drugs that have been registered, or herbal drug formulas in the National List of Essential Medicines, or other drugs that are specified by the Committee on Herbal Drugs and Herbal Products. This is

in line with the diversity of competition, wisdom, context and culture of new herbal drugs and herbal health products that will be developed.

8.2.2) **Push ahead with the draft Herbal Products Act B.E. ...,** aiming to resolve the problems related to the registration of herbal health products, claims of their properties, drug production model, and pre- and post-marketing monitoring, so that the wisdom control, consumer protection and competitive capacity enhancement can be efficiently undertaken.

8.2.3) **Amend the Protection and Promotion of Thai Traditional Medical Knowledge Act, B.E. 2542 (1999)** by revising the composition of the Committee, DTAM's powers and duties, the financial and asset management mechanisms of the TTM Knowledge Fund, the actions related to official documents or permits, penalties, and fees. That is because the 1999 TTM Knowledge Protection and Promotion Act, which is currently in effect, is not suitable to the current situation and rapidly changing social context and fierce economic competition.

8.2.4) **Establish and develop a system for risk management of herbal products that are dangerous for human health**.

(1) Set up a monitoring system and cooperation networks of relevant agencies in dealing such problems, such as the networks of consumers and entrepreneurs, the National Broadcasting and Telecommunications Commission (NBTC), and the Ministry of Information and Communication Technology.

(2) Provide consumers and officials with the access to the information to choose various kinds of products, based on the quality and safety of herbal products.

(3) Revise regulations and laws for efficient management of dangerous products and unsuitable advertisements, such as the draft Herbal Products Act B.E. ....

(4) Set up a post-marketing monitoring system with strict control mechanisms and harsh penalties.

8.2.5) **Establish a participatory monitoring and warning system** to disseminate the information on adverse effects of herbal drugs and products, based on technical evidence in relation to the negative impacts that have occurred in a neutral manner.

7.4 Conclusion

The aforementioned TTM reform guidelines have been developed through various steps of careful and participatory reviews and syntheses of relevant information to ensure the consistency with the 20-Year National Strategy. Thus, they are regarded as TTM development guidelines that are suitable for the current situation and future trends, and responsive to various problems that primarily hinder the development and integration of TTM services for the Thai people along side the modern medical system.

Importantly, the guidelines will be a roadmap for all relevant agencies to use in designing their specific TTM and herb development plans as well as action plans at the ministerial and local levels, which are expected to incorporate such guidance in their plans, projects and activities. Such plans will be useful for budget allocation in the same direction through integrative efforts and joint resource utilization in a cost-effective and efficient manner. The ultimate goal is to drive TTM development with unity to achieve its goal and national development vision of “Stability, Prosperity and Sustainability” in the future.



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Thai-English Translation

(Thai Official Emblem)

Order of the Department of Thai Traditional and Alternative Medicine
No. 488/2558 (2015)
Subject: Appointing Committee on Preparing Thai Traditional and Alternative Health Profile, 2014–2016

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As the Department of Thai Traditional and Alternative Medicine (DTAM), Ministry of Public Health (MoPH), has launched a project to prepare a report, "Thai Traditional and Alternative Health Profile: Thai Traditional Medicine, Indigenous Medicine and Alternative Medicine 2014–2016", aiming to collect, analyze and synthesize the data and information about Thai traditional, indigenous and alternative medicine in Thailand during 2014–2016 and to prepare a manuscript of the report. Important analyzed and synthesized data will be developed as information for use as technical references in the Thai and English languages. The report preparation will be a process for developing a data networking system on Thai traditional, indigenous and alternative medicine.

Thus, to achieve the aforementioned purpose, the Committee on Preparing "Thai Traditional and Alternative Health Profile 2014–2016" is hereby appointed with the composition as well as powers and duties as follows:

1. Composition

1)	Mr. Vichai Chokevivat, Director, Institute for Development of Human Research Protection	Advisor
2)	Mr. Prapoj Petrakard, Senior Advisor for Public Health (Medical Service System Development)	Advisor
3)	Mr. Thavatchai Kamoltham, Director-General, DTAM	Chairperson
4)	Mr. Papassorn Chemboonsri, Deputy Director-General, DTAM	Vice Chairperson

5)	Mr. Prasat Tradthanthip, Deputy Director-General, DTAM	Vice Chairperson
6)	Mrs. Yenchit Techadamrongsin, Alternative Medical College, Chandrakasem Rajabhat University	Member
7)	Ms. Pintusorn Hempisut, Deputy Director, Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH	Member
8)	Director, Public Sector Development Group, DTAM	Member
9)	Director, Office of International Cooperation, DTAM	Member
10)	Director, Thai Traditional and Integrated Medicine Hospital, DTAM	Member
11)	Director, Bureau of Alternative Medicine, DTAM	Member
12)	Director, Institute of Thai-Chinese Medicine, DTAM	Member
13)	Director, Division of Thai Traditional and Herbal Medicine Development, DTAM	Member
14)	Director, Bureau of Strategy, DTAM	Member
15)	Director, Division of Thai Indigenous Medicine, DTAM	
16)	Director, Institute of Workforce Development, DTAM	Member
17)	Director, Division of Technical Development and Service, DTAM	Member
18)	Director, Office of Organizational Communication, DTAM	Member
19)	Director, Division of Thai Traditional and Indigenous Medicine Knowledge Protection, DTAM	Member
20)	Director, Traditional Thai Medicine Research Institute, DTAM	Member
21)	Director, Thai Pharmacy Development Group, Institute of Thai Traditional Medicine, DTAM	Member
22)	Ms. Rutchanee Chantraket, Director, Office of Information and Knowledge Bank, DTAM	Member & Secretary

23)	Mr. Vichai Chankittiwat, Office of Information and Knowledge Bank, DTAM	Member & Assistant Secretary
24)	Mr. Wattanasak Sornrung, Director, Office of Health Regions Support and Special Projects Management	Member & Assistant Secretary
25)	Mr. Somsak Kreechai, Director, Office for Management of Thai Traditional Medical Knowledge Fund, DTAM	Member & Assistant Secretary

2. Powers and duties

1) To prepare the scope and guide of content structure of the report on "Thai Traditional and Alternative Health Profile 2014–2016".
2) To coordinate with relevant experts in writing the manuscript of each chapter of the report.
3) To examine, select and revise the content of each chapter of the report.
4) To examine the translated English version of the report.
5) To publish both Thai and English versions of the report.
6) To disseminate both Thai and English versions of the report.
7) To appoint subcommittees and working groups to prepare both Thai and English manuscripts of the report.
8) To carry out other assigned activities.

This order is effective on this day onwards.

Given on 29 September 2015



(Mr. Thavatchai Kamoltham)
Director-General, Department of Thai Traditional
and Alternative Medicine







Technical and Planning Division
Department of Thai Traditional and Alternative Medicine
Ministry of Public Health

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