

Royal Activities and International Cooperation

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Foreword

'...the well-being and happiness of the people are a benefit that is difficult to be measured in terms of money.'

Royal Speech on the occasion of the Royal Birthday Anniversary (1991)

As the Kingdom of Thailand celebrated the auspicious occasion of His Majesty King Bhumibol Adulyadej's eighty-seventh birthday anniversary in 2014, the National Identity Foundation takes great pride in presenting this exclusive publication in honour of our beloved king and members of our royal family.

The world's longest-serving monarch, His Majesty is now in the sixty-eighth year of a remarkable and noteworthy reign. From the beginning, our king has worked unceasingly to bring comfort and relief to disadvantaged people in rural Thailand. This selfless dedication, and that of other members of Thailand's royal family, has improved the lives of the country's poor and needy and, in some cases, impacted the wider world. To date, thousands of royal development projects have been initiated, all aimed at improving the livelihood and lifestyle of the people of Thailand.

From our experience at the foundation, often through overseas lectures in Europe, Australia and other parts of the world, we have encountered an element of surprise on the part of many people not previously aware of the humanitarian activities of Thailand's monarch and members of the royal family.

This exceptional publication, which portrays recently updated details of nine activities and development projects illustrating the humanitarian aspects of work undertaken by Thailand's royal family over a long period of time, has been compiled from experiences recounted by scholars, practitioners and experts all of whom have taken great pride in serving alongside our King and other members of our royal family.

It is our wish that you, as a valued, overseas friend of our country, will find this portrayal of royal activities enlightening, educational and inspirational; sufficient, at least, to allow us the pleasure of welcoming you back to the Kingdom of Thailand.

Dr Suvit Yodmani
Bangkok, December 2014

Note from the Editor

Compassion is the deep concern shown to less fortunate people through humanitarian acts of selflessness inspired by a desire to tackle poverty and alleviate human suffering. In Thailand, such actions are exemplified by His Majesty King Bhumibol Adulyadej

Thailand's royal institution, which has prevailed for almost 800 years, endures under the aegis of the Royal House of Chakri and the stalwart guardianship of His Majesty King Bhumibol Adulyadej.

A significant turning point in the country's recent history occurred in 1932 when a bloodless coup d'état transformed the Kingdom of Siam -- renamed Thailand in 1939 -- from an absolute monarchy to a constitutional monarchy, leaving the ruling monarch as a titular head of state.

By chance, constitutional reform presented a unique opportunity for the youthful King Bhumibol to interact closely with the people of Thailand. His Majesty embraced the opportunity with patience and understanding, taking great care not to impede or hinder the business of government. In due course the king earned the love and respect of both the people and government officials.

As the young King acquired more knowledge and experience, farming experiments were started in 1961. His Majesty gradually converted land at Chitralada Villa (the Bangkok residence of Their Majesties) into trial plots to seek solutions to a variety of agricultural and aqua cultural challenges raised by farmers. Crucially, many problems were soil-related because soil characteristics differed widely (from sandy to saline) across each region of Thailand. Subsequently, two pilot projects were initiated by His Majesty to improve sustainable soil management: Klaeng Din and the Royal Project. It would be years later, in 2012, that Thailand's king, pride of the nation, would receive the Humanitarian Soil Scientists Award – the first of its kind – for dedication to soil resource management.

However, it was in the earlier years of the Thai monarch's reign through subsequent excursions to the remotest parts of the kingdom that His Majesty was able to learn first-hand of the plight of marginalised people, particularly ethnic minorities. Desolate villagers, hooked and dependent on the opium trade, were eking out a living on the hillsides of northern Thailand. Indiscriminate slash-and-burn farming methods were turning large tracts of forested land into endless fields of poppies. To the farmers, poppy cultivation was essential to fulfil longstanding trade deals with unscrupulous traders -- and to feed the farmers' addiction to opium. Driven by poverty, this appeared to be their only survival option. But opium became both a means of survival and an instrument of destruction for the hill people and their environment.

Confronted by what seemed an impossible task, the king resolved to tackle poverty as the fundamental source of the hill people's hardship and, at the same time, lower their dependence on poppy cultivation. Acting with the farmers' implicit cooperation, and with help from government agencies, His Majesty set out to forge an alternative, sustainable lifestyle that could be adopted by impoverished villagers.

The king's early initiatives saw the start of a series of royal development projects beginning with the Royal Project in the northern hills of Chiang Mai and surrounding provinces. Over time, villagers were given the means to lead an alternative and legitimate livelihood growing fruits and vegetables for personal consumption and sale. It was a project of vital importance; the king's intervention almost certainly prevented a humanitarian and environmental disaster in rural Thailand.

Today, more than four thousand royal development projects, enacted over many years under the principles and spirit of humanitarianism, are well documented, thoroughly understood and greatly appreciated by everyone living in the Kingdom of Thailand. Yet they are less well-known outside the country.

Royal Activities and International Cooperation, initially released in celebration of His Majesty King Bhumibol Adulyadej's 84th birthday in 2011, and recently updated and re-released in celebration of His Majesty's 87th birthday in December 2014, portrays some of the projects inspired and nurtured by Thailand's royal family. By embarking on a journey through the pages of this unique publication, readers may gain a useful insight into the origin of these projects and the way they have impacted the livelihood and lifestyle of many people in Thailand and even in the international arena.

Nowadays, royal development projects are administered by appointed managers and teams determined to uphold the humanitarian principles established and practised by His Majesty from the beginning of his reign. The overriding objective in each undertaking is to improve the quality of life of people so they have enough to meet their needs, with additional opportunities to earn a reasonable income for their families.

Throughout his noble reign, HM King Bhumibol Adulyadej has conscientiously elevated the interests of the Thai nation above personal interests. It is not surprising therefore that the citizens of the Kingdom of Thailand believe their country's most redeeming characteristics are embodied in the altruism, concern and compassion shown over many years by their king and other members of Thailand's royal family. The monarchy stands as a revered institution whose nationwide respect and admiration has been earned as a result of tireless efforts spent improving the health and well-being of Thai people.

The small sample of royal development projects in this publication, all initiated and nurtured by members of Thailand's royal family, are presented out of heartfelt concern for the less fortunate and with infinite respect for the future of mankind.

Frank W. Skilbeck, Editor
Bangkok, Thailand, 2014

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The Royal Chitralada Projects





Experimental rice field at Chitralada Villa in the heart of Bangkok



His Majesty King Bhumibol Adulyadej's coronation May 5, 1950

THE ROYAL CHITRALADA PROJECTS

When nineteen-year-old Prince Bhumibol Adulyadej was involuntarily thrust into kingship in 1946 the world was still reeling from six years of global war that had altered the political and socioeconomic landscape.

In the Kingdom of Siam (Thailand from 1949), citizens were still adjusting to life under a constitutional monarchy and the successor to the throne was engrossed in studies at Switzerland's University of Lausanne. Wisely, the young Prince Bhumibol sought to broaden his scope of study to include law and political science in preparation for future life as a monarch.



HM King Bhumibol, HRH the Princess Mother, HM King Ananda (Rama VII) and HRH Princess Galyani



His Majesty as a young sportsman and musician



The family man



The artist King

His Majesty King Bhumibol Adulyadej (Rama IX) was officially crowned on May 5, 1950 in an auspicious ceremony that took place just one week after his marriage to MR Sirikit who, on Coronation Day, was granted the royal title of Her Majesty Queen Sirikit.

At the time of His Majesty's coronation, the people of Thailand were in no doubt that their emergent King would be suited for high office from their awareness of the young monarch's royal birthright: His father Prince Mahidol of Songkla was the son of a king (Rama V) as was his father before him (Rama IV); both monarchs were held in high esteem for having furthered their country's standing in the world. Moreover, the young King's mother, a generous, thoughtful and practical person born of humble parents and orphaned at the age of nine, had schooled her three children to be caring and charitable individuals much like herself.

Many scholars of Thai history are inclined to agree that the young King carried in his genes the fundamental, humanitarian qualities of compassion and altruism. These enduring characteristics would blend with the young monarch's love for the performing arts, competitive sports and leisure activities, and an intrinsic respect for the environment – qualities inherited from his parents.

In his earlier years, His Majesty King Bhumibol Adulyadej emulated his parents' love for life and thirst for knowledge. He excelled in sporting pursuits such as sailing, waterskiing and badminton; in photography and cinematography (inspired by his mother); in painting whether realism, expressionism or abstractionism, and as a multi-instrumentalist, music composer and arranger. Such diverse art and leisure activities provided a counterweight as the King worked unceasingly for the poor and needy people of Thailand. Today, His Majesty's selfless efforts can be measured in over 4,000 royal development projects undertaken for the benefit and happiness of the Thai people.



Agricultural experimental plots

Soon after acceding to the throne, and frequently accompanied by HM the Queen, the King made visits to remote parts of Thailand talking and listening to the people – mostly farmers struggling to make a living off the land. These visits marked the beginning of many years of important field trips.

Although quite young and with limited practical experience, His Majesty was astute enough to realise that the people's problems should not be addressed by showering them with money in acts of charity. On the contrary, the King wanted something much more far-reaching and long-



The cheese plant at Chitralada Villa uses equipment presented to the King by the government and people of the Netherlands



lasting. Subsequently, following the humanitarian principles embraced by his parents, the young King Bhumibol resolved to find a way to empower the poor and marginalised people of Thailand to solve their own problems. This meant equipping them with greater knowledge, combating health problems, teaching appropriate skills and offering employment opportunities. The King was about to embark on a lifelong journey that would help less fortunate people emerge from poverty and become self-reliant.

Starting from 1961, His Majesty gradually transformed part of an extensive area of palace land at Chitralada Villa (Their Majesties' Bangkok residence) into experimental plots from where the King found solutions to a variety of agricultural problems affecting farmers.

Looking back over the past fifty years, there were many great progresses from agricultural, aquacultural studying and animal husbandry including more experiments in alternative energy. It is clear to anyone who goes there that the Royal Chitralada Projects are still a vibrant “work in progress” as new projects are added, each one aimed at improving people’s livelihood both at home and abroad.



Non-commercial and semi-commercial projects

From the start His Majesty adhered to the principle of making available to the public valuable knowledge and experience accumulated from development projects in the grounds of Chitralada Villa. While the projects did not set out to be profit-orientated, they were either non-commercial or semi-commercial by their nature.

Non-commercial projects initiated by the King are geared towards improving agricultural productivity that can bring about long-term improvements to the livelihood and lifestyle of farmers and help them become self-sufficient while conserving Thailand's natural resources. Such projects receive support and guidance from government agencies and private sector business entities.

Conversely, semi-commercial projects requiring studies and experiments to find suitable methods for processing agricultural products do result in the finished products being sold. However, any surplus funds from the sale of products are ploughed into further development.



Profits from the sale of products are invested in future developments





His Majesty and the Crown Prince driving the "iron buffalo" in a demonstration field at Chitralada Villa



Rice for food and energy

Rice was one of the first agricultural crops studied at Chitralada Villa to find the best cultivation methods to recommend to farming communities. In preparation, His Majesty requested that different strains of seed be gathered from all over Thailand for testing.

Each May, prior to the rainy season, the best strains are used in the Royal Ploughing Ceremony which is a Brahman ritual originating in the Sukhothai Era (1238-1438) when it was believed the ceremony guaranteed a plentiful harvest. It was discontinued in the early part of the 20th century and revived by His Majesty in

The Royal Ploughing Ceremony takes place each May at Sanam Luang



His Majesty normally presides over the Royal Ploughing Ceremony

1960 at a time when more than eighty percent of the population worked in Thailand's agricultural sector.

Even today, with half of Thailand's population still dependent on farming for a living, the Royal Ploughing Ceremony carries great significance nationwide. It not only inspires farming communities to work for an abundant harvest but also reinforces the bond between HM the King, the Royal Thai Government, and the farmers whose efforts help sustain the country.

Normally presided over by HM the King, the Royal Ploughing Ceremony takes place at Sanam Luang, a public square in front of the Temple of the Emerald Buddha (Wat Phra Kaew) and the Grand Palace in Bangkok. The rice seeds cultivated

on experimental plots of the Royal Chitralada Projects are brought to Sanam Luang and sown into a furrow ploughed by two oxen hitched to a wooden plough. At the completion of the ceremony farmers will go to great lengths to obtain samples of the rice seeds cultivated at Chitralada Villa which they consider the best seeds available for their own use.





His Majesty and the Crown Prince sowing rice in an experimental field of the Royal Chitralada Projects, July 16, 1961



Rice is the country's staple food and Thailand is one of the world's leading rice-exporting countries. Hence, a good harvest ensures sufficient rice for domestic consumption, improves export prospects, and provides adequate reserves for humanitarian aid in countries that encounter natural disasters. In the early part of 2010, for example, Thailand was able to assist earthquake survivors in the Caribbean country of Haiti by donating 200,000 tonnes of Hom Mali rice.

In keeping with the King's "waste not, want not" approach to life, a number of methods have been studied over the years to make the best use of rice as a staple food and to utilise any by-products to minimise waste. For example the grinding plant at Chitralada Villa compresses and heats rice husks into briquettes that can be used as an alternative source of energy in industrial plants and factories.



Rice cultivated for food and energy purposes



Different strains of rice in experimental fields at Chitralada Villa in the heart of Bangkok

Dr Rosarin Smithabhindu, Policy and Planning Analyst of the Royal Chitralada Projects who has spent over thirty years at Chitralada Villa spoke about rice production. “We have forty-nine different varieties of rice in the grounds for experimentation purposes. About half of the crop is used as rice seeds for human consumption but another twenty percent, mainly the husks, are compressed into bricks and sold to factories for three baht a kilo.”

After a second round of heat-treatment, the husks are further compacted into charcoal for factory use, another energy by-product replacing the need to fell trees for firewood purposes. “As you can see, rice is more than just food – it’s also an energy source. Incidentally, His Majesty has a preference for brown rice because of its high quotient of vitamin B”, Dr Rosarin explained.

Working in conjunction with the Electricity Generating Authority of Thailand, the country’s main utility providing electric power, and the Fund for the Promotion of Energy Conservation, another Royal Chitralada project captures heat generated by burning rice husks to produce hot water that is converted through an absorption system into chilled water used to operate the air-conditioning units at the visitors’ reception hall in the royal Chitralada Projects. Chilled water is also at a controlled temperature for the study of cold-climate mushroom culture.





His Majesty and HRH Princess Maha Chakri Sirindhorn inspecting Suan Dusit Milk Powder Plant

Milk and its many by-products

Chitralada Dairy Farm marked the start of semi-commercial projects after the King was presented a few heads of cattle in 1962. His Majesty also invested his personal funds and even sold a book he wrote on music to raise additional funding for a dairy herd of around forty cows for demonstration purposes. The herd produced between 200 and 300 litres of milk a day.

Similar to the rice development project, Dr Rosarin explained that His Majesty was concerned that there should be no wastage from milk production. There were surpluses in the milk market in 1969 and His Majesty asked for studies to turn fresh milk into powdered milk that could be stored for long periods of time. This resulted in Thailand's first milk powder factory, designed and constructed entirely by Thais and given the name "Suan Dusit Milk Powder Plant" by the King.

Milk tablets were produced from milk powder. Any broken tablets were gathered, recycled and given to pets. Apart from this, the pure condensate obtained through the process of evaporation can be converted for use as distilled water in car batteries.

Coinciding with His Majesty the King's sixtieth birthday in 1987 a cheese plant was established at Chitralada Villa using cheese production equipment presented to the King by the Royal Netherlands Embassy on behalf of the government and people of the Netherlands. Apart from producing "Maha Mongkol Cheese", the name given to the product by HRH Princess Maha Chakri Sirindhorn, the cheese plant turns out ice cream, low-fat drinking yogurt, butter and sweetened condensed milk.





The cheese plant also produces ice-cream, yogurt, butter and condensed milk

Milk surpluses in the market at the end of 2002 prompted the Royal Chitralada Projects team to set up a UHT milk plant. It was to help dairy farmers as well as demonstrate the process of manufacturing from fresh milk because UHT milk can be stored for a long time without refrigeration. Long-life milk is also sold to the general public, and schools that participate in the Royal Thai Government's school milk project.

The Borrow Foundation

The Borrow Foundation is a United Kingdom Registered Charity. It is a non-profit making organisation, dedicated to the improvement of oral health, particularly in children. The Foundation work closely with the World Health Organisation (WHO), with the primary focus being on the prevention of dental disease. The Foundation have been pleased to support the development of milk fluoridation programmes in various parts of the world, including Thailand where the collaboration with the Department of Health has assisted provincial health authorities to implement this important dental public health measure.

Farmers have often been described as the backbone of Thailand and the vision and leadership of His Majesty King Bhumibol Adulyadej in the advancement of agriculture has been profoundly important to those whose livelihoods depend on the land. This has been a major goal in to His Majesty the King's lifelong mission to improve the welfare and quality of life of the Thai people.



One of many areas of agriculture in Thailand that has flourished is the dairy industry and again this can be attributed to the tremendous foresight of His Majesty the King, who in the early 1960s, together with King Frederick 1X of Denmark, inspired the development of the Thai-Danish Dairy Farm. Around the same time His Majesty presided over the opening of the Suan Chitralada Dairy Farm. These were major steps for dairy farming, advancing the manufacturing and processing technology and thereby enabling substantial growth in milk production. Thailand now has a well-established dairy industry and importantly, children throughout the country receive the nutritional benefits from milk which is supplied free of charge under the national school milk programme. It is this impressive programme that has provided a “vehicle” for the delivery of fluoride to children in those communities where, in accordance with the WHO guidance, there is a clear need for this intervention.

It was at the Royal Chitralada Projects where fluoridated milk was first produced in Thailand. The Royal Chitralada Dairy continues to supply such products and provides a working demonstration of the robust systems and standards established in Thailand for production and quality control. This has provided an excellent ‘model’ that has been replicated in numerous dairies around the country, and the very high standards achieved have ensured that the programme is built on strong foundations. The benefit of fluoridated milk has now been extended to more than 1,000,000 children.

Staff at the Royal Chitralada Projects continue to play a vital role in the programme as the dairy processes and technology applied in the programme evolve. In line with the vision of His Majesty the King, the knowledge and experience gained from this work is disseminated through the ongoing training and guidance provided by this centre of excellence to the numerous other dairies engaged in this important dental public health initiative. The expertise of the staff has also contributed to the development of milk fluoridation programmes elsewhere in the world, and to the formulation of guidelines published by the WHO for the implementation of further programmes.

Those of the Foundation who have had the great honour and privilege to have worked with the Royal Chitralada Projects have been deeply impressed by the essential work that is being undertaken there. The Foundation is equally admiring of the way in which, under the leadership of His Majesty King Bhumibol Adulyadej, this inspirational centre in Bangkok can have such a profound effect on the health and well-being of so many people across the country. It is a truly special place and says much about His Majesty’s great compassion for his subjects.





A thriving forest in the midst of Bangkok

Demonstration forest

His Majesty also decided to introduce a demonstration forest at Chitralada Villa to study tree species after observing a large number of dipterocarp trees being felled for timber during the course of a visit to Klai Kangwol Palace. Aware of the need to preserve these giant trees because of their ecological importance to rainforests, the King planted dipterocarp seeds at Klai Kangwol Palace and later had the saplings transferred to Chitralada Villa. Other tree species from different parts of the country were planted along with the original saplings.

When Thailand celebrated HM the King's 84th birthday anniversary in 2011 this demonstration forest of over one 1,000 saplings marked 55 years as a thriving forest with its own localised climate that induces rainfall over Chitralada Villa.



Their Majesties and the Crown Prince nurturing dipterocarp seedlings transplanted at Chitralada Villa



Nil raised by His Majesty at Chitralada Villa to provide farmers with a high-quality, low-cost source of protein



Fish farming

Following a visit to Thailand in 1968 by Japan's Emperor Akihito (Crown Prince Akihito at the time) His Majesty found a way to address concerns that poor families – mainly farmers – were not able to enjoy high protein diets. During his stay in Thailand, Emperor Akihito presented the King with fifty fingerlings of *Tilapia nilotica* (River Nile fish) which His Majesty raised at Chitralada Villa and subsequently offered to farmers for breeding and consumption. Today Nil fish, the name given by the King, constitutes an important source of good-quality protein. Later on, the Department of Fisheries conducted studies aimed to improve the strain of Nil fish which, after its third phase of improvements, is now regarded as the “Chitralada strain”.



The late HM Queen Fabiola of Belgium was guided by HM the King during a tour of Chitralada Villa

Overseas visitors

From time to time, often due to economic concerns over, say, oil shortages or a fall in the price of sugar cane, the Royal Chitralada Projects team will respond by expanding the scope of its studies and demonstration sites.

The 1970s saw the introduction of an experimental rice mill, a windmill at the nil fish pond, and a rice-husk grinding plant. Concerned about future oil shortages and the prospect of the falling price of sugar cane, His Majesty initiated a self-financed study in 1985 to establish the cost of producing alcohol from sugar cane as an alternative energy source. The Royal Chitralada Projects team used alcohol obtained from agricultural products, or waste, to produce gasohol and diesohol by blending alcohol with gasoline or diesel oil respectively.





HRH Princess Maha Chakri Sirindhorn discussing milk products with Their Royal Highnesses Crown Prince Haakon and Crown Princess Mette-Marit of Norway, 2006

Subsequently, the high cost of producing diesohol for diesel engines inspired the team to research the production of biodiesel from vegetable oil or animal oil leftovers from commercial use.

Throughout the 1980s work continued with experimental, alternative fuel production schemes, fruit juice and dried fruit production, a drinking water plant, cheese plant and a plant for mushroom culture. In the 1990s a honey production plant was established along with a cannery for fruit juice, a sa paper (mulberry) factory, and a solar energy house and cold water production plant using heat generated from rice husks. Since 2001 further work has resulted in the establishment of the Suan Chitralada UHT plant, biodiesel production, a solar-powered water pumping station, and a wind-powered electricity generator.

Visitors to the Royal Chitralada Projects can obtain permission to tour the facilities which can take two to three hours for a cursory study of the entire complex.

In recent years, more than 70 different groups of visitors comprising some 1,300 people from all walks of life received permission to tour the facilities at Chitralada Villa. Visitors included law students, exchange students, graduates and even teachers from universities





HM King Mswati III of Swaziland visited the Royal Chitralada Projects, 2006

specialising in agriculture. But there were many overseas visitors made up of diplomats and other personnel from ministries and embassies concerned with agriculture, aquaculture, and forestry management in their own countries who were eager to learn from the work carried out at Chitralada Villa. In some cases, for example in the Kingdom of Lesotho and Lao PDR, similar study centres were set up in their own countries to conduct agricultural experiments along the lines of those carried out by the Royal Chitralada Projects team in Thailand.

Lessons learned from experimental work in the grounds of Chitralada Villa, from studies at six royal development study centres that were established in different locations in Thailand in the late 1970s and early 1980s, and from the many projects implemented by His Majesty and members of the royal family, today continue to play a leading role in bringing improvements to the daily lives of Thailand's less fortunate people.

In the cooperative spirit of sharing knowledge and exchanging information with friends around the world, the following Chapters in this publication offer a small sample of royal development projects and other activities that have played an important part in establishing the Kingdom of Thailand's Royal Family alongside others who champion humanitarian causes.



Each year, scores of international visitors visit the Royal Chitralada Projects



His Majesty the King with HRH Crown Prince Maha Vajiralongkorn



Royal Development Study Centres







His Majesty, often accompanied by HRH Princess Maha Chakri Sirindhorn, relied greatly on field trips to collect firsthand knowledge prior to initiating a new project

ROYAL DEVELOPMENT STUDY CENTRES

Throughout sixty years of his reign, His Majesty King Bhumibol Adulyadej (Rama IX) has dedicated much personal effort accumulating knowledge and committing personal resources to advance the well-being of the people of Thailand, in particular those living in isolated areas. His Majesty's aim, industriously applied over the years, has been to focus on helping people to help themselves to become self-supportive.

More than 4,000 royal development projects have been initiated in line with His Majesty's philosophy of self-sufficiency by addressing socioeconomic development and through the preservation of natural resources and environmental conservation. It is both poignant and significant that throughout the decades these projects have served to underpin the King's pledge given in the traditional Oath of Accession delivered at His Majesty's coronation on May 5, 1950: *"We shall reign with righteousness for the benefits and happiness of the Siamese people"*.

Royal initiatives support self-sufficiency

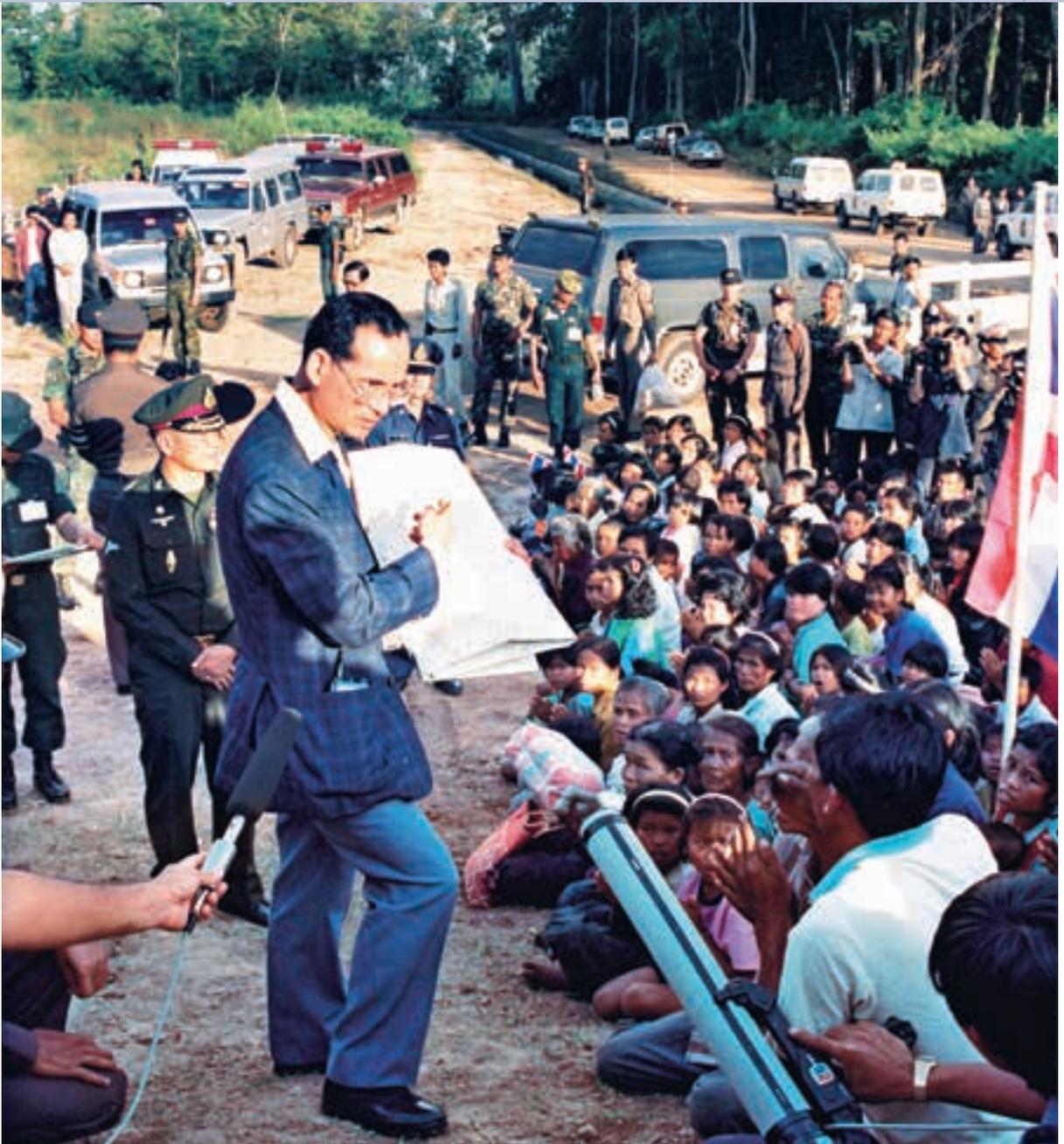
From the very start of His Majesty's reign, the King advocated a structured approach to collect and record detailed information from documented research, field studies, and during firsthand conversational exchanges with local people, community leaders and on-site government officials prior to turning any royal initiative into a development project. The King always went to great lengths to explain the likely impact on the livelihood of different groups of people before starting any project. This meant that work never began until the people involved were receptive and prepared to embrace change.

In a speech given by His Majesty on July 18, 1974 to graduates of Kasetsart University, an educational institute in Thailand that emphasises agricultural science, the King stressed that *"...Development of the nation must be carried out in stages, starting with the laying of the foundation by ensuring the majority of the people have their basic necessities through the use of economical means and equipment in accordance with theoretical principles. Once a reasonably firm foundation has been laid and in effect, higher levels of economic growth and development should next be promoted..."*





Working with interrelated government departments was part of His Majesty's step-by-step approach



The King listened to villagers and explained the likely impact of projects before they were started

Later that year, on the eve of His Majesty's birthday, the King addressed the nation from Dusidalai Throne Hall, Chitralada Villa, Bangkok and spoke of the importance of taking a step-by-step approach to development on the basis of self reliance. "...no matter what others say – whether they will accuse Thailand of being old-fashioned or obscurantist. So long as we have enough to live on and to live for – and this should be the wish and determination of all of us – without aiming for the apex of prosperity, we shall already be considered as the top in comparison with other countries in the present world..."



His Majesty's philosophy of a "sufficiency economy" follows a middle-path for co-existence in an increasingly globalised world

The concept of a sufficiency economy

Twenty-five years prior to Thailand experiencing a serious economic downturn in 1996-8 – a contagious episode that had global ramifications – His Majesty had urged Thai people to practise what the King later described as a “sufficiency economy”.

The philosophy of a “sufficiency economy”, His Majesty made clear in many speeches, is not aimed solely at the poor and needy. It advocates that families, communities and government officials follow a middle-path on how to live and behave in developing and administering the country in order to coexist in an increasingly globalised world. Sufficiency, in this case, means exercising moderation and reasonableness while developing an “immune system” to mitigate the impact of change, both internal and external.

Years later, at a ministerial conference on Alternative Development: Sufficiency Economy, held in Thailand in November 2004, the Office of the Royal Development Projects Board made reference to the royal speeches that advocated self-reliance, stating that “...by having enough to live and to eat, moderation, reasonableness and self-immunity...the king's royal statement significantly raised consciousness among Thai people to be prudent, to realise steps of development which are academically correct, and to adhere to morals for every conduct of life. All these are known as 'Sufficiency Economy'.”



Step-by-step approach

Adopting and pursuing a structured approach that was both simple and logical became the hallmark of His Majesty's work whenever a new project was initiated.

Tackling public health was His Majesty's first priority because medical services lagged behind public needs, especially in remote areas. A healthy body and mind, the King always maintained, were essential in making a difference to a person's life.

Subsequently, basic public works issues were addressed, principally in aid of the country's farmers who, at the time, constituted the majority of the population. Water sources were identified and developed for farming purposes and domestic consumption. Also, in the early days, paved roads had to be built to help farmers get their produce to markets.

Over the years, royal initiatives have been translated into a wide variety of projects ranging from, for example, the royal rainmaking project to the construction of reservoirs and dams. All royal development projects are conducted in a coordinated manner and in line with His Majesty's humanitarian concern for families and communities through the pursuit of socioeconomic development, the preservation of natural resources, and environmental conservation and protection.

In tandem with the development projects, the King urged government agencies to provide educational opportunities for people living in largely inaccessible rural areas. Meanwhile, His Majesty revived the tradition of awarding the King's Scholarship to allow greater access to higher education overseas for Thailand's brightest students. The King's Scholarship was initiated in 1897 by HM King Chulalongkorn (Rama V) to provide opportunities for students to acquire international skills and knowledge appropriate for the development of the Kingdom of Siam (later Thailand). It was one among many initiatives that spurred the country towards modernisation.

Royal development projects empower people to become self-supportive



Experiments in agriculture

As long ago as 1952 parts of the grounds of Chitralada Villa in Bangkok, the residential home of Their Majesties the King and Queen of Thailand, were turned into plots to study agriculture and aquaculture. Although small in scale, these experimental plots for growing rice, animal husbandry, and fish farming, served a vital purpose by demonstrating to individuals and communities how to approach farming as an occupation.

From repeated and extensive visits to rural parts of Thailand, His Majesty gained knowledge and built up a comprehensive understanding of the geographical profile and diversity of the land. Armed with this increased knowledge and expertise, the King pressed government agencies that held agriculture-related responsibilities to conduct more experiments on the land – particularly during farming’s pre- and post-harvest phases.

Experimental work embraced a wide-range of studies to assess various types of soil, identify appropriate types of plants for cultivation, determine produce quality and market demand, and introduce basic accounting and agribusiness skills to place farmers on a path to self-reliance.



Experimental plots at Chitralada Villa studied agriculture and aquaculture



His Majesty was aware that his approach to agricultural development had to be both practical and economical. For example, the King wanted to ensure that farmers made the most of what Mother Nature had to offer to achieve optimal and sustainable benefits. Other, similar initiatives geared towards managing natural resources were also introduced to encourage farming as an occupation among the majority of people.

As royal development projects grew in number, so too did the benefits. Growth also brought logistical problems: many of the projects were managed by different government departments whose personnel were obliged to travel extensively to keep up with the growing number of project sites being set up around the country. Also, travelling became a costly and time-consuming exercise for people visiting sites to consider their occupational options.

After a while, it became increasingly apparent that the experimental plots in the grounds of Chitralada Villa could not satisfactorily accommodate the growing number of agricultural-related questions arising from different soil conditions in different parts of Thailand. The country's geographical diversity ranges from temperate climates in hilly regions in the north; hot, dry plains that are desert-like in parts of the northeast, and swamplands in the south. To address these various aspects, the country required regional centres to conduct research and experimentation where issues or concerns arising from Thailand's geographical diversity could be addressed in situ. Subsequently, from the late 1970's to the early 1980's six royal development study centres were established in Thailand's four disparate regions: the North, Northeast, Central and South.

Each study centre set out to be a "model of success" where farmers could learn how to become self-supportive





Royal Development Study Centres

Central Region

Khao Hin Son RDSC, Phanom Sarakham District,
Chachoengsao Province
Huai Sai RDSC, Cha-am District,
Phetchaburi Province
Kung Krabaen Bay RDSC, Tha Mai District,
Chanthaburi Province

Northeastern Region

Phupan RDSC, Muang District,
Sakon Nakhon Province

Northern Region

Huai Hong Khrai RDSC,
Doi Saket District,
Chiang Mai Province

Southern Region

Pikun Thong RDSC, Muang District,
Narathiwat Province

Phupan RDSC, Muang District, Sakon Nakhon Province





Objectives of the Royal Development Study Centres

It was a fundamental part of His Majesty the King's vision that each of the royal development study centres (RDSCs) when established would become a "model of success" where farmers, and other members of the public who were interested, could learn, through example and guidance, how to become self-reliant in a sustainable way. To ensure conformity and continuity nationwide, each RDSC applied five fundamental criteria:

- Conducting studies, research and experiments to determine guidelines and development methods suited to the different land and climate conditions of each area or region. This is the prototype or, as the King called it, a "model of success" for people in other areas to follow;
- Facilitating an exchange of information among academics, development workers and the public by compiling successful outcomes from studies, research and experiments and integrating technical knowledge with practical theories. This creates a source of knowledge to pass on to the general public. Each centre is also a venue for officials to study and conduct work experiments and, simultaneously, promote an exchange of experience and understanding. It is also a focal point for drawing-up guidelines for problem-solving among the three groups most involved: academics, development promotion officials, and the public;
- Carrying out integrated development activities, serving as a model and good example of development work suited to different areas, by emphasising the optimum use of resources. The development strategy focuses on using as



Royal development study centres are one-stop service facilities

many fields of knowledge as possible because one field supports and complements the development of other fields. This represents a systematic integration of knowledge, operating techniques and management;

- Facilitating coordination within the government sector on project planning and management in various government agencies and departments to provide optimum benefits. Each RDSC stresses the importance of interdepartmental management within the civil service;
- Functioning as a one-stop service facility that gathers results of studies, experiments and demonstrations that have proven to be successful whether in the fields of agriculture, water resources, livestock, fisheries or social and occupational development presented in the form of a “living natural museum”. Interested parties can see everything in one place and, at their convenience, assimilate knowledge that will enable them to carry out development work to maximise benefits.





Study centre locations were normally chosen after inspection by the King

Locations and topographical features of the RDSCs

Following His Majesty's proposals, six RDSCs were formed from 1979 through to 1983. In practice, the implementation of royal development projects always take into account the topographical and sociological conditions relative to each local area, all of which differ in various aspects. In the course of serving as focal points for studies, research and agricultural experiments to establish development guidelines for each area, the RDSCs also take into account the occupations and lifestyle of local people.

Outlining the various sites chosen as Royal Development Study Centres, the Secretary General of the Chaipattana Foundation, and former Secretary General of the Office of the Royal Development Projects Board, Dr Sumet Tantivejikul said, "The local people wanted to give His Majesty a plot of land.

At that time they wanted the King to build a summer palace in the province hoping he would spend more time there."

Dr Sumet, who also serves as senior advisor to the Office of the Royal Development Project Board, said His Majesty inspected the land and found it to be sandy and barren and probably unsuitable for crop cultivation.





The small residence “Sam Chua Pavillion” of His Majesty the King in Khoa Hin Son RDSC, Chachoengsao Province, built in 1982

“His Majesty said he was grateful for the offer but to build a royal residence there would not be in the best interests of local people. The King asked the donor if he would mind if an agricultural study centre was created on the land instead”

Subsequently, His Majesty asked officials of Phanom Sarakham District and government agencies involved to use the land to establish an agricultural and vocational study centre which the King named Khoa Hin Son Royal Development Study Centre in 1980.

Dr Sumet said the King’s prime concern was not for himself but for the people, “...yet, in a way, the residents got their wish because the King already had a small residence in the area and, it wasn’t long before His Majesty made further visits to ask for more land to enlarge the study centre for the benefit of local people.”



Khao Hin Son, the first royal development study centre, was once plagued by serious deforestation

Khao Hin Son RDSC

Khao Hin Son Royal Development Study Centre, the first RDSC, was considered an appropriate location for a study centre because the area was once plagued with illegal logging that led to serious deforestation. The soil had deteriorated to such an extent that cassava was the only arable crop farmers could grow. Subsequent erosion of surface soil encouraged the centre to conduct development-related studies, gather research and carry out experiments to help restore the environmental balance of nature and encourage soil rehabilitation. Afterwards, suitable crops were identified for cultivation to improve the earning potential of farmers.

The centre's role has been to progressively disseminate knowledge concerning agricultural development; to serve as a centre for technology transfer on occupational development for farmers, and to act as a training centre for farmers concerning agricultural technology and handicraft skills. The training covers a wide spectrum of activities including land development, agricultural education, agricultural extension, forestry, livestock development, fisheries management, community development and cooperative promotion.





His Majesty's main concern was to ensure donated land was used to benefit the people

Over a period of time, development work carried out at Khao Hin Son brought forth a significant increase in crop productivity, which not only translated into improved financial returns for farmers, but also stimulated land prices. Land values increased such that farmers and villagers were less willing to sell their land, preferring instead to recognise its potential for improving their livelihood.



Khao Hin Son is a successful training centre teaching agricultural technology and handicraft skills



In an address given by His Majesty the King from Sam Chua Pavilion, Khao Hin Son, on April 23, 1997, commenting upon the improved livelihood of villagers and farmers, the King announced, *"...Many parties have been working together in close cooperation in the development of Khao Hin Son. Through this collective effort, consistently sustained over a period of fifteen years, the Khao Hin Son Royal Development Study Centre has become a practical demonstration model from which farmers are able to observe, learn and gain knowledge. Perseverance is an important quality. Through perseverance, results are achieved, which, in turn, leads to a better and more comfortable existence for the people. Nothing brings me greater peace and joy than to know that the people are leading better lives"*.



Huai Sai RDSC

The study centre is located in Thailand's lower central region in the district of Cha-am, Phetchaburi Province on the west coast of the Gulf of Thailand.

Sandy soil, resulting from inappropriate farming techniques and an overzealous use of pesticides in a once richly forested area, made soil rehabilitation an imperative. Over a period of forty years, the forest had become so seriously degraded that rainfall became unseasonal. Soil fertility declined upsetting the balance of nature and, in turn, denuding the ground of topsoil. Further damage was done by the repetitive cultivation of pineapples by the local populace; pineapple is a fruit that extracts many nutrients from the soil.



Demonstration site at Huai Sai RDSC showing how vetiver grass penetrated hardpan soil





Speaking in 1983 about the problems associated with Cha-am District, His Majesty the King concluded “...*This and the nearby areas used to be very fertile. There was plenty of water in the waterfall and water courses all year round. However, the degradation of forest causes the dry spells and unpredictable rainfall patterns. It can be predicted that the place may eventually become a desert*”.

The objective of Huai Sai RDSC, which was established in April 1983 and covers an area of approximately 2,500 hectares, was to act as the centre of development of forestry for multipurpose use. Farmers in the area were encouraged to participate in reforestation efforts and conservation. Wet fire-breaks were created and water sources developed to provide moisture to the area, which then became the subject of studies to determine the best approach for agricultural development. Farmers involved in the reforestation and agricultural processes have since enjoyed increased incomes and all-round benefits both from the forest and from various soil improvement activities.

This land, at one time described by His Majesty as “desert-like”, was transformed into an area rich in crops





The study centre works with government agencies to ensure a coordinated approach towards community development

Huai Sai RDSC carries out its work in tandem with government entities to ensure everyone proceeds in a coordinated manner to achieve maximum effectiveness in terms of water resources and soil development, forestry development, community development, quality of life and environmental development. Results are collated and disseminated to interested parties, including neighbouring countries in a spirit of cooperation. Today, communities in the area of the Huai Sai RDSC enjoy self-sufficiency.

A demonstration site set aside at Huai Sai provides a graphic illustration to farmers and other visitors of the beneficial effects of using vetiver grass – sometimes referred to as miracle grass – to penetrate hardpan soil as well as using it to encircle ponds and streams to conserve water. Visitors to the centre can inspect the basic hand drills and mallets used to crack the caked surface which resembles concrete. This is followed by drilling hardpan soil to a depth of ten centimetres or so and then packing the holes with compost and fertiliser to take the vetiver plants. The drilled holes are set some fifteen



centimetres apart and “fed” with piped water and air to oxygenate the subsoil. Over time, it has been possible to reconstitute the soil in the area and prevent it from returning to desert-like conditions. Strategically placed check dams ensure water is conserved for as long as possible giving more time to penetrate the soil and provide moisture for surrounding areas. After repeating the process for some years, hard and compacted soil in the Hua Sai area has been rehabilitated as forested land. Today, one section of reconstituted land at Huai Sai boasts a thriving herbal garden with fifty different varieties of herbs.



Rehabilitated soil and lakes in Huai Sai and surrounding areas has given farmers a future in agriculture, aquaculture and animal husbandry

Kung Krabaen Bay RDSC

Also in the central region of Thailand, Kung Krabaen Bay RDSC can be found in Tha Mai District of the eastern province of Chanthaburi.

During a visit to the province in December 1981 to dedicate the King Taksin Monument, His Majesty asked the provincial governor to “please consider locating a degraded forest in a national preserve to be the site of a development study centre, like that at Khao Hin Son, where coastal development can be studied.” The King decided that monetary gifts that people had donated to him during his visit should be used as part of the start-up fund for the centre.



Monetary gifts donated to His Majesty were used as a start-up fund for Kung Krabaen Bay RDSC in 1981





Regaining and maintaining an ecological balance led to higher productivity and a reconstitution of coastal fish stocks

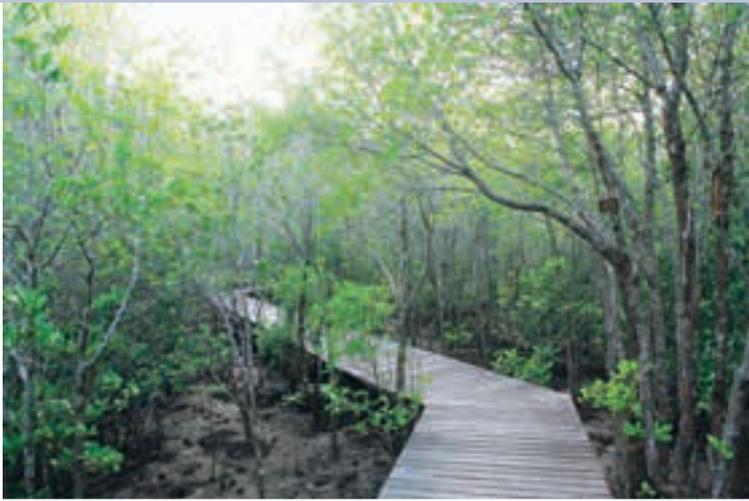
His Majesty initiated the centre in December 1981 after many visits to the area listening to and learning from local people about the problems they faced. Of major concern was the coastal strip that suffered from large-scale destruction of mangrove forests, a decline in coastal fish stocks, and saline water intrusion into agricultural land. Mangroves had suffered so much destruction it was difficult for local people to continue making a living in the fisheries industry.

The centre, whose focus inclines towards environmental conservation, made a study of the problem and explored the potential for rehabilitating and managing coastal resources. Demonstrations aimed at restoring coastal fishery were held in line with the introduction of integrated agriculture to maintain an ecological balance, higher productivity, and long-term self-development.



Destruction to coastal mangrove forests had resulted in depleted fish stocks





Phupan RDSC

The Phupan Royal Development Study Centre was established in November 1982 with the Royal Irrigation Department as the administrative body. The centre is in Thailand's northeastern region in the province of Sakon Nakhon, a farming area that suffered from substandard soil conditions.

The list of problems encountered there included insufficient sources of natural water; indiscriminate clearing of forested land for farming which, over time, destroyed the ecological balance of the area, and concerns about local people who lacked occupational know-how. This cluster of interlinked problems was addressed by Phupan RDSC, beginning by studying and developing suitable agricultural models for farmers to emulate. Forests were reconstituted through irrigation and then cash crops introduced to drive up farmers' incomes.

The region once suffered from substandard soil conditions caused by indiscriminate deforestation



Phupan RDSC helped restore the ecological balance of the area enabling farmers to cultivate cash crops





Today, integrated experiments give farmers the opportunity to increase their incomes from field crops other than rice by cultivating, for example, hybrid baby corn that can be grown concurrently with cassava. Also, silk worms can be raised in people's back gardens. Today, cottage industries and animal husbandry offer farmers more than just rice as a means of earning a living.





Cottage industries and animal husbandry offer farmers more than just rice as a means of earning a living

Huai Hong Khrai RDSC

Located in Thailand's northern region in Doi Saket District in Chiang Mai Province, Huai Hong Khrai RDSC was established in 1982 under His Majesty the King's initiative and driven largely as a result of droughts and forest fires caused by extensive forest poaching. The centre is in the Pa Khun Mae Kuang National Park, a mountainous and forested region heavily degraded in the central and southern portions where the study centre is located.

Studies at the centre encompass watershed development as an appropriate model with forested areas designated for planting three types of forest with four applications: economic crops, fruit trees, and firewood, plus the fourth application for soil conservation and watershed areas to engender moisture and create a natural equilibrium.

Huai Hong Khrai RDSC was established to combat drought and forest fires inspired by large scale forest poaching in the Pa Khun Mae Kuang National Park



Water supplies come from three sources: from hill irrigation systems, rainfall, and from water collected in small check dams built to preserve moisture in the area. Other studies have examined agro-forestry development, watershed sources, forest ecology, wet firebreaks, the breeding of wild animals in watershed source forests, soil development, conservation management, as well as studying different aspects of agricultural development. Further research examined livestock breeding, dairy cattle, poultry, and industrial agriculture.

The centre experimented with a phased development pattern to make farmers self-supportive without destroying their natural surroundings.

The study centre worked to make farmers self-supportive without destroying their natural surroundings





Since the 1980s Huai Hong Khrai RDSC has received a steady stream of high profile visitors including members of foreign royal families, presidents and prime ministers. As far back as 1987, HE Sir Ninian Stephen, the twentieth Governor-General of Australia paid a visit to the centre. Two years later, Sir Ninian became Australia's first Ambassador for the Environment.

Other visitors in the 1980s and 1990s included Britain's heir to the throne HRH the Prince of Wales, the King and Queen of Malaysia, Emperor Akihito of Japan and the prime ministers of Lao PDR, India and Cambodia.

Since the start of the new millennium, further visits have been made by the King of Buganda, King Letsie III of Lesotho, the President of Singapore, and the Crown Prince of Tonga who visited the centre in 2010.



Pikun Thong RDSC

In 1981 when Their Majesties the King and Queen and Their Royal Highnesses Princess Maha Chakri Sirindhorn and Princess Chulabhorn stayed at Daksin Palace in Narathiwat Province, they visited several localities where land was inundated with stagnant water. This was a year-round phenomenon affecting a little under 42,000 hectares of peatland that became acidic when drained making it unsuitable for cultivation.

His Majesty suggested to the provincial governor that there ought to be a development study centre in this southern province to study the problems associated with peat soil and make recommendations to benefit the local people. Consequently, Pikun Thong Royal Development Study Centre was established in January 1982 to find a means to render acidic peat soil suitable for cultivation.

Once inundated with stagnant water, this peatland became acidic when drained and unsuitable for cultivation; a problem addressed by Pikun Thong RDSC



The King had spoken on several occasions about *klaeng din* (in English, tricking or teasing the soil), an idea to flush out acidity through a repetitive programme of flooding, draining and drying of plots of soil over an extended period. “...Conduct experiments as to make the soil extremely acidic by draining the water out and letting it dry, and study the ways to improve acidic soil and bring the results of the study to help the people in Narathiwat who face the problem of acidic soil by setting up a two-year experimental project; the plant to be experimented on should be rice. As for the “aggravating the soil” project that I have been talking about for some years, it is quite effective here.”

Pikun Thong RDSC took charge of the “Klaeng Din” project and studied the naturally-occurring process of acidification caused by deeply-layered pyrite in peat swamps. As the soil dried, it released sulphuric acid that caused acidity in the soil. Subsequently, plots of soil were repeatedly and alternately dried and flooded to accelerate the reaction of pyrite to a point where the soil became too acidic for crops to be grown productively. The next step, based upon His Majesty’s initiative, was to reduce soil acidity which is a major engineering process. A guidebook on how to make use of acidic soil was produced later.



His Majesty advocated “klaeng din” (teasing the soil) to flush out acidity through repeated bouts of flooding, draining and drying and suggested planting rice to test the soil’s arability





Dr Sumet Tantivejkul said His Majesty's original idea in addressing this particular problem was to increase the acidity of the soil...make it worse...then find out how to make it better. "His Majesty compared it to the cleaning cycle of a washing machine which first agitates, then repeatedly cleans and flushes clothes with clean water..but in this case the cycle is repeated over a couple of years to deacidify soil to make it suitable for cultivation."

Specific projects undertaken at Pikun Thong RDSC have included developing acidic soils, using fresh water blended with lime dust to deacidify the soil, and testing the viability of fish culture in formerly acidic water that became brackish.

One aim was to rejuvenate the land to cultivate para rubber and palm oil into a fully-integrated cottage industry. Another innovation was to promote animal husbandry, especially with animals that could adapt to watery conditions such as poultry, goats, sheep and cattle. Success rested on management techniques: knowing what was possible within prevailing conditions and then managing to achieve that end. Concurrently, local people were encouraged to participate in conservation efforts to maintain a balanced ecological system to ensure lasting fertility which is essential for self-supportive farming.

The study centre aimed to rejuvenate the land to cultivate para rubber and palm oil into a fully-integrated cottage industry





All royal development projects follow His Majesty's philosophy advocating a Sufficiency Economy

Operating philosophy of the RDSCs

The royal development projects are based on His Majesty's Sufficiency Economy philosophy. Each of the six royal development study centres adheres to that principle in every step of their operation starting from an integrated management that brings together officials from interrelated government agencies to plan and work in a collective manner. The goal of each centre is to extend the benefits obtained from studies, research and experimentation for greater public use based initially on the concept of "sufficiency" and "moderation", while recognising an individual's abilities. As a result, cost-effectiveness is at the core of the management approach at all six RDSCs, which explains their compact size.

Additionally, His Majesty recommended using simple and appropriate technology among local farmers in conjunction with "local wisdom". Instead of adopting complicated, state-of-the-art technology, the King preferred they turn to natural resources or raw materials closer to home and practise "moderation" to make the most of the resources for long-term benefits. As an example, many soil erosion problems can be addressed, relatively easily, by using vetiver grass to conserve soil and water thereby supporting natural reforestation along with other basic approaches. This form of solution is long-term and constitutes a commonsense approach that contributes to the survival of families and communities with the minimum of help from imported technology – better still, by sidestepping it entirely.

Adopting a three-phase approach

Each of the six RDSCs employed a three-phase approach in conducting their respective operations.

The first phase, in the early days, was devoted to establishing vital infrastructure such as reservoirs, roads, electricity supplies and office buildings needed for the experiments in the second phase when efforts turned to studies and research by different teams of designated government officials who could coordinate well with one another. Farmers domiciled in the vicinity of centres were also employed during this second phase.

The third phase took place in 1987 built on results from the earlier phases. At this juncture, farmers were encouraged to put into daily practice the lessons learned after conducting successful studies and experiments at the aptly described “living natural museums”. After learning from the centres, farmers became “model farmers” or “models of success” for others to follow in different parts of the country as foreseen by the King.

Farmers visiting a centre are able to observe other activities including animal husbandry, fishery, water management, handicrafts and food-processing. In effect, centres functioned as a one-stop service facility. In addition to farmers, anyone with an interest could visit a centre, select a topic of interest, assimilate the associated knowledge, or know-how, and apply it according to their own livelihood, resources (land, capital and labour) and the geographical variances.



During visits to Royal Development Study Centres, His Majesty was often accompanied by HRH Princess Maha Chakri Sirindhorn



Learning new farming techniques

Not surprisingly perhaps, people living close to the centres were among the first to benefit because many were employed at centres during the early stages of development. As “hired” farmers, for example, they learnt how to redevelop, cultivate and maintain land – farming techniques they could readily apply in conducting their own agricultural activities. Inevitably, results from successful experiments filtered through to neighbouring villages (the RDSCs primary targets) along with support in ways that complemented individual social and cultural conditions.

While farmers took stock of the advice given by the centres’ personnel, who visited them regularly, they were also invited to make return visits to a centre. This gave personnel an opportunity to keep a check on progress and encourage farmers to enrol in a wider range of training courses including soil improvement, plant cultivation and propagation, dairy and poultry farming, integrated agriculture, the New Theory, fishery, organic plantations, handicrafts, herb processing techniques, mushroom farming, value-added processed vegetables, and forest conservation.



Personnel at the royal development study centres not only offered farmers training and advice but also encouraged them to keep abreast of agricultural developments



New Theory

His Majesty the King's New Theory advocates dividing a farmer's land in the ratio 30:30:30:10 such that thirty percent forms a reservoir to provide year-round water; thirty percent is set aside for agricultural land, probably paddy rice; thirty percent is used for field crops or fruit trees, and the remaining ten percent is for residential purposes, roads, dykes, drainage, as well as for family gardening and animal husbandry.

This was the first step covering smallholdings which allowed farmers to be self-sufficient while creating unity and fostering harmony within their communities. The second step was to encourage farmers to form cooperatives that extended to marketing their (surplus) products, and provide welfare, education and social activities with help from government departments and foundations. The third step broadened the scale of work so that communities were able to secure funding from banks to establish and operate a community mill; set up a cooperative store, source investment capital for expansion purposes and develop a better standard of living for families.

Training courses on His Majesty's New Theory assists farmers make the best use of their land through better management techniques





Regarded as “living natural museums” study centres have been visited by tens of thousands of people including farmers, student leaders and civil servants

Training courses at the centres, which ran for up to thirty days depending on course content for the chosen subject, were open to anyone expressing an interest. People, who joined training courses on the environment and learnt how to optimise the use of natural resources, found the training both educational and entertaining. Most importantly, they were able to learn how to become self-sufficient and live in harmony with nature which, in turn, led to sustainable development. As efforts in villages surrounding the centres began to bear fruit (literally), the villages became developmental role models that could be studied and emulated by farmers from more distant areas, in effect building upon the centres’ successful results.

As envisaged by His Majesty the King, the six royal development study centres were geographically representative of each region, but each had its own minute details with specific features requiring further study. Consequently, “centre branches” were established to study individual aspects whose outcomes could be adopted by farmers.

From the inception of the RDSCs, up to their evolvement as “living natural museums”, and through active promotion, visitors to the centres have grown in number with more than 100 delegations comprising some 100,000 people made up of farmers, community leaders, student leaders and civil servants (both at the operational and management levels) undertaking training courses, or merely making an annual visit to one or more of the centres.



Lao PDR's President, HE Mr Kaisone Phomvihhan took an interest in Thailand's RDSCs which led to the establishment of Huai Sonn and Huai Soie Agricultural Development and Service Centre in Vientiane

Domestic and international cooperation

Although most visitors to the centres are local people from different parts of Thailand, foreign visitors do figure prominently, in particular guests of Thailand's royal family. Some are national leaders, for example HE Mr Kaisone Phomvihhan, the president of Lao PDR, who sought and received royal approval from His Majesty the King to have similar initiatives established in his own country. This took place after numerous visits had been made to study centres in Thailand.

Cooperation led to the establishment in 1993 of Huai Sonn and Huai Soie Agricultural Development and Service Centre in Vientiane. The location was chosen because of the geographical similarities between northeastern Thailand and Vientiane. Akin to Phupan RDSC in Thailand's Sakon Nakhon Province, the Laotian centre offers agricultural demonstrations and services but does not conduct its own studies and research. The centre's demonstration and experimental plots include rice, fruit orchards, integrated agriculture, animal husbandry and fishery. The Vientiane Agricultural Development Centre made it possible for Laotians to observe and receive training relevant to their livelihood. Up till now, it has proved to be a huge success in the Lao People's Democratic Republic.



Sufficiency economy philosophy

Increasingly widely recognised, the Sufficiency Economy model attracted the attention of a number of countries that decided to adopt it for their own use. Indeed the Sufficiency Economy philosophy has proven to be effective particularly during demanding times such as 1996-8 when much of the world, including Thailand, was in the grip of a major economic crisis. The Sufficiency Economy model was widely adopted at the time not only by people in the agricultural sector but also by small, medium, and large corporations. To their surprise (and delight) agro-industrialists found they could adopt the Sufficiency Economy model in their private lives as well as using it for pilot projects before expanding on a larger scale.

By establishing the six royal development study centres in Thailand, His Majesty turned his Sufficiency Economy philosophy into something tangible. As a result, the centres welcome an endless influx of visitors from all walks of life. Many are world leaders, some are academics, others trainees attending courses at the Asian Institute of Technology (AIT), plus foreign dignitaries and students.

Typically, visitors receive an overview of the royal development projects and a lecture on His Majesty's approach to project development before proceeding to areas of specific interest. But it is always the royal development study centres that capture the interest of each delegation as study centre records testify.

His Majesty's vision of self-sufficiency has developed in a sustainable manner to preserve our resources and protect the limited environment



Overseas visitors to Thailand's RDSCs

Visitors to the Royal Development Study Centres have not been solely from neighbouring countries. They also came from friendly nations from around the world especially from Asia, Europe and Africa. Heads of State, such as the King of Sweden and the Queen of Spain, were included among the visitors.

A twenty-four-member delegation from Lao PDR, Cambodia, Vietnam, Myanmar, southern China (Yunnan Province) and Thailand made a study tour of Huai Hong Khrai RDSC in Thailand's northern province of Chiang Mai in 2005. Their main interest was in restoring watershed forests but the delegation also visited "model farmers" plots.

A year later, twenty-five government officials representing regions in Africa, South Asia and Southeast Asia took part in a three-day study tour of three RDSCs: Khao Hin Son in Chachoengsao Province, Kung Krabaen Bay and Huai Sai in Chanthaburi and Phetchaburi provinces respectively. Another group of twenty-five mid-level officials from international cooperation agencies in fourteen African countries and eleven Middle East countries followed up with a visit to Kung Krabaen Bay RDSC.

Royal development study centres drew a great deal of attention at the time celebrations took place for the sixtieth anniversary of His Majesty the King's accession to the throne in 2006. For example, after expressing interest in His Majesty's Sufficiency Economy philosophy, arrangements were made for Their Majesties King Letsié III and Queen Masenate Mohato Seeiso of the Kingdom of Lesotho to pay a visit to Huai Hong Khrai RDSC in Chiang Mai. The King of Lesotho was so impressed with the work of the centre he decided to have similar facilities set up in Lesotho, a landlocked enclave surrounded entirely by the Republic of South Africa.



HM King Letsié III of Lesotho and HM Queen Masenate Mohato Seeiso visited Huai Hong Khrai RDSC in Chiang Mai





Visitors from Lesotho undergoing training at Huai Hong Khrai RDSC

During this first visit, King Letsié sought to identify appropriate agricultural methods that Basotho farmers – and farmers across southern Africa – could adopt to improve their livelihood. Through the study centres, Thailand was able to render technical expertise as a starting point.

Later, Lesotho despatched a five-member delegation to Thailand to study the plantations and agricultural techniques at Huai Hong Khrai RDSC, the Wat Mongkol Chaipattana Royal Development Project in Sara Buri Province and the New Theory farming practice within the confines of the Chaipattana Foundation in Nakhon Nayok Province. The study tour also included a visit to the Royal Project in Chiang Mai Province.

The visit forged an initiative between the kingdoms of Lesotho and Thailand to promote technical cooperation in support of sustainable agricultural development resulting in yet another high-level delegation making a study tour of royal development projects in 2008.

Responding to Lesotho's enthusiasm, Thailand drew together teams of specialists from the centres to work with Basotho officials in Lesotho for short periods – and even on a continuous basis in some cases.

Meanwhile, five Basotho nationals undergoing training at Huai Hong Khrai RDSC made study tours of Wat Mongkol Chaipattana Royal Development Project and the New Theory farming practice at the Chaipattana Foundation in Nakhon Nayok Province. At the end of their study tours, they returned to Lesotho entrusted with the role of drawing up training plans for farming communities in their own country.



Specialists from Thailand trained Lesotho's officials



HRH Princess Maha Chakri Sirindhorn graciously escorted a Prince Mahidol Award delegation who were special guests at Pikun Thong RDSC in Narathiwat Province

Again, at the time of celebrations for the sixtieth anniversary of His Majesty's accession to the throne, Thailand's Ministry of Foreign Affairs played host to several countries by organising study tours to sites providing lectures and demonstrating Sufficiency Economy projects.

More visits took place in 2006 comprising delegations from Asia, Africa and Latin America making study tours to Huai Hong Khrai RDSC in Chiang Mai Province and Kung Krabaen Bay RDSC in Chanthaburi Province.

In the years following the celebrations for the sixtieth anniversary of His Majesty's accession to the throne, visits to royal development study centres steadily increased.

As executive chairperson of the Chaipattana Foundation, HRH Princess Maha Chakri Sirindhorn pays regular visits to study centres, on some occasions escorting visitors. Delegations from the International Award Committee of the Prince Mahidol Award Foundation under Royal Patronage were guided by Her Royal Highness on a study tour of Phupan RDSC as well as the Royal Sufficiency Economy Learning Centre, Huai Pu reservoir, and the Royal Nong Mak Thao Model Dairy Farm in Sakon Nakhon Province. That visit, in 2008, followed a previous visit by the same group a year before to Huai Sai RDSC in Phetchaburi Province.



During the time delegates from Cambodia, Lao PDR, Vietnam, China, Thailand and Myanmar were in Thailand for the 5th GMS (Greater Mekong Sub-region) Forum discussing “Promotion of the Sufficiency Economy Philosophy and the Integrated Use of Land”, a study tour of Phupan RDSC in Sakon Nakhon Province was arranged under the auspices of the Buakaew Roundtable International Project.

On this occasion, the delegates were from South Asia, Africa, Latin America, the Middle East and Western Europe. Next stop on their agenda was a study tour of soil-related improvement initiatives including techniques for using vetiver grass, soil improvement for cultivation purposes, and the mixed agricultural plots at Huai Sai RDSC in Phetchaburi Province. Delegates were able to learn the principles of Sufficiency Economy firsthand as they toured and viewed agricultural plots managed by farmers in areas surrounding the centre. Of particular interest was the integrated farming approach that optimises soil resources with an effective water management system for agricultural use.

On another occasion, government officials from member-countries of the Association of Southeast Asian Nations (ASEAN), including Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore and Thailand, participated in another study tour organised under the auspices of the Buakaew Roundtable International Project. After attending a lecture and receiving an overview of royal development projects, the delegation visited Huai Sai RDSC in Phetchaburi Province. They were able to observe the farmers in New Theory-based farms in the areas surrounding the centre and, in particular, to study pesticide-free farming techniques. At the end of the study tour delegates spoke positively about the Sufficiency Economy approach, confident they would be able to apply the principles in their own countries.



Visitors from Asia, Africa and South America observed New Theory-based farms close to Huai Sai RDSC in Phetchaburi Province

A few days prior to the 15th Annual ASEAN Summit that was held in Thailand in 2009, Thailand's consul-general to Hong Kong led a large delegation of foreign consuls-general and honorary consuls-general, along with their spouses, government and media representatives from Hong Kong and Macao, to Kung Krabaen Bay RDSC in Chanthaburi Province. There they discovered how a community had prospered by following a sustainable and environmentally friendly lifestyle.

During the time when a party of twenty Bhutanese nationals were in Thailand attending a training course on "Sustainable Land Management" the Office of Extension and Training at Kasetsart University took the group to Huai Sai RDSC in Phetchaburi Province following a lecture at the Office of the Royal Development Project Board giving an overview of His Majesty's projects.

The same centre was visited by students from the Asian Institute of Technology (AIT) to be briefed on the causes of hardpan (compacted soil) and rehabilitation methods required to transform it into arable land. They also reviewed incentives given to farmers to persuade them to turn from cultivating pineapples exclusively and take up integrated farming. The students reviewed successful results achieved by farmers by adopting the New Theory approach to farming.

The New Theory approach to farming was also scrutinised by a delegation of seventeen envoys from South Asia, the Middle East, Africa and Latin America during a study tour of Khao Hin Son RDSC in Chachoengsao Province. Among other things they were able to observe the New Theory-based mushroom farming, vetiver grass-growing techniques and the cultivation of herbal gardens.



Overseas visitors observing mushroom farming, vetiver grass-growing techniques and herbal gardens at Khao Hin Son RDSC in Chachoengsao Province



The Savannakhet Agricultural Service and Development Centre

The Savannakhet Agricultural Service and Development Centre in Kaisone Phomvihan province came into being following a written request for assistance from Lao PDR to HRH Princess Maha Chakri Sirindhorn. In his letter to the princess, Tonglun Sisulit, Lao's Deputy PM and foreign minister requested an agricultural cooperation project similar to the royally initiated Huai Son-Huai Sua Agricultural Development and Service Centre in Vientiane. Her Royal Highness graciously consented to the project and this development centre now serves as a venue for demonstrating agricultural activities and transferring technology to Lao farmers.

Princess Maha Chakri Sirindhorn consented to preside over the foundation stone-laying ceremony on March 13, 2012, revisited Lao PDR on April 29, 2014 to officially declare open the Savannakhet Agricultural Service and Development Centre.





Problems affecting soil conditions are similar in all parts of the world which is why His Majesty has always responded to overseas requests for assistance

Requests for assistance

Through the royal development study centres and also through the Chaipattana Foundation, of which the King is honorary president and HRH Princess Maha Chakri Sirindhorn executive chairperson, many requests for assistance are received from around the world. Dr Sumet explained that some requests come through Thailand's Ministry of Foreign Affairs, from as far away as Africa and even from neighbouring countries. "In the case of Lao PDR, for example, the Laotian president wrote a letter directly to His Majesty asking for assistance. To us, it doesn't matter where the requests originate...we try to help. The principle (of the problem) is the same and that's why we are happy to share knowledge and experience."

Where humanitarian aid and international cooperation are concerned, Dr Sumet insists that everyone, whatever their location, faces the same problems when talking about soil conditions – therefore the solutions are the same or similar. Whenever a letter is received requesting help, Dr Sumet said a study centre or the Chaipattana Foundation prepares Thai staff to work with the foreign country concerned to offer technical advice and also train local people.





Although the expression “Sufficiency Economy” came at the time when Thailand’s “bubble economy” burst in the mid 1990’s, Dr Sumet said His Majesty had coined the expression long before.

“His Majesty spoke of self-sufficiency at the beginning of his reign but it wasn’t declared as such. As everyone must know by now, the King of Thailand is, first and foremost, a practitioner of humanitarianism and is well aware that you cannot separate humanitarian issues from other aspects of life.”

According to Dr Sumet, all of the projects that stemmed from His Majesty’s initiative form part of an evolutionary chain that started at the beginning of the king’s reign and prevail to the present day.

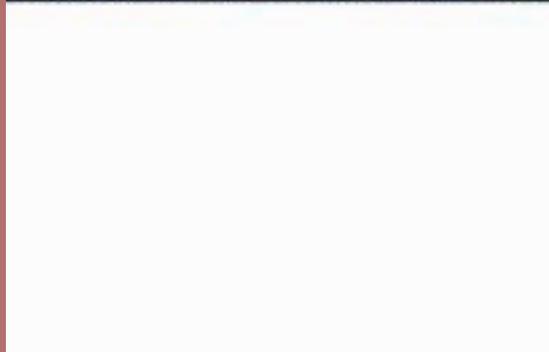
“It is also clear that His Majesty’s intention through the many projects he has initiated is to preserve our fragile resources...to live and develop in a sustainable way. Of course His Majesty’s concept does not relate solely to Thailand, it applies to the entire world.”

On the path to self-sufficiency





Vetiver, a Miracle Grass





NATURE'S DEFENSIVE BARRIER

Initially held in disdain by farmers, and often dismissed as nothing but a weed – until His Majesty the King of Thailand sensed its agricultural potential – vetiver grass (*Chrysopogon zizanioides* (L.) Roberty) at one time enjoyed a long life of relative anonymity. However, after the King became aware of its natural properties and studied its agricultural relevance, vetiver was, and still is, referred to as “miracle grass”.

A perennial plant, native to India commonly called Vetiver grass with the old scientific name *Vetivera zizanioides* (L.) Nash, its contemporary name was assigned by American taxonomist George Valentine Nash of The New York Botanical Garden: Vetiver is a Tamil word meaning a “root that is dug up”; *zizanioides* means “by the riverside,” which is where vetiver is most commonly found.

Over the years His Majesty King Bhumibol studied soil property and soil rehabilitation. Thailand's monarch was acutely aware of the problems associated with soil resource deterioration and initiated studies to find a solution. Naturally curious as to how local resources could be applied to solve problems (always keeping in mind that Thailand's farmers were too poor to afford “imported” solutions) His Majesty resolved to find out more about vetiver grass.

His Majesty the King and HRH Princess Maha Chakri Sirindhorn inspect a hedge of vetiver grass





His Majesty the King demonstrated how vetiver is planted at Huai Hong Khrai Royal Development Study Centre, 1995



After a great deal of study, the King came to the conclusion that vetiver grass was strategically important in the plant world and could be put to good use in Thailand. His Majesty proposed that local scientists should combine with government agencies to conduct research into whether vetiver grass could be used for soil and water conservation.

After extensive research, the plant was found to be extremely hardy; its brownish-purple flowers growing in dense, protective culms. The extraordinarily long roots of vetiver grow almost exclusively downwards two-to-three metres into the soil – establishing a strong foundation underground. The narrow leaves grow straight and stand erect, reaching up to seventy-five centimetres. Together, roots and leaves form a defensive barrier below and above ground. It seemed vetiver could play a defensive role in Thailand’s battle for soil and water conservation. Expressed in military jargon, the plants could well be soldiers in the King’s army for national development.

“Use nature to protect the nation!” was how Prof Dr Santhad Rojanasoonthon, director of research of the Royal Project Foundation and Chairman of the Royal Institute explained His Majesty’s concept. Thailand’s farming community was about to learn more of the strategic, agricultural value of this “root found by the riverside” as an effective hedge against soil erosion.

*Vetiver from a variety of localities demonstrated at Huai Sai Royal Development Study Centre ,
Cha-am District, Phetchaburi Province*





Vetiver planted alongside a canal helps prevent soil erosion

Properties of vetiver

The royal-initiated research programme discovered that vetiver could be grown in long rows, in effect forming a living barrier capable of resisting silts, retarding runoff, and allowing the soil to absorb water slowly adding humidity to the subsoil.

Vetiver grass can be used for preserving and conserving natural resources, for example along the banks of irrigation canals, reservoirs or ponds, and along road shoulders and the approaches to bridges. The plant's roots mature into tightly-knit nets that hold the soil together, effectively forming an underground "wall" to retard water flow allowing it to seep into the soil. The root system helps prevent gully erosion and vetiver hedgerows can stop erosion at the bottom of hills where earth embankments prove inadequate.



These vetiver roots reach to depths of three metres: Doi Tung, Chiang Rai Province



Klai Kangwol Palace, Hua Hin, 2009

Early research

Research work identified indigenous ecotypes: subgroups with species named after districts or provinces where they are found such as Mae Hong Son, Mae La Noi, Pang Mapha. There were also some imported varieties like Phra Ratchatan, which can be translated as “the gift of His Majesty the King”.

His Majesty was quick to act, and began by outlining to a group of experts in 1991 an appropriate course to follow. The King requested the royal development study centres, and other locations familiar with local topography, to conduct studies and carry out experimentation on vetiver grasses. Study centres were established around the country in the Eighties to act as live demonstration locations for local people to learn agricultural innovations and techniques.

His Majesty attended some of the centres and personally instructed several people. In 1991, the King also encouraged the director of one centre to plant vetiver culms around the edges of gullies and in cashew nut plantations on sloping land. It was important, His Majesty had instructed, to take photographic evidence “before” and “after” to prove the effectiveness of vetiver. Later, in 1992, during a visit to another centre, His Majesty suggested trials should be conducted on different strains of vetiver so that they could be used in extension programmes.





Vetiver grass used to fix soil erosion on newly-cut slopes at the Queen Sirikit Botanic Garden, Chiang Mai Province. Above in 1997; below in 1998



Recalling the earlier days of research that began in June 1991, Thailand's Dr Weerachai Nanakorn, an expert in vetiver cultivation, explained that His Majesty was not the only member of the royal family with an interest in the beneficial effects of vetiver. Her Royal Highness, the late Princess Mother, whose own sustainable development project was located in Doi Tung in northern Thailand's Chiang Rai province, also expressed a keen interest in the King's initiative. "At Doi Tung, the Princess Mother began to teach and conduct experiments on vetiver grass cultivation," Dr Weerachai said. "Eventually, the first million saplings of vetiver were provided at Doi Tung."



Their Majesties the King and Queen and HRH the Princess Mother inspecting vetiver roots



The first million bags of vetiver were provided at Doi Tung, Chiang Rai Province



*HRH the Princess Mother planting
vetiver grass*

Administering the Royal Initiative

To comply with His Majesty's 1991 initiative a committee was set up to provide administrative support. It was known as the Committee on the Development and Promotion of the Utilisation of Vetiver, or, CODPUV, and placed under the direct management of the Office of the Royal Development Projects Board in 1992. To understand the workings of this committee it is necessary to understand the purpose of the royal initiative: His Majesty's main objective in cultivating vetiver grass was to conserve soil (and thereby water) particularly on steep slopes such as in the hills of northern Thailand where the King had many projects in progress from the 1970s.

HRH Princess Chulabhorn in a field of vetiver at the Queen Sirikit Botanic Garden, Chiang Mai Province





His Majesty the King planting vetiver grass saplings

Hedgerows of vetiver

In his usual disciplined manner His Majesty kept track of results, periodically guiding those implementing the royally-initiated project. Although self-educated on the uses of vetiver, His Majesty's research material was thorough enough to be able to instruct others in a precise and clear manner. In conversation in 1993 with Dr Sumet Tantivejkul, a leading member of His Majesty's projects, principally the Chaipattana Foundation, the King suggested planting seedlings no more than fifteen centimetres apart. His Majesty explained that if the spacing between plants could be reduced to two-to-three centimetres the gaps along the narrow hedgerows could be filled more quickly.

The cultivation of vetiver hedgerows was a strong recommendation on His Majesty's part because hedgerows can effectively retard runoff along natural watercourses and steep-sloping areas. Vetiver hedgerows are capable of retarding and preserving large quantities of water that runs through them and prevent topsoil from being washed away. As the soil becomes more fertile, crops and plants are able to flourish.



Studying root properties of various ecotypes of vetiver at Huai Sai Royal Development Study Centre

Vetiver is adaptable

An important discovery on the part of His Majesty the King's research initiative was that vetiver grass can be found growing everywhere in Thailand; from the highlands to the lowlands and in a variety of soil conditions. It is found in inundated areas such as basins, natural waterways and swamps. Cultivation experts discovered that some ecotypes of vetiver can be grown almost anywhere and under adverse conditions. In Thailand it grows near sea level and on mountains at altitudes as high as one thousand metres. It can even grow in many, critical soil conditions. Kasetsart University at one time investigated the recovery of salty soil in eastern parts of Thailand using vetiver to build up the quality of the soil.

A field of vetiver grass in its natural habitat, Phayao Province, 2010



Vetiver being tested for salt tolerance in northeastern Thailand



Vetiver used to prevent soil erosion on newly-developed slopes at the Queen Sirikit Botanic Garden, Chiang Mai Province. Left in 1997; right in 1998



Tackling soil erosion

His Majesty the King was the first in Thailand to recognise the potential of vetiver as a practical, economical and efficient management and conservation tool to tackle soil erosion. In simple terms, soil erosion means soil that has been swept away. What is left is a nutrient-deficient subsoil, unable to support agriculture so the land becomes barren. At one time that was the King's principal concern. Today, this appears to be a distant problem; but for Thailand, at the time, it was a significant step forward. In 1991 the majority of people were rural villagers and they were wholly dependent upon the land to sustain their livelihoods.

In the future, soil erosion could become an even greater issue as population growth expands and land resources become scarcer. More erosion means more land loss. It means reduced soil fertility, greater rainfall runoff, and lower groundwater recharge. It also means more sediment flowing into rivers, more contaminants in water, lower quality drinking water, increased flooding along with fewer economic benefits but increased hardships to both rural and urban populations.

The importance of vetiver in this scenario cannot be overstated. The binding abilities and tensile strength of vetiver grass roots means the physical elements of soil can be maintained. Once planted on slopes it acts like an underground wall reducing erosion by up to ninety percent. It reduces and conserves rainfall runoff by as much as seventy percent; improves groundwater recharge, removes pollutants from water and reduces the risk of flooding, altogether vastly improving the economic benefits of communities.



Hilltribe villagers in Mae Sa Mai village, Chiang Mai Province, planted vetiver hedgerows to secure steep hillsides from soil erosion





Protector of fruit trees

“The King said we must grow other things along with vetiver to provide an income,” recollected Dr Santhad Rojanasoonthon, chairman of the research section of the Royal Project Foundation. His Majesty’s remarks were made in connection with the use of vetiver at the Royal Project’s activities in the hills of Chiang Mai province.

Also, in conversation in 1996 with Dr Sumet Tantivejkul, the King specifically mentioned that the use of vetiver to conserve soil moisture could be problematical. His Majesty was referring to the use of vetiver grasses in strips encircling fruit trees and other perennial crops, cautioning that the root system of vetiver grass is so extensive it could absorb nutrients from the trees thereby stunting growth. To overcome this, His Majesty suggested making a semicircular hedgerow at the down-side of the trees. In this way, the King noted, vetiver would perform its function of effectively conserving soil moisture for the trees. Later, in 1997, His Majesty explained to an interested audience of experts that in order to trap moisture a semicircle of vetiver should be planted to protect the trees.



Dealing with “hardpan”

In addition to sprouting new shoots, vetiver roots also expand to penetrate the ground vertically, and bind the soil together. In some agricultural areas, however, soil can be impenetrable, more like concrete. In such conditions, farmers are unable to till land surfaces without sturdy machines capable of breaking the hardened topsoil.

His Majesty was able to solve the problem of hard soil, or “hardpan” as it is known in agricultural communities, without using expensive machinery. The King was aware that the roots of vetiver were long and extended vertically, reaching great depths. One specimen at the Doi Tung Development Project in Chiang Rai province reached a depth of 5.2 metres – a world record for vetiver roots.

In discussing the hardpan problem with Dr Sumet in 1996 His Majesty instructed that deep holes should be drilled down into the ground as far as the lateritic soil level (stone-like subsoil) as an experiment. Always conscious of the inability of poor farmers to invest in such a project, His Majesty specified the drills should be hand-operated. The plan was to drill down and fill the holes with compost followed by vetiver. Planting vetiver in this way, the King explained, would trap moisture to break the soil and make the ground arable again.



After just nine months the roots of this vetiver plant in Doi Tung, Chiang Rai Province, had reached over five metres



In the course of a speech given on the occasion of His Majesty's birthday in 1997, the King described the dramatic effect that vetiver had on hardpan in an area of Cha-am in Phetchaburi province, central Thailand. His Majesty said it was like walking on a hard surface like stone, because years of erosion had removed the top soil. The King explained that vetiver grass was able to "explode" the hardpan bringing about an increase in arable land for farming after just one or two years.

Public and private participation

It was not long before the King's initiative reached the ears of business executives in public and private entities in Thailand. Many companies found a use for vetiver in their organizations. For example, PTT plc, Thailand's energy giant, found that vetiver helped considerably in ground reparation work and in beautifying disturbed land areas along its gas pipelines. Also, vetiver used along the Yadana Gas Pipeline Project, in Thong Pha Phum district of Thailand's Kanchanaburi Province, played a significant role in erosion control and slope stabilisation. Moreover, vetiver cultivation helped to prevent landslips and subsidence alongside the Thong Pha Phum-Ban E-Tong road at more than fifty known landslip points.



Schoolchildren carry vetiver seedlings to plant at their school.



Economic uses of vetiver

Despite His Majesty's efforts, many observers were surprised that some farmers remained reluctant to accept that vetiver had any "added value": In their estimation, cultivation of the plant in agricultural areas did not appear to produce tangible benefits in terms of increased revenue. That view was dispelled after research initiated by the King discovered that vetiver leaves and roots both had multipurpose uses that could yield financial benefits to farmers.

It was found that the vetiver species *Chrysopogon zizanioides* (L.) Roberty, with ecotypes classified as Sri Lanka, Kamphaeng Phet 2, Surat Thani and Songkhla 3, has long, waxy leaves that become soft and pliable when wet, suitable for producing high quality handicrafts. Conversely, well-dried leaves can be fashioned into wreaths, artificial flowers or for woven products like ropes, mats, hats, or baskets. The roots of vetiver can be fashioned into screens, blinds, fans and handbags.

For many years, Her Majesty Queen Sirikit promoted handicrafts as a supplementary occupation for farmers. Handicrafts made from vetiver grass were produced in the 1990s and, up to the present time, it is still possible to attend handicraft training courses in vetiver uses at very low cost.



Vetiver grass handcrafted into high quality, low cost articles



Beautification of urban areas

Vetiver has other properties besides being useful for fashioning handicrafts. This simple grass can help in landscaping modern, urban areas bringing about aesthetic and environmental improvements. Unsightly building sites, even established gardens, can be improved visually with perennial green vetiver grasses; attractive, ornamental plants that can be grown in the ground or in pots. Apart from landscaping, vetiver is used to delineate borders on paths and roads, and to beautify the edges of lakes and streams. When used in landscaping, vetiver facilitates slope stabilization, aids erosion control and helps in decontaminating toxic materials leading to improved habitat and pest control. From a maintenance point of view, these many virtues help reduce cost while beautifying roadsides and central dividers. Another important fact is that vetiver grass stays green when less robust plants wither and die.



Vetiver grass can bring aesthetic and environmental improvements



Pollution control

Apart from its uses in agriculture, handicraft products, and for beautifying land areas, vetiver is a welcome ally in the fight against pollution. Closely following the initiative of His Majesty the King, researchers found that vetiver grass can tolerate high levels of nitrates, phosphates, heavy metals and agricultural chemicals that can be toxic at high levels. Experiments are underway to see if the filtering effects of vetiver could help wastewater treatment or the rehabilitation of mine tailings, or for stabilising landfills and ordinary rubbish dumps.



Vetiver used to stabilise the slopes of landfill rubbish dumps. Guangzhou, PRC, 2003



HRH Princess Maha Chakri Sirindhorn observes an experiment to trap heavy metals using vetiver grass during wastewater treatment. Guangzhou, PRC, 2003

Scientific recognition and international contributions

The impact of His Majesty's vetiver initiative attracted the interest of scientists and agriculturists from around the world. Increased demand to learn more stimulated the public and private sectors to stage a forum at which results from the project could be examined by an international group of experts and information gained by His Majesty's researches disseminated globally.

Thailand hosted two international conferences on vetiver grass: The first conference (IVC1), in February 1996, entitled "Vetiver: A Miracle Grass", was held at Doi Tung Development Project in Chiang Rai, utilising huge field exhibition plots. Co-organised by the Chaipattana Foundation and the Princess Mother's Mae Fah Luang Foundation, with the collaboration of the World Bank and the FAO, the conference is still recalled today as a great success and the first step in introducing to the international community the results His Majesty had achieved through research and experimentation.





The Second International Vetiver Conference (IVC2) under the theme “Vetiver and the Environment” was first planned to be held in Latin America but was moved to Thailand in January 2000, coinciding with His Majesty the King’s 70th birthday. Her Royal Highness Princess Maha Chakri Sirindhorn presided over the opening ceremonies and attended the lectures. Pursuing His Majesty’s initiative, Princess Sirindhorn in 2000 became patron of The Vetiver Network International (TVNI). A keen conservationist, Her Royal Highness is deeply committed to the research and development of the Vetiver System (VS) in Thailand and elsewhere in the world.

Both conferences served as global forums to discuss His Majesty the King’s work concerning vetiver grass. Thirty countries were represented, namely, Australia, Bangladesh, Cameroon, Costa Rica, Denmark, El Salvador, Ethiopia, Fiji Islands, India, Indonesia, Kenya, Madagascar, Malawi, Malaysia, Nepal, the Netherlands, New Zealand, Papua New Guinea, the Philippines, Portugal, China, South Africa, Sri Lanka, Taiwan, Uganda, USA, Venezuela, Vietnam, Zimbabwe and Thailand. There were 400 participants overall.

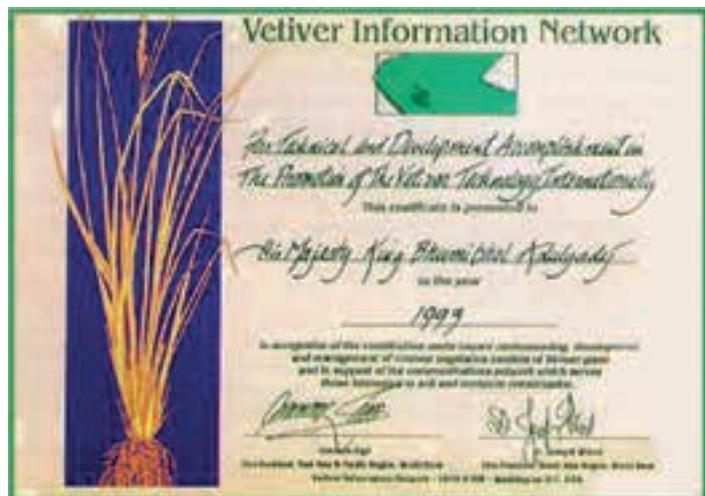


*Vetiver handicrafts
on sale in Caracas,
Venezuela*



HRH Princess Maha Chakri Sirindhorn attended the fourth ICV4 conference in Caracas, Venezuela in 2006

After the second conference, Madagascar requested cooperation from Thailand's Office of the Royal Development Projects Board to send Thai experts to give advice on cultivation of vetiver to restore the Fianarantsoa Côte Est (FCE) railway line damaged by two cyclones. The success of the royal-initiated vetiver project induced Thailand to set-up vetiver training and field trips for nationals from fifteen countries around the world. A special interest in vetiver operations was also registered by the Ministry of Environment and Natural Resources of the Philippines, Zambia's Ministry of Agriculture, Food and Fisheries, and the United States Department of Agriculture.



HRH Princess Maha Chakri Sirindhorn chaired the seminar on Latin America Vetiver held in Chile in October 2010

Two more conferences have since been held, both of them outside of Thailand. The third conference (ICV3) took place in Guangzhou, China, in 2003 under the theme “Vetiver and Water”, which was also attended by TVNI patron HRH Princess Maha Chakri Sirindhorn. The fourth conference (ICV4) “Vetiver and People” was held in Caracas, Venezuela in 2006. Previously, Venezuela had sent officials to Thailand to observe and train in the use of vetiver. Upon their return to Caracas, they discussed their observations with a private sector company producing drinking water. They found their experiences so useful that Venezuela volunteered to host the fourth conference (ICV4) to learn more about vetiver and its potential uses for solving soil erosion and enhancing water retention in coastal and mountain areas of Venezuela.

The ICV5 was held at Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, India in October 2011. It was under the theme “Vetiver and Climate Change” to cope with the crisis and disaster caused by climate changes. There were 180 participants from 16 countries who attended the conference.

The ICV6 will be held at Da Nang, Vietnam in May 2015, under the theme Vetiver System : Empowering Sustainable Development.

Participants planting vetiver to stabilize steep slopes, Caracas, Venezuela.





Vetiver used to stabilise slopes near Caracas, Venezuela

International implementation

Sharing vital information about vetiver with the international community became possible thanks to research conducted under the King's guidance and advice. The international conferences recognised the Vetiver System (VS) as a tool for soil and water conservation and many countries adopted its use in a variety of ways.

In the Central America country of El Salvador, for example, vetiver was used alongside roads to give protection from the impact of Hurricane Mitch in 1998. In Madagascar, vetiver helped protect a key railway line from damage from annual cyclones that in previous years had shut down the railway for months on end. In Vietnam vetiver helped protect sea dykes from the worst effects of typhoons, and to stabilize highways in China, Malaysia and Vietnam.

China's government went a step further in demonstrating that the work championed by His Majesty the King in Thailand worked well in the People's Republic of China. Vetiver has arrested erosion at landfills and helped beautify highways in places like Guangzhou Province in southern China. Similarly, Nanchang City, the capital of Jiangxi Province in south-eastern China, introduced vetiver in 1998 to stabilize sand dunes affected by desertification. Vetiver was planted in hedgerows and though the sands lacked plant nutrients, over ninety percent of planted vetiver survived and flourished. Vetiver even stimulated other plants to grow with the result that sandy dunes were again covered with vegetation. Dr Weerachai Nanakorn noted that China considered the best type of vetiver for their use to be the type introduced by Thai researchers.



Vetiver improves the landscape alongside highways, Guangzhou, PRC

In Bangladesh, a tropical riverine country in South Asia, the World Bank took the royal initiative even further by using vetiver to fix soil erosion. A similar project was implemented in Myanmar by the UN Food and Agriculture Organization (FAO).

On the African continent, in Zimbabwe, vetiver is used extensively on large sugarcane estates, similar to those in South Africa. Vetiver has played a crucial role in stabilising farm roads, in controlling erosion in sugarcane fields and, in particular, in drainage ditches and irrigation channels. In the Kingdom of Morocco, vetiver is used to encircle banana plantations along the coast as a windbreak to protect them from strong Atlantic winds.

South Africa introduced vetiver to protect a number of crops including beans, bananas and chillies, but the two crops that benefited most from vetiver use were coffee and sugarcane. At the Sarabica Coffee Estate, vetiver hedges planted between rows of coffee trees have replaced contour banks as standard soil conservation measures. The hedges have reduced maintenance costs, facilitated traffic, and provided mulch for weed control in addition to aiding soil and water conservation.

In Australia, vetiver were employed in phytoremediation process to absorb dissolved heavy metals from industry polluted water, the result tolerates cadmium (cd), nikel (Ni), lead (Pb), mercury (Hg), zinc (Zn), etc. at a certain level.

The South American country of Venezuela sent ten women to Thailand to learn how to make handicrafts from vetiver. After returning to their home country they spread the word: vetiver is now used as a raw material for fashioning handicrafts. In Indonesia and Mali some handicrafts made from vetiver roots are marketed internationally.





Schoolchildren planting vetiver grass on steep slopes at Queen Sirikit Botanic Garden, Chiang Mai Province



King of Thailand Vetiver Award

His Majesty the King was well aware that apart from studies into vetiver under royal purview the possibility must exist for others to apply their own talents as potential contributors. With this in mind, the King sought to extend interest in the study of vetiver by granting the equivalent of US\$ 10,000 from the Privy Purse to establish the King of Thailand Vetiver Award. This award, first bestowed in 1992 and again on the occasion of the Second International Vetiver Conference (IVC2) in Thailand, is given to persons deemed to have conducted outstanding work in researching and promoting the use of vetiver



In 1993, His Majesty the King received the International Merit Award from the International Erosion Control Association

Recognition of His Majesty's Initiative

His Majesty not only paved the way for others to receive awards for outstanding work in the research and promotion of vetiver use, but was also a recipient of two prestigious, international rewards. The International Merit Award was presented to His Majesty in 1993 by the International Erosion Control Association (IECA) in recognition of the King's contribution to the use of vetiver for soil conservation and environmental improvement.

The second award was presented in October 1993 by Mr Richard G. Grimshaw, Chief of Agriculture Division, Asia Technical Department, World Bank. A vetiver expert himself, Mr Grimshaw presented His Majesty with a specially-commissioned bronze sculpture of a vetiver plant together with a certificate as the Award of Recognition "for technical and development accomplishment in the promotion of the vetiver technology internationally".

Thanks to the initiative of His Majesty the King vetiver has become well-known and accepted around the world for its properties and benefits that contribute not only to soil and water conservation but also in helping to reduce the risk of natural disaster caused by global warming.



The Royal Project





THE ROYAL PROJECT

Opium-based drug habits

Billed in 1969 as “The Woodstock Music and Art Fair: An Aquarian Exposition”, generally referred to as “Woodstock”, the organisers of this now famous counterculture concert originally hoped for a turnout of 50,000 people. They were taken aback when an unexpected, 500,000 young souls converged on Max Yasgur’s 1,000-acre farm near Bethel in upstate New York, USA to participate in an event that was tantalisingly advertised as “Three Days of Peace and Music”. The police turned a blind eye as young people “turned on, tuned in, and dropped out” on this iconic occasion, which proved to be a prelude to change around the world: Many in attendance used the event to expound far-out, contemporary ideals and principles that challenged the power structure of the United States of America. The concert went off peacefully, but not before the attention of the world was drawn to the growing use of drugs.

Towards the end of the 1960s, and by the time of Woodstock, the United States could account for around 350,000 heroin addicts in the country. Outside the United States, it seemed few were aware that opium-based drug habits were often fuelled unwittingly by hill tribe farmers in northern Thailand; poor and needy villagers, often on the point of starvation, struggling to make ends meet. This northern location covered almost one million square kilometres overlapping the mountains of Myanmar, Lao PDR, Vietnam, and Thailand. Commonly referred to as the Golden Triangle, it was once one of the world’s main sources of opium poppy production.





The use of opium was outlawed in Thailand in 1959



Opium poppy cultivation

Early evidence of opium poppy cultivation points to the Sumerians some 5,000 years ago, spreading outwards to Egypt and as far as the European Alps some 3,000 years ago. Poppies first arrived in East Asia and the Golden Triangle as a result of demand created by the British in the late 19th Century. About 100 years ago, hill farmers in China's Yunnan highlands began cultivating opium poppies. As the habit spread, opium was imported into Thailand.

World opium production saw a shift in the early 1950s when Iran and Turkey withdrew from the market. After 1949, Mao Zedong suppressed the cultivation of opium poppies in China forcing many hilltribe families to migrate, usually straight to the mountainous region referred to as the Golden Triangle. Through suppression, the communists effectively ended the habit of smoking opium in China, but a steady supply continued to go to the burgeoning markets in the West.

In Thailand, opium use ended in 1959 after it was declared illegal by the government of the day under premiership of Field Marshal Sarit Thanarat. Nevertheless, sales of opium – and its derivative heroin – continued to soar as a result of increased demand in the United States and Europe – and protagonists in the protracted war in Indochina.

The vast quantity of opium poppies that once thrived in northern Thailand covered a land area of 17,000,000 hectares, similar in size to the South American country of Uruguay. In fact, 9,000,000 hectares, found 5,000 metres above sea level, occupied a land area the size of Portugal. In terms of forested areas, northern Thailand's provinces of Chiang Mai, Chiang Rai, Lamphun, Phayao and Mae Hong Son account for around one quarter of the entire country's forests. It is no surprise, therefore, that this is where the majority of hill tribes were found including the Hmong, Yao, Lahu, Karen, Akha, Lisu, Lua and Chinese Haw.

Early farming methods

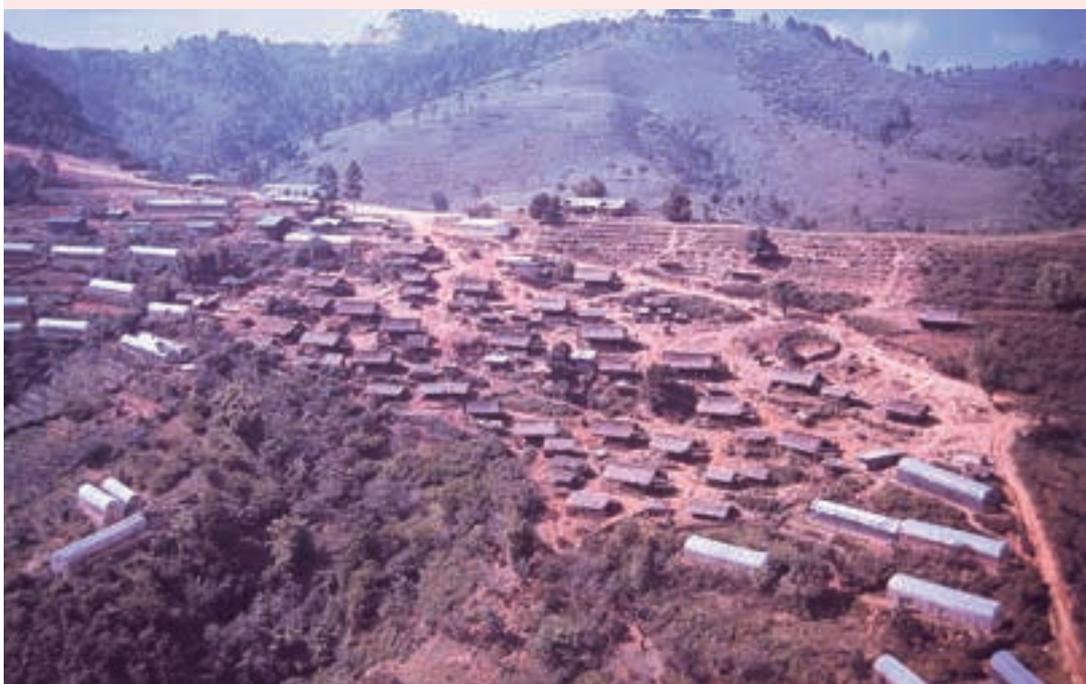
With the exception of the Karen and Lua, Thailand's hilltribe communities adopted swidden farming years ago on sloping land in the northern highlands at heights above 1,000 metres. Sometimes referred to as "slash and burn", swidden farming was the most common farming method undertaken. The steep-sided hills, with no flat ground in between, were unsuitable for conventional farming as practised in other parts of the world across flat fields at ground level. And, as latecomers to the area, most Hmong had to be content with high-lying land left over after other tribes had established themselves on the lowlands.

To farm on sloping land at such dizzying heights they burnt down trees to make ash for fertiliser. The farmers viewed this as a low cost method for rejuvenating the soil because, to them, the fertiliser came free of charge. The area was irrigated by the hand of nature, fed by water run-off from the steep slopes that easily drained and never became waterlogged. After the harvest, the farmers left the land fallow and moved their families to farm new slopes. This farming method was followed for years by generations of hill tribe farmers.

While swiddening may have been appropriate 100 years ago, because it left land fallow after each harvest and allowed a couple of years for it to recover, it was bound to create problems later as hilltribe families grew in number. Inevitably, the population boom among tribal folk occupying the same land area forced them to farm the same piece of land more frequently than before in order to feed their families. By 1969, 55,000 Hmong, and 275,000 villagers in total, fended for themselves on a fixed area of land that was becoming increasingly overworked.



Slash-and-burn farming triggered large-scale destruction on hillsides



Compelling reasons for growing opium

Poor road infrastructure in the past meant that some hilltribe villages were a six-hour drive from Chiang Mai. Transporting farm produce to market was not only difficult, but expensive because goods damaged in transit fetched a lower price.

On the other hand, opium buyers were quite willing to trek to hilltribe villages to buy at source saving the opium farmers having to make long journeys. This led to devious and shrewd buyers often setting-up impromptu gambling dens next to buildings where they bought the opium. Farmers were encouraged to gamble away their earnings minutes after being paid, with the unfortunate outcome that poverty continued unabated. On average, a farmer's income from opium was around 7,700 baht a year. Had they been able to get their lettuces to market in good condition, using this as an example, they could have earned as much as 180,000 baht a year.

Opium, a traditional painkiller used in the hills, was generally used to ward off hunger pangs. Up to the 1970s, these tribes were subsistence farmers that suffered from protein deficiency and malnutrition was endemic.

Former Associated Press bureau chief in Thailand, Denis Gray, witnessed the conditions that spawned a demand for opium in the North: "With no doctors on hand, opium became their preferred painkiller and it wasn't long before the drug became their master and their tormentor."

Lack of infrastructure made life difficult for villagers trying to get their goods to market





His Majesty the King supported national development as a means to help alleviate poverty

Communist insurgency slows development

In the Sixties and early Seventies, Thailand experienced a communist insurgency that hampered government officials trying to do their work in thirty-five out of seventy-one provinces. A major reason the communists were able to make headway was their appealing promise of social restructuring to help alleviate poverty among the local people. His Majesty King Bhumibol Adulyadej, however, was one among few who realised that national development was a more desirable option.

Subsequently, a small reforestation project was set up by Mr Thiam Komkris, dean of forestry. It was located just outside of Chiang Mai near Bhubing Palace, the royal winter residence located on a mountain called Doi Buak Ha, strategically located 1,000 metres above sea level. Professor Pavin Punsri, a plant scientist at Kasetsart University, responsible for introducing commercial grape cultivation to Thailand, believed it was possible to reforest the hills with income-generating orchards. But by 1969 a lack of funds threatened to shut down the Kasetsart project: At that juncture, destiny and coincidence collided.

Early activities to investigate crop substitution

Throughout the 1950s, His Majesty the King made frequent trips upcountry. The near-inaccessible hilltribe villages in the mountains were difficult to get to because of their remote locations many hours from a paved road. Today, it is difficult to imagine anywhere in Thailand being inaccessible. His Majesty recalled experiencing what he termed “disco roads”, referring to the shaking and bouncing suffered by occupants of the King’s car as it navigated unpaved roads deep in the countryside.

In 1968, the King might well have been more than intrigued to learn of the existence of a Hmong hilltribe village at Doi Pui not fifteen minutes from his Chiang Mai residence. As Dennis Grey recalled, “Information on the hill tribes was sketchy. The only way to truly assess their situation was to travel to the mountainous regions and gather research first-hand. Thailand’s King Bhumibol did just that.”

His Majesty trekked to one village along with some staff and began asking questions, later visiting more villages to ask more questions. No one would have been surprised if these poor, neglected villagers had paid scant attention to their royal visitor, but this was not the case. This particular royal visitor was able to gain their attention because His Majesty neither acted in a superior manner, “nor even much like a king.”

The King trekked to remote areas to consult with hilltribes





The financial reward from cultivating opium or peaches was similar

His Serene Highness Prince Bhisadej Rajani, the Royal Project's chairman, was able to witness this first hand: "The way His Majesty spoke to them...they were very friendly. The King took a keen interest in their lives. They were very frank with His Majesty. (One) particular day," recalled the prince, "His Majesty asked the Hmong what was their source of income apart from opium. They said peaches – the small local peach – and they told the King that the income from opium and from peaches was about the same."

It was a crucially important revelation: His Majesty knew the opium fields would be consigned to history if farmers could be persuaded to grow peaches in place of poppies – for a similar or superior income. The King requested Kasetsart University to earnestly explore the potential, at the same time donating 200,000 baht (around \$10,000 at the time) from private funds to set in motion in 1969 the Royal Hill Tribe Assistance Project. In 1980 this was renamed the Royal Project and later, in 1992, the Royal Project Foundation.

His Majesty the King and other members of the royal family began making frequent visits to hilltribe locations which entailed a lot of climbing. One story tells of His Majesty walking through a jungle and up a mountain because the King had heard about someone who had grafted three peach trees. Those around had questioned why His Majesty would want to view three peach trees. "Everyone said it was very tough on the King to walk for an hour to see three plants," Prince Bhisadej said. "But His Majesty knew that by going there it would demonstrate a keen interest. And that was good promotion for the plants."

The King was unconcerned about personal comfort. “There was a meeting arranged with some villagers,” Prince Bhisadej recalled. “And they came along and sat on the floor. In front of them were chairs. They were for us to sit in, which is normal. But His Majesty would not sit in the chairs; he sat on the ground with the villagers.”

Australian photographer John Everingham who accompanied the royal family on some visits recollected, “The interesting part was the approach His Majesty took; very often working right alongside the poppy fields, teaching people how to do things to make more money than from opium, but not going on campaigns to cut it all down. Some governments have done that and upset and angered the people.”

Denis Gray recalled the intense concentration displayed by the King on each visit. “The King was extremely focused on the details. As we all know, His Majesty always carries a map: so the first thing to do was to unroll the map and find out the exact location...where the opium fields were...or where a dam was going to be. From there, His Majesty went into precise details about facts and figures – things that an engineer or a social science researcher would want to know.”

From his own observations Denis Gray noted that His Majesty was “...not just a politician or a king coming in and breezing through. This (survey) was very, very specific; very, very detailed, and intensely focused.”

His Majesty, often accompanied by HRH Princess Maha Chakri Sirindhorn, was meticulous in ensuring surveys were specific, detailed and focused



One quirky tradition performed by the hilltribes when His Majesty came to visit at a later time puzzled some of the international visitors accompanying the King. People wanted to know why the villagers put a cloth on the ground for the King to walk on. Many thought it was some kind of superstitious practice, but Prince Bhisadej said they simply wanted to capture His Majesty's footprints, "It was like getting his autograph!" he said.



HM the King greeted by hill tribes villagers

Prince Bhisadej becomes Royal Project Director

In due course His Majesty asked Prince Bhisadej to be the director of the project. Although the Prince had visited hilltribes on past occasions, and accompanied His Majesty on regular fact-finding tours, he started his own serious exploration of the highlands. The Prince trekked to many villages for days on end carrying a sleeping

bag and other essentials in a backpack. Travelling with his frequent companion, Professor Pavin Punsri from Kasetsart University, Prince Bhisadej was able to learn the hilltribes' problems first-hand. "We didn't have much money and we had to act at their level...we could not behave in a superior manner. When I went out I carried my own pack, sleeping bag, boots...and I slept on their verandas."

Oddly, and without raising any suspicion, the tribes-people appeared to accept the many intrusions and questions. "They knew we were working for the King and they accepted us quite well," commented Prince Bhisadej. "They also knew we were not government officials who would try to stop them from growing opium or something..."

In one location, around Doi Inthanon (Thailand's highest mountain) Prince Bhisadej found Hmong tribal members that had been sent to Hanoi by communists for training.

"During the day it was okay," Prince Bhisadej recalled. "The forestry people would pull out before dusk and go down the mountain fearing they might be killed. Quite a few people were killed – forestry people and the like. Because the government couldn't go and help these people they became very poor... (So) we went up."



Prince Bhisadej, the Royal Project Director (left) among the hilltribe villagers



Early experiments with strawberries

Strawberry cultivation was the chosen crop for tribes in the Doi Inthanon region because farmers could expect a return on investment three months after planting the crop. The three Hmong men selected to attempt growing strawberries accepted the proposition because they knew it was part of the King's project and that His Majesty wanted to help them improve their incomes.

"From the very beginning money from the harvest went into their pockets straight away," said Prince Bhisadej. "We took the produce to market for them and they got the money. The three men accepted the idea to grow strawberries because it was the King's project. The next season a lot more people wanted to grow strawberries."

By 1988, those who had mastered strawberry cultivation were earning the Thai baht equivalent of \$2,000 a year – double the average income in Thailand. Others, growing Japanese apricots, earned \$1,000 from one-hectare orchards.



Hilltribe villagers earned substantial revenues growing strawberries

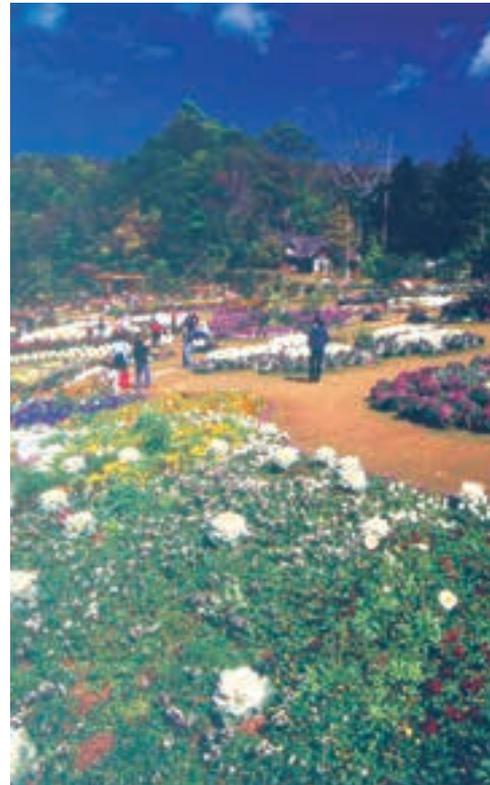




Ang Khang valley is ideal for cultivating temperate-climate fruit trees

Work commences at Ang Khang

Located in the northwest of Chiang Mai province, close to the border with Myanmar, Ang Khang valley is five kilometres long and rises 1,400 metres. Enclosed by even higher, limestone peaks, this remote area mirrors scenes from the novel “Lost Horizon”; best remembered as the origin of the mythical Shangri-La. The pristine slopes were once covered with poppies amidst a profusion of wild apples, local peaches and other fruits. But it was the temperate climate that first attracted the Royal Project team to the area; they considered it eminently suited for cultivating temperate-climate fruit trees. Enthusiastically, Royal Project members acquired European text books to learn how to grow temperate-climate trees only to come up against a new problem: “Our temperate fruit textbooks couldn’t be used in Thailand because the micro-climate isn’t the same,” explained Dr Santhad Rojanasoonthon, the then chairman of the research section of the Royal Project Foundation.





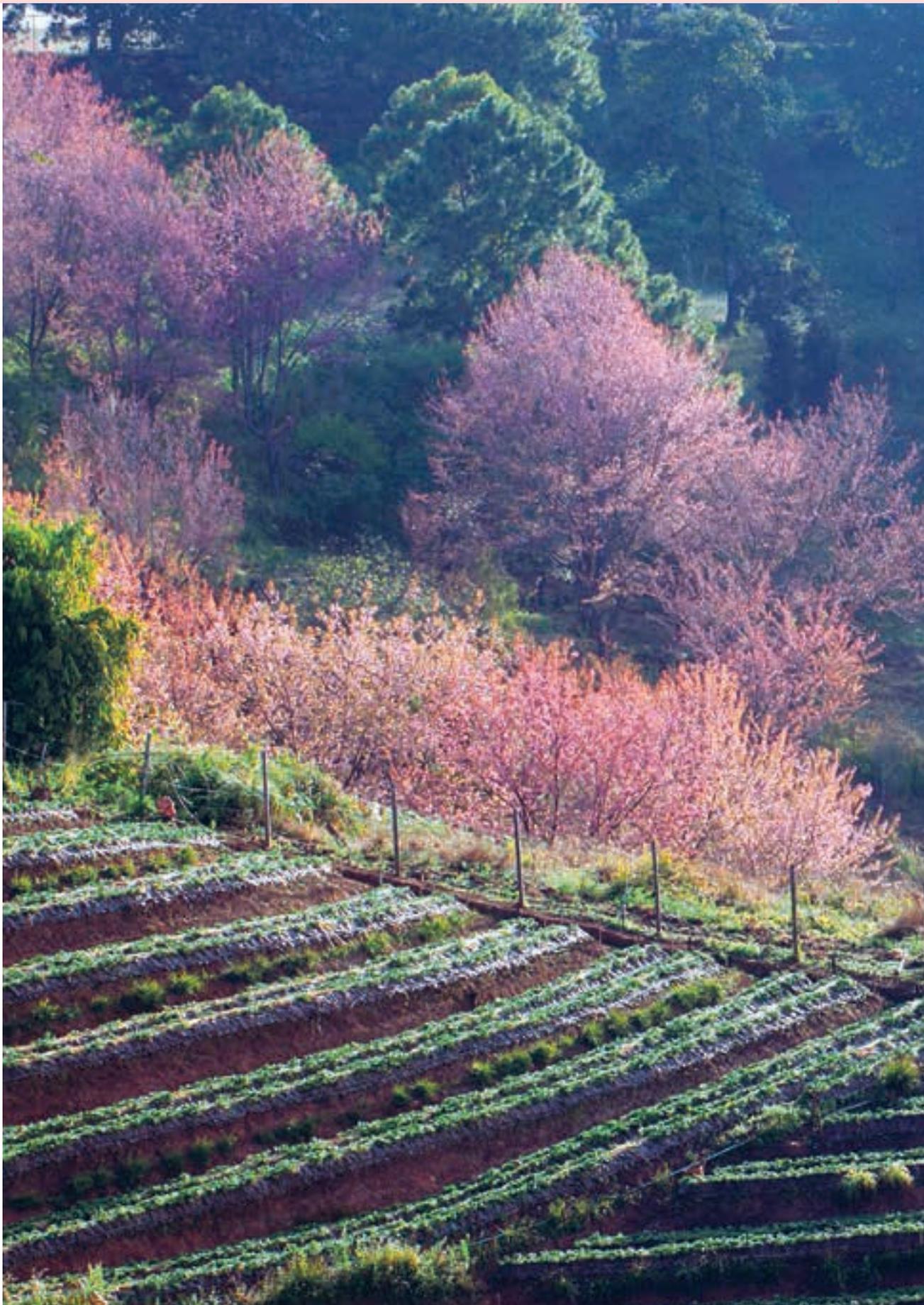
The project yields a wide-variety of temperate-climate fruits

Introduction of peach trees

Subsequently hilltribe communities were provided with some “introduced” peach tree varieties for cultivation that earned the farmers an average price of around thirty Thai baht per kilogram, depending on the size of the fruit. Apart from peaches, the project team considered cultivating highland staple food crops like rice, wheat, maize, beans and potatoes. Today, the project produces a wide variety of temperate-climate fruits including Chinese peaches, Chinese pears, persimmon, plums, grapes, Japanese apricots, strawberries, passion fruit, and figs. Other fruits, like kiwi, pomegranates, raspberries and blueberries, are undergoing research.

A team surveyed hilltribe farmers to see whether they would be willing to grow site-specific fruits, nuts, or vegetables. Afterwards, they supplied the farmers with plants or seeds and supervised the first planting followed by a period of monitoring. This was not intended as a free service: His Majesty was aware that nothing of value was ever given away free; there was always a small charge for everything. This approach served to impress upon the hilltribes the real value of the work being done under the Royal Project.





Social assistance

Not all villagers are domiciled in highland areas; some are at quite low elevations deemed unsuitable for growing temperate-climate fruits and vegetables. To compensate, additional support is offered by development centres and government agencies through schools, medical care, sanitation and hygiene, social development and the opportunity to develop alternative incomes from non-farming jobs.

Though hilltribes adhere to a male-dominated culture, women have to undertake a disproportionate amount of work in tandem with bringing up their children. The Royal Project Foundation arranges for young girls to learn about children's rights and teaches female empowerment. Its youth vocational development programme offers supplementary occupations and a way of earning a living in non-agricultural jobs. The programme has the added benefit of assisting young people to steer clear of becoming victims of human trafficking and prostitution.

Agricultural extension programmes are a typical example of how to raise the capability of hilltribe farmers; one aim being to make the crop safe. This ensures the products achieve an acceptable standard in terms of quality. The project helps farmers achieve Good Agricultural Practice (GAP) certification for their crops, verifying that products are free from unsafe levels of chemicals. By satisfying customers about food safety, they can also compete with imported foodstuffs.



Hilltribe women undertake a disproportionate amount of work

Deforestation and reforestation

Years of indiscriminate swidden farming resulted in large-scale deforestation in the mountains. Concerned about this, His Majesty offered to provide compensation to hilltribes for crops grown on tracts of land used in research work under the Royal Project. This was seen as an unconventional approach bearing in mind that the hill-

tribes were living illegally in a watershed area. “His Majesty said that they were here first,” recalled Dr Santhad. Officials were advised by the King to let the tribes stay rather than go elsewhere where they would possibly destroy other tracts of land.

To reforest the hills and rehabilitate the Ang Khang watershed, the Royal Forestry Department introduced new, fast-growing acacias, pines, and cedars. The King also suggested introducing three types of wood for four types of use, one of His Majesty’s sustainable development theories.



To enhance reforestation, the Royal Forestry Department introduced new, fast-growing trees



His Majesty explained: “Growing three types of forests yields four benefits: Apart from the obvious gains of fruits, timber and firewood, there is the important, fourth benefit of soil and watershed conservation.”

The practical benefits of this campaign ensured a sufficient supply of wood for material needs so it was not necessary to fell more trees for domestic use. Reforested areas were preserved more efficiently than simply banning people from cutting down any trees at all.

The Royal Project’s forestry programme was conducted in partnership with Taiwan. A demonstration plot with a seedling nursery built at Doi Ang Khang yielded 1.2 million seedlings between 1982 and 1994. The saplings helped preserve the forests. Fruit trees played a major role in reforestation because they are almost never removed, or burnt accidentally, because they are planted as an orchard.





One demonstration plot yielded 1.2 million seedlings between 1982 and 1994

Road infrastructure

In the early days of the project, paved roads in the mountains were few in number. Everyone involved was aware of the urgent need for a practical solution to get the farmers' produce to market. The hard work and effort put into the planting phase would not bring in any income if fruit and flowers were overripe, bruised or shrivelled before reaching market.

Consequently, the project team sought the assistance of the Rural Development Highway Department to construct a twenty-two kilometre road from the valley to the lowlands giving access to the markets. Prior to that, everything had to be carried on the backs of pack animals or in helicopters. Even the basic roads built in the early days of the project tended to become waterlogged after torrential downpours. As Dr Santhad recalled, "We had to use chains on the wheels to drive through the mud."



The Rural Development Highway Department laid paved roads to help villagers get their produce to market





National and international cooperation

Domestic and overseas co-operation proved invaluable in furthering the objectives of the Royal Project.

The Royal Pang Da, Inthanon, Ang Khang, and Mae Lod research stations together with thirty-eight Royal Project Development Centres, all house researchers and volunteers from several Thai universities and government agencies. They work as volunteers in the name of His Majesty. Most of the research is actually done by universities, technically working under the Royal Project only because work in watershed and protected areas is strictly controlled.

A successful outcome could never have been achieved without the participation of national institutes and agencies unified by a sense of purpose inspired by His Majesty the King. Some of the contributing organisations involved include Chiang Mai University, Kasetsart University, Maejo University, Ministry of Agriculture and Cooperatives, Department of Industrial Promotion, Ministry of Industry, the Border Patrol Police as well as direct assistance from the Royal Thai government. Strategically, considerable research assistance came also from the Thailand Institute of Scientific and Technological Research of the Ministry of Science and Technology.

On the international scene, His Majesty had already developed strong ties with overseas countries as a result of his many visits abroad in the Sixties. When His Majesty mentioned to members of the diplomatic corps the new Royal Project to develop the North, the king received enthusiastic and immediate support from embassies in the form of donations of temperate and semi-temperate fruit trees. Counted among the donor countries were Australia, France, Indonesia, Iran, Israel, Italy, Lebanon, New Zealand, the UK, and Germany.

Dr Shen Chang-huan, ambassador to Thailand for what was then Chinese-Taipei, when made aware of the new Royal Project, notified his government of Thailand's need for fruit saplings, vegetable seeds, and expert assistance to develop mountain agriculture. His request met with a positive response. For many years the Vocational Assistance Commission for Retired Servicemen (VACRS) – Kuomintang army veterans – had developed temperate-zone fruit plantations in Taiwan's own central highlands. VACRS chose Mr Soong Ching-yun, deputy director of one of the farms, to visit Thailand to conduct a first hand assessment of the situation.

Early in 1971, "Papa Soong", as he is still fondly referred to by local folk, began planting saplings flown in from Taiwan. The results were positive. Later, Taiwan was instrumental in setting up the Royal Agricultural Station at Ang Khang and a Taiwanese team agreed to stay in Ang Khang indefinitely to establish a cooperative relationship with the Royal Project.



The Royal Project attracts visitors from all around Asia, and further afield

In the spirit of international co-operation, Australia provided 1,500 saplings along with rust-resistant varieties of Arabica coffee developed in Papua New Guinea. Later, Prince Bhisadej commented that a start had been made: “We have introduced the Arabica coffee bean. Before, it was planted in a research station but was not grown commercially...”

Led by Kasetsart-trained experts, small teams of young Thai graduates went into hilltribe villages to introduce coffee and other crops like kidney beans. Thai scientists in the programme pioneered a technique to introduce successful research into villages. It was discovered that profits from coffee surpassed those from fruits and vegetables. The project’s poverty elimination campaign saw other hill farmers growing coffee, fruits and garden vegetables that yielded profits two to three times higher than opium. The drive to introduce substitution crops was fast becoming a one-way street of accomplishments!

The project also attracted the attention of the United Nations Development Programme (UNDP) and the United Nations Fund for Drug Abuse Control (UNFDAC) which established a fund to finance by 1988 some seventy research programmes connected with the Royal Project’s research centres. UNFDAC set up an office in Chiang Mai.

Profits from coffee, fruits and vegetables were up to three times higher than from opium cultivation





The cultivation of flowers was suggested as a substitute for opium poppies

One day, while visiting UNFDAC, Prince Bhisadej met four representatives of the Agricultural Research Service (ARS), a division of the US Department of Agriculture (USDA).

“The ARS funds research work only. They came to Thailand scouting for government agencies interested in finding replacement crops for opium,” Dr Santhad explained.

Prince Bhisadej remembered the occasion: “So, the USDA-ARS came along trying to find people to give money to. They were just about to leave Thailand when I met them. I asked them to come to my house for dinner and I asked Professor Pavin – the fruit man – and some other people along. So we had a talk and we got a lot of money from them. There were separate projects like fruits, flowers and so on.

“I proposed cultivating flowers to the USDA people and they thought it would not work because flowers are very delicate things and the hilltribes are very rough people! Well, we suggested they compare it to opium; the opium flower needs a lot of delicate work and you have to look after the plant very well and have a lot of patience.”

Finally, the USDA gave 3,000,000 baht to the Royal Project to start a flower project free from any overriding conditions, thanks largely to the trust engendered by His Majesty and the respect gained through the King's work.

The additional financial support resulted in a substantial expansion of the Royal Project. Research was conducted into the practicability of raising strawberries, potatoes, onions, silkworms, dye plants, mushrooms, and a variety of chrysanthemum called pyrethrum used in making insecticides. Altogether, eighty-four projects were funded by the USDA between 1973 and 1987. Dr Santhad recalled with some humour that the USDA-ARS imposed a strict discipline on Thai researchers: "The ARS really forced everyone to write long and detailed reports!"

In time, USDA funding was phased out but the project still received around one-third of its annual budget of 72,000,000 Thai baht from external sources. Another third continues to this day to come directly from the Privy Purse and the final third from the Royal Thai Government. The United States, the UN Food and Agriculture Organization, UNDP, and Taiwan continue to provide substantial financial backing for work undertaken by the project.

"More, and regular, government funding came when the Royal Project became a foundation," Dr Santhad observed. The government, he explained, was able to set aside funds annually for a foundation, whereas support for a private entity was less regular.

The USDA gave the Royal Project 3,000,000 baht to start a flower project





Research at Suan Song Saen

An experimental station for temperate zone fruit trees was established by the Royal Project at Suan Song Saen, Doi Pui, on the outskirts of Chiang Mai, some 1,220 metres above sea level. A team of plant specialists from Kasetsart University began work grafting Australian peaches to local root stock. They tested other temperate-climate fruits for suitability at that altitude. Researchers learned that Australian peaches, at that time, were not suitable for local cultivation because they need a longer period of chill than could be provided in the northern Thai climate at Suan Song Saen.



The Royal Pang Da Research Station propagates plants to substitute for opium poppies

Royal Pang Da Research Station

Further research work was conducted at Royal Pang Da Research Station some 47 kilometres northeast of Chiang Mai. This station was originally set up as a plant propagation site for temperate trees. However, the station's convenient location, and its easier access to water from a nearby dam site after the station was expanded, meant work could be expanded to cover a greater variety of plants catering for all 38 Royal Development Centres. Various methods of propagation are performed here including layering, grafting by stem cutting, bud cutting and cutting with local rootstocks.

Many of the Royal Development Centres are below 1,000 metres above sea level. As this research station is only 700 metres above sea level more research work has been performed there on semi-tropical plants such as strawberries, avocados, papayas, mangos and lychees as well as flowers including roses and chrysanthemums.

The Royal Pang Da Research Station, therefore, is one of the main research stations for propagating plants used to substitute for opium cultivation. Other crops cultivated at this station, such as fruit trees, help to rehabilitate and sustain the local environment.



Fruit trees provide environmental protection

Inevitably, the question arose as to why deciduous fruit trees were chosen for Thailand's northern region: They take a long time to reach maturation to produce fruit and they require constant attention. Whilst that is true, it is also a fact that deciduous fruit trees are well-suited to heights above 1,000 metres; heights where opium poppies are cultivated. Moreover, they are a long-term investment and the Royal Project was focused on creating long-term enterprises. With care, the time invested in fruit tree cultivation could achieve this objective.

At high altitudes, and on hillsides sloping greater than 30 degrees, these fruit trees grow into natural, productive forests that help bind the soil, trap nutrients and slow-down water run-off to lower areas. Later, His Majesty also introduced vetiver grass known for its dense root system as an efficient binder of sloping land. Subsequently, the North became a centre for royal investigations into the properties of vetiver in preventing soil erosion and topsoil degradation.

Fruit trees take four to five years to become productive. In the interim, farmers have to cultivate faster-growing cash-crops like vegetables and flowers. Over 50 different kinds of vegetables are grown in the Royal Project area including brussels sprouts, leeks, celery, zucchini, turnips, japanese cucumber, parsley, chinese cabbage, potatoes, radishes, fennel and endives. By integrating deciduous fruit tree cultivation with vegetables, farmers were able to enhance food security and, in time, they were bound more closely to their land. Eventually, this ended the farmers' nomadic way of life that had supported indiscriminate methods of opium poppy cultivation largely



responsible for the destruction of around 4,000 hectares of forest by 1987. This crucially important point led to the Royal Project placing great emphasis on fruit tree cultivation.

Villagers also formed community forestry groups to preserve forested areas and to educate others of the need to conserve and prevent soil erosion. The Villager Forest project educated villagers to fell trees for timber or firewood in selected and approved areas, and informed them where not to fell trees. In return for permission to cut down some trees, villagers were asked to plant tree saplings in other locations to help the process of reforestation.



The North became a centre for studying vetiver grass as a means to prevent soil erosion and topsoil degradation



Self-help through self-management

The Royal Project team was faced with a philosophical dichotomy: should the project be a “provider” or should the team teach villagers to practice self-help? Theoretically, the Royal Project could continue to help villagers indefinitely; or teach self-sufficiency so villagers could stand on their own feet. Give a man a fish and you feed him for a day; teach him how to fish and you feed him for life. The project chose to teach self-help through self-management.

As a matter of policy, hilltribes in the project area are encouraged to form self-help entities, particularly rice banks, production groups, and cooperatives. Cooperatives are a well-known starting point for self-management of a community and form a part of His Majesty the King’s “New Theory” of development.

Poor farmers lack the capital needed to launch a business, or to keep a business going through difficult times. This problem was addressed by the Royal Project by providing credit to finance agricultural development or maintain rice and food banks. The Bank of Agriculture and Cooperatives provides credit to some centres to ensure farms survive. Over the years, this form of cooperation with the bank has continued to grow.

No one wants to see the return of hunger pangs forcing people back to cultivating opium poppies. For convenience, rice banks have been set up in several villages where rice can be borrowed for immediate consumption against the next harvest.

At the end of the season, borrowers replace the “borrowed” rice so there is always a reserve of “food capital” available for the next person or family.



Some villages have their own “rice banks”





Health care and drug addiction

Those engaged in the Royal Project were quick to realise that close attention had to be given to the physical wellbeing of villagers. In the earlier days, a large number of hilltribe people were malnourished and prone to the kind of diseases the developed world could only gasp at in amazement. Subsequently, villagers in need of health care, nutritional advice, guidance on family planning and the like were visited by doctors and nurses from Chiang Mai University Hospital. Medical teams complemented vaccinations for common childhood illnesses such as polio and rubella by concentrating on virulent, Asian-oriented illnesses like Japanese encephalitis B. Government clinics in development areas provided assistance in terms of general medical care.

In a region that for years had been afflicted by uncontrolled opium cultivation, drug addiction was an important but totally unacceptable spin-off that had to be addressed and eliminated. Without able-bodied farmers, the Royal Project's crop research programme could never be implemented by the target group. In 1983 the foundation's treatment programme was expanded when it became obvious that treatment centres in Chiang Mai would not be able to cope with the problem.

Providing essential health care for villagers



“It is a habit, like smoking,” commented Prince Bhisadej. “But these hilltribes...they smoke opium not tobacco. It is also medicinal. If you’ve got a bad stomach, you smoke opium. It is used as a medicine and also if you work hard and it’s cold you smoke opium and it’s very relaxing.”

The detoxification programme includes classroom education and support groups. Surprisingly, many addicts want to break the habit; they want a better life, and see the Royal Project’s campaigns in an attractive light because the campaigns are not coercive even with the active support of the police and paramilitary Border Patrol Police. Generally, police try to prevent drugs from entering each community and help to rehabilitate users. But they are tough on dealers. Everyone, it can be said, plays by the King’s rules.

Nong Hoi, one of the project’s key villages, conducts regular detox campaigns. The village headman explained why the Royal Project’s detoxification and education campaign were important: “We started the project because we could see the waste. The Royal Project would not get anywhere if the people involved were addicted to narcotics.”

Addicted villagers felt it was time to stop. Mr Neng, a 40-year-old addict for twenty years explained: “The Border Patrol Police informed me of this programme under the Royal Project. I joined because I wanted to stop. They are stopping it everywhere these days...I have nowhere left to go.”



The physical wellbeing of villagers is essential in the fight against poppy cultivation



Formal education in villages

The Royal Project Foundation works not only with local authorities to provide basic education to hilltribe villagers but also to teach agriculture and forestry. Children are also instructed to stay clear of opium and the undesirable aspects of drug abuse. Schools can be found in areas where few teachers would be prepared to live. Instead, it is left to Border Patrol Police to provide education in conjunction with primary education authorities.

To meet this requirement, primary education schools are established in some villages or within walking distance of a village, and run by the government following a standard curriculum. The foundation provides scholarships for some children to continue their secondary education in Chiang Mai or Chiang Rai.



Children are schooled to understand the undesirable effects of drug abuse

The Royal Project buys products directly from farmers for marketing throughout Thailand





Marketing and sales

Introducing new cash-crops to farmers was essential but that alone was not enough; the farmers' produce had to be marketed and sold. In 1985 the Royal Project established a marketing arm with project staffers and volunteers who bought fruit, vegetables and other products directly from the farmers at the prevailing market price less twenty percent to cover expenses.

"We have marketing both here [Chiang Mai] and in Bangkok; cold transport and lorries," explained Prince Bhisadej. "Our market is mostly Thailand, but we have one food processing unit here at Chiang Mai University. I think they are doing guava juice now. There is one at Mae Chan in Chiang Rai. They export frozen strawberries and baby corn."

In effect, the marketing team buys around one third of the produce to sell on to urban areas. The rest is sold locally and to visiting tourists. Project volunteers grade, package and sell the produce. The project earns annual revenue of around \$13,000,000 from highland farmers.

As part of the project, three, small-scale canning plants were set up at Ban Yang in Chiang Mai, Mae Chan in Chiang Rai, and one at Chiang Mai University (mainly for research) to process the hilltribes' and lowlanders' agricultural produce. It took time to get fruits to market with the result some were already ripe or overripe before they could be sold. Food canning plants address this problem.

"The King's idea was not to throw ripe peaches away but to have them canned instead," explained Dr Santhad.

The first food-processing plant was set up in Ban Yang in 1972; the other one in Mae Chan was set up in 1975 and was very successful. Today it is called the Doi Kham Food Processing factory producing over 100 different products. The earlier factory in Ban Yang, Chiang Mai processed canned products for thirty years before being turned into a museum set up under the auspices of HRH Princess Maha Chakri Sirindhorn. However, the original food processing plant is still in operation even though a new plant has been opened.



Canning factories ensure surplus produce is not wasted



Royal Project brand

Product branding and distribution

In due course the foundation developed product branding and distribution in Thailand to support the agricultural produce grown under the auspices of the Royal Project. In Chiang Mai, Chiang Rai and Bangkok, hill-grown products like tomato juice, lychee fruit, bamboo shoots, baby corn are processed into jams or canned goods for local distribution and for export. Products sold within Thailand carry the brand name Doi Kham (or Golden Mountain), instantly recognised nationally as the logo of His Majesty the King's project. Fresh produce, on the other hand, is stamped with the "Royal Project" brand and distributed nationwide through many outlets including the large, international supermarket chain Tesco-Lotus.

Royal Project produce also enjoys international exposure on routes flown by Thai Airways International one of the foundation's largest and most important customers. Each day, the catering department of Thailand's national airline prepares around 7,500 in-flight meals for 48 different airlines serving Bangkok international airport. By supporting the Royal Project, THAI's catering department plays a major role towards improving the quality of life of hill tribe people in addition to bringing high quality products to the attention of the airline's domestic and international customers.

Working in conjunction with the foundation, THAI complies with international standards for product specification. EurepGAP (GAP being an acronym for Good Agricultural Practices) is a common standard for farm management practices created in the late 1990s by several European supermarket chains and their major suppliers. The aim was to introduce conformity among different retailers' supply standards, which had hitherto created problems for farmers. Today, it is the world's most widely implemented farm certification scheme initially used in Europe. Following improvements, it developed into a worldwide standard known as Global GAP Today, these standards encourage farmers to develop high quality fruits, vegetables and other agricultural products.





Former Mandarin Oriental Bangkok executive chef Norbert Kostner, an advisor to the Royal Project Board, evaluates produce with Prince Bhisadej, the prime contributor to the success of the Royal Project

In Bangkok, several well-known, five-star luxury hotels carry Royal Project products because of the proven quality and freshness of each item. One of the better-known (and a long-standing customer) is the renowned Mandarin Oriental Bangkok. The former hotel's long-serving executive chef Norbert Kostner, an advisor to the Royal Project board since 1993, gives advice on just about everything from the ideal, fully-grown size of a cabbage to the preferred size of a rainbow trout! There are subtle reasons for such idiosyncrasies: Whereas most Asians prefer to share a fish meal among friends (the bigger the fish the better) a restaurant in an upscale hotel must serve a fish that fits the plate of a single guest.

Mr Kostner's advice was supplemented by practical assistance: "I went to Italy and brought back a lot of seeds, but more like the kitchen-garden varieties. They started growing these under the auspices of the foundation...and they grew beautifully...from basil to rosemary to sage."

The Royal Project gradually expanded to the point where it was no longer just producing and marketing fruits, vegetables and flowers: In a valley next to Doi Inthanon, Hmong and Karen hilltribe farmers successfully produce around 1,800 kilograms of rainbow trout each year to be sold in city restaurants.

Assistance to foreign countries

As the Royal Project grew more successful, requests for assistance poured in from neighbouring countries, with Myanmar, Yunnan province in southern China, and Lao PDR among the first.

Today, Myanmar is second only to Afghanistan as the world's largest source of opium and they are most anxious to find a practical solution. In time, the foundation was contacted by other countries, including Columbia, Peru, Bolivia, Mexico and Pakistan, all seeking assistance to address their own drug crop problems

In Afghanistan, in 2008, around 157,000 hectares had been given over to opium poppies according to the United Nations Office on Drugs and Crime (UNODC) which has an office in Bangkok and offices in other affected countries. The director of UNODC in Afghanistan, Antonio Maria Costa, estimated the Taliban earned some \$100,000 from the opium trade in 2007 alone.

Gary Lewis of the UNDOC in Bangkok said, "There's a lot to be learnt from what we have achieved here. What we need to do is to try to stabilise the situation (in Afghanistan) ...and in such a way that we can establish an environment for the kind of interventions that have proved successful in Thailand."

Dr Santhad is less sanguine, believing it is perhaps unrealistic to emulate the success of the Royal Project in countries like Afghanistan "...until they cease fighting."



Afghanistan is seeking a practical solution to address its opium problems

Reasons for success

Asked to comment on why the Royal Project has enjoyed such success, project director, Prince Bhisadej summed it up succinctly: "...through the money getting into the pockets of the hill tribes...they are driving cars!" Perhaps a less epigrammatic answer lies in His Majesty's inclination to tackle the root cause of problems -- not just the symptoms -- by treating poor and marginalised people with compassion underpinned by a steadfast, scientific approach to convince farming communities it is in their best interest to cultivate peaches instead of poppies.

Consequently, the Royal Project's achievements discounted the more drastic solution of destroying poppy fields (and the farmers' sole source of income) by, instead, introducing alternative crops with yields the same or greater than opium sales. But more than crop substitution, important though it is, the Royal Project set out to improve the quality of life of villagers through education in primary health care, the treatment of drug abuse, and improved educational opportunities. Thus, under His Majesty the King's guidance the Royal Project endorsed a holistic approach

Throughout the process, preservation of the environment was of uppermost concern in the minds of Royal Project practitioners. A three-pronged approach led to the cessation of harmful "slash-and-burn" practices; the introduction of practical



His Majesty King Bhumibol Adulyadej, the world's "Development King"

applications to preserve environmental resources such as water, soil and forestry and, thirdly, management of any adverse consequences resulting from highland agricultural development.

In the first instance, slash-and-burn techniques were eliminated along with opium poppy cultivation. Secondly, the Royal Project drew up extensive plans for reforestation and soil and water conservation. Thirdly, the Royal Project began helping farmers to manage the adverse consequences of agriculture development such as avoiding the harmful use of chemical pesticides and fertilisers.

Apart from its tangible success, the Royal Project has received recognition of another kind by winning the Ramon Magsaysay Award in 1988 for International Understanding; and later the Colombo Plan Award in 2003 which identified it as the world's most outstanding opium-replacement project, and the only scheme to successfully eradicate opium poppy cultivation through positive measures.

His Majesty the King's empathy with the plight of one of the poorest segments of society has made Thailand's king one of the most respected development scientists in the world. The United Nations Development Programme (UNDP) in 2006 presented His Majesty with the first-ever Lifetime Achievement Award in recognition of the King's work. As he personally bestowed the award on His Majesty, UN Secretary-General Kofi Anan said:

"Your Majesty has made an extraordinary contribution to human development. As the world's 'Development King,' Your Majesty has reached out to the poorest and the most vulnerable people of Thailand -- regardless of their status, ethnicity or religion - - listened to their problems, and empowered them to take their lives in their own hands."





Dr Stephen Northcliff, Chairman of the International Union of Soil Sciences, presented His Majesty with the Humanitarian Soil Scientist Award

World Soil Day

The economic and financial committee of the 68th United Nations General Assembly adopted a resolution recognising December 5, 2014 – His Majesty the King’s Birthday – as World Soil Day, and 2015 as the International Year of Soils.

The objective of this is to raise and promote awareness of the importance of soils towards agricultural development, nutrition, and food security at both national and international levels, to address challenges posed by sustained growth in the world’s population.

Subsequent to the 17th World Congress of Soil Science, held in Bangkok in 2002, over 1,000 executives and members of the International Union of Soil Sciences recognised the importance of HM King Bhumibol Adulyadej’s work in the field of soil resources development particularly agricultural development.

Two main projects were initiated by His Majesty – Klaeng Din and the Royal Project – to improve sustainable soil management.

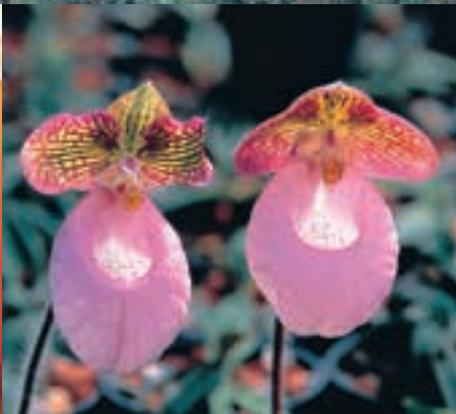
Under the Royal Project, the aim is to assist in the sustainable development of highland areas in northern Thailand. By applying positive measures, this project has eradicated the cultivation of opium poppies by means of crop substitution. Thailand is the only country in the world to achieve success in implementing these projects. His Majesty once said, “One of the objectives of this project is for humanitarian principles. This means that those living in remote areas will be equipped with knowledge and able to stand on their own feet and enjoy prosperity.”

At an audience granted by His Majesty on April 16, 2012, Dr Stephen Northcliff, former Secretary-General of the International Union of Soil Sciences, presented His Majesty with the Humanitarian Soil Scientist Award, thus honouring the King as the world’s first recipient of the award for dedication to soil resource management. It was he who also requested that His Majesty’s Birthday should be declared World Soil Day.



Doi Tung Development Project







HRH the Princess Mother was determined to raise the quality of life among villagers and reforest barren hillsides

DOI TUNG DEVELOPMENT PROJECT

Deforestation in northern Thailand

As far back as the 1960s, Her Royal Highness Princess Srinagarindra, the late Princess Mother, saw first hand the cause and effect of swiddening (slash-and-burn) farming to clear forested hillsides in northern Thailand to grow opium poppies. For generations, poppy cultivation had provided hilltribes with a means of earning a meagre living but the price was high, paid in terms of human suffering and environmental degradation – an untenable and wholly unacceptable outcome.

Out of humanitarian concern, the Princess Mother vowed to not only reforest the barren hillsides but, more fundamentally, to elevate the quality of life of local people by eliminating the cause of their predicament – poverty and lack of opportunity. Poor and needy villagers, Her Royal Highness maintained, had to have access to education, health and welfare programmes to enable them to earn a wage without having to resort to indiscriminate farming techniques that was turning their environment into a barren wilderness. It was a lofty goal that became a cause célèbre not only for the Princess Mother, but also the many people who rallied to the cause.





The Princess Mother's granddaughter, HRH Princess Sirindhorn, and the Princess Mother's daughter, HRH Princess Galyani also travelled to remote areas

It was to be a long, but worthwhile journey with much of the Princess Mother's vision-for-change enshrined in the successful outcome of many projects that had their roots in the Sixties, culminating with the Doi Tung Development Project, which saw the reforestation of once barren hillsides on Doi Tung Mountain and its surrounds. This was, and still is, a holistic and integrated Sustainable Alternative Livelihood Development initiative that today enjoys international acclaim.

Although the Doi Tung Development Project has several years to run to complete its thirty year time frame, the management and staff of the Mae Fah Luang Development Foundation (MFLF), who oversee the project, have responded positively to calls to help communities in some ASEAN countries such as Myanmar and Indonesia and even Afghanistan.

Celebrating the centenary anniversary of the late Princess Mother in 2000, UNESCO Secretary General Koichiro Matsuura said Her Royal Highness had shown the world how individuals can contribute to development. By starting small, with determination and commitment, the Secretary General said, the Princess Mother had shown how to reach one's goals.

Scenic view of Doi Tung Royal Villa



HRH Princess Srinagarindra, the Princess Mother of Thailand

Born on October 21, 1900 into a goldsmith's family in Thailand's Nonthaburi Province, Sangwan Chukramol (destined to be mother to two kings) was the third child in a family of four. She endured a tragic start to life when her elder brother and sister both died while they were quite young. And by the time Sangwan Chukramol was nine she had also lost both parents and had but one remaining sibling. Her aunt, Suay, who earned a living making sweets, became Sangwan's guardian.



*The Princess Mother
as a teenager*

From these humble beginnings, the young Sangwan, who became an avid reader (particularly Thai classics) was despatched to live with another relative who was nanny to Princess Valaya Alongkorn, the Princess of Phetchaburi, daughter of King Chulalongkorn (Rama V) and Queen Savang Vadhana. Sangwan soon found herself presented before the royal court in the manner deemed proper for young Thai girls. At that time, her only duty was to be present at a twice-daily audience with the Princess. Occasionally, she would be asked to join the Princess' entourage on visits to Queen Savang Vadhana at Suan Hongsa Royal Villa in the grounds of Dusit Palace in Bangkok.

Later, she attended school while living with Huan Hongsakul, the nanny of Prince Mahidol Adulyadej, Prince of Songkla, the younger brother of Princess Valaya Alongkorn.

Sangwan the student nurse

An accident with a sewing needle heralded the start of young Sangwan's nursing career. Fortuitously, her injury was attended to by the court physician, Phraya Damrong Baedyakhun, in whose house she stayed while continuing her schooling. Sensing that Sangwan seemed rather lethargic and despondent, the doctor felt compelled to try to improve her demeanour. Would she be interested, he enquired, in studying nursing? Indeed she would, she replied without hesitation.

At just thirteen years of age, in 1913, Sangwan was enrolled as a student at Siriraj School for Midwifery and Nursing. As a scholarship student, and with just fifteen baht a month for expenses, she agreed to work for the hospital for three years. After graduating in 1916 she joined the hospital's nursing team. In the following year, Prince Rangsit Prayursakdi, director of



the Royal Medical College of Siriraj Hospital designated two doctors and two nurses (one being Sangwan) to further their studies in the United States of America. The medical scholarships were provided and funded by Prince Mahidol Adulyadej (in later years renowned as the Father of Modern Medicine and Public Health of Thailand). Prince Mahidol's mother, Queen Savang Vadhana, sponsored the nursing courses.

Before Sangwan could travel she had to acquire a passport. For that she needed a surname, which, for people, was not common practice in Thailand until 1913. With no father, Sangwan decided to take the surname of Lee Talabhat, who, at that time, was in the service of Prince Mahidol Adulyadej.

Sangwan the student nurse

Sangwan Talabhat left Bangkok in 1917 with around twenty other Thai students. A year later, they joined eight more Thai students and travelled to Boston, Massachusetts. Prince Mahidol was waiting at the Boston railway station to meet them although, at the time, Sangwan had no idea who he was, or even that her very presence had already made a favourable impression on the young prince.

Romance ensued, and in a private ceremony in 1919 Prince Mahidol Adulyadej the Prince of Songkla took Sangwan Talabhat to be his wife. After their marriage, Sangwan became known as Mom Sangwan Mahidol na Ayudhya, but in Boston they were simply Mr and Mrs Mahidol Songkla living in a two-bedroom apartment, getting on with their studies. Apart from pursuing their studies, they would also cook and serve meals to other Thai students: Mrs Mahidol Songkla cooked and her husband washed the dishes.

Theirs was a simple life, but tragedy lurked around the corner. The Prince graduated with honours from Harvard Medical School but by then his health had deteriorated; immediately after his finals Prince Mahidol suffered acute appendicitis that required urgent surgery.



Prince Mahidol with future wife Sangwan (left) and Sangwan's school friend Ubol



Sangwan Talabhat (3rd left) with friends in Berkeley, California

Accession to the throne

Sadly, Prince Mahidol passed away in 1929 when Mom Sangwan Mahidol na Ayudhya was just twenty-nine years old with three young children to care for. Her daughter was six, and her two sons four years, and one-year-and-nine months. Princess Galyani Vadhana was the first born. The boys, Prince Ananda Mahidol and Prince Bhumibol Adulyadej, would both accede to the throne of Thailand as King Ananda Mahidol, Rama VIII, and King Bhumibol Adulyadej, Rama IX, respectively. As soon as they were old enough, the children started school in Thailand.

The coup d'état in 1932 ended absolute monarchy in Thailand and raised the possibility that King Prajadhipok (Rama VII) might abdicate. Concerned about Prince Ananda Mahidol's safety as a likely heir to the throne, his grandmother Queen Savang Vadhana accepted advice that the Mahidol family should move to Lausanne, Switzerland. It was a decision that Mom Sangwan approved of because of its mild climate, beautiful scenery and hospitable people. They left in 1933 and Prince Ananda Mahidol spent most of his youth there.

It was in 1934 just one year after Mom Sangwan and her three children arrived in Switzerland they learnt that King Prajadhipok had abdicated. As anticipated the next in line to the throne was her son, His Royal Highness Prince Ananda Mahidol, who was declared the eighth monarch of the Chakri Dynasty. He was nine years old. Until the young prince came of age, parliament appointed two Regents to oversee affairs of state.

After acceding to the throne, the young King Ananda Mahidol returned to Thailand at which time Mom Sangwan was elevated to the ranks of royalty with the title "Her Royal Highness".

Passport photograph of HRH and her children



World War II

When war erupted in Europe in 1939, the Mahidol family, just like everyone else, felt the repercussions. Along with other families in Switzerland they relied upon ration coupons for food and other daily necessities. The young king travelled to and from school by bicycle. The Princess Mother supplemented food stocks by making jams from fruits from her own garden. Though times were harsh, she never neglected the Thai students who came round for meals on Saturdays, even extending her largesse by lending (or giving) them money to help them if their funds were late arriving from Thailand. The family lived in Switzerland until all the children graduated; they then prepared to return to Thailand.



Family snapshot taken in Switzerland

Back in Thailand

A throng of Thai people gazed in awe, admiration and great respect as the Princess Mother posed for photographs with her two sons upon their return to Thailand in 1945 at the end of the war. Now forty-five years old, Her Royal Highness had successfully directed the formative years of her children and was now delivering them to the Thai people as responsible and intelligent adults. King Ananda Mahidol was ready to take on the huge burden placed on his shoulders and, as he had grown up in Europe, there was much to learn about his own country and its culture; questions the Princess Mother was prepared for and able to answer.



Young King Ananda (Rama VIII) meeting the people of Thailand for the first time

Prince Bhumibol Adulyadej's accession to the throne

Planning to return to Switzerland to continue his studies, King Ananda Mahidol was requested by the Royal Thai government to postpone his date of return in order to present the new Constitution to the nation in May 1946 and to open Parliament on June 1. The king rescheduled his return to Switzerland for June 13, but three days before the date an unforeseen calamity befell the nation when His Majesty King Ananda Mahidol (Rama VIII) met with a tragic and untimely death. On that same day, Prince Bhumibol Adulyadej, the Princess Mother's second son, acceded to the throne as King Bhumibol Adulyadej (Rama IX) of Thailand, the ninth monarch of the Chakri Dynasty.



Coronation of HM King Bhumibol Adulyadej (Rama IX), May 5, 1950

Return to Switzerland

The Princess Mother accompanied the new king back to Switzerland to enable His Majesty to resume his studies at the University of Lausanne, while the Princess Mother resumed her role as “housekeeper” of the Villa Vadhana residence.

Preferring to undertake routine tasks herself, the Princess Mother would drive her own car on shopping rounds. Apart from attending lectures at the University of Lausanne on topics that interested her, she spent much time in her garden cultivating flower beds, pruning bushes and sweeping up fallen leaves. Even on trips around the countryside of Switzerland with the young King Bhumibol, the Princess Mother would stop by the road to pick wild flowers to take home. It was this innate love of nature and respect for the environment that began to influence Her Royal Highness' interest in conservation.

Villa Vadhana, Lausanne, Switzerland



The Princess Mother picked wild flowers to make cards and bookmarks

The Princess Mother's passion for flowers, her sensitivity and concern for the world around her, dominated her life as a youth and into later years. It was more than just an artistic or visual interest; the Princess Mother was driven by a desire to nurture seedlings and young plants into full bloom with the same enthusiasm and attention to detail that she applied in her role as a royal mother.

Collecting wild flowers was not simply for pleasure and decorative purposes: As with most of the Princess Mother's other activities, it became an educational process, not only for her own edification but for the tutoring of others. Meticulously, she arranged the pressed flowers into an album, indicating the names in both French and Latin, also documenting the location where they were picked, the altitude and date.

Serving the Kingdom of Thailand

The Princess Mother served Thailand throughout her long life not only by providing full support to her family, but also by engaging in activities of great social concern to her as a caring and compassionate mother.

Her Royal Highness travelled between Switzerland and Thailand from 1952 to 1963 to attend significant functions and events, such as the births of her grandchildren. She would stay for one or two months at a time or for extended periods when the occasion demanded. One such occasion was when Their Majesties the King and Queen undertook a state visit to fourteen European countries and the United States in 1960. At that time, the Princess Mother remained in Thailand for six months acting as Regent in Their Majesties' absence.

It was in the early Sixties and during a trip to northern Thailand in 1964 in particular that the Princess Mother had an enlightening experience that prompted her to introduce changes to her normal routine. Her Royal Highness was invited by His Majesty the King to visit Bhubing Palace in the northern province of Chiang Mai. During long walks through the woods behind the palace (replicating her practice of taking long treks while in Switzerland) the Princess Mother was able to enjoy the flora and fauna of the area, stopping to talk to people in small villages along the way. It was clear that abject poverty, a lack of schools, inadequate health services, and personnel, were critical social challenges facing the poor villagers. Even the border patrol police, who acted as guards for the Princess Mother, were poorly paid.



The precariously unstable socioeconomic situation the Princess Mother encountered in rural areas prompted repeat visits to the remoter parts of the Kingdom. Extremely fit for a sixty-four-year-old, the Princess Mother made a point, among other things, to visit each patrol station on her travels to lend moral support to the police and soldiers.

These visits to outlying areas of northern Thailand were the beginnings of what would become a series of humanitarian projects aimed at alleviating the hardship suffered by marginalised people. Her Royal Highness was determined to improve their quality of life and the way forward would be through education, health care and respect for the environment.



Visiting the Border Patrol Police accompanied by Princess Galyani

Social welfare initiatives

Social welfare projects initiated by the Princess Mother and still in vogue today serve to unify people living in remote areas. Her Royal Highness always approached each and every challenge from a humanitarian standpoint and out of a sense of duty – in much the same way she cared for her three children when she was still quite young with no husband to support her.

The Princess Mother had shown by example that Thai housewives could contribute to society by making good use of their time. In 1932, after the children started school, Her Royal Highness started an American-style “sewing circle”, inviting close acquaintances to join the group. They started by making their own clothes but later they made clothes for poor children in hospitals.

Soon it became a standard procedure for the Princess Mother to use her own funds to buy necessities for poor villagers during her increasingly frequent trips to rural parts of Thailand. The gifts consisted of shirts, towels, multipurpose pha khao ma cloth, stationery for teachers and schoolchildren, school uniforms, sarongs, needles and thread, medicines, tinned food and dried foodstuffs. Small children would receive toys applicable to their age group. Personal funds were also used for setting up foundations, notably the Border Patrol Police Support Foundation, and the New Life Foundation for patients who had recovered from leprosy or mental illness. The Princess Mother’s capacity for altruism appeared to be boundless.



While doctors examined the sick, the Princess Mother handed out toys and uniforms



Schools were provided for children living in remote areas

Education and scholarships

Her Royal Highness' love for education fuelled a desire to encourage her own children, and those of people she met during her travels, to further their studies to the best of their abilities. Towards this goal, the Princess Mother offered support wherever and whenever she could, particularly in the more inaccessible parts of the country beyond easy reach of the central government.

Formerly a scholarship student herself, the Princess Mother provided scholarships for others as far back as 1920, not long after her marriage to Prince Mahidol. The Princess Mother's own studies, under the direction of Prince Mahidol, had included algebra, English, Latin and French, as well as her courses in nursing and public health, and tutorials in psychology, cooking and nutrition.

As a well-educated and well-rounded individual, and through the influence of her royal husband, the Princess Mother remained conscious of her responsibility to return to Thailand to help the nation - a sense of purpose she instilled into the hearts and minds of her three children from the time they were very young.

The importance the Princess Mother attached to education could not be overemphasised. Frequent trips to out-of-the-way parts of the kingdom where she learnt of extreme poverty among villagers, especially hilltribes, prompted Her Royal Highness to initiate the Border Patrol Police School project. A school was established by the Border Patrol Police Region 5 in the Mae Rim District of Chiang Mai Province that provided education for children in this remote region. The result was hilltribe children had a chance to learn the Thai language and culture and become inculcated with a sense of being Thai.



The Princess Mother often used her own funds to help poor villagers

This concept aligned with the Princess Mother's belief that education was fundamental to improve human resources, a vital tool for any form of development particularly in the remoter parts of Thailand. With this in mind, she decided in 1964 to take the school under her royal patronage, at the same time donating funds to the Border Patrol Police to set up similar schools in remote areas. The idea was embraced by Thailand's private sector and companies contributed funding towards new schools subsequently named after donors. In time, there were 185 schools with power classrooms and appropriate residential quarters for teachers. The Princess Mother opened each one of these schools donating symbolic items to promote a sense of Thai identity, including a Buddha image to symbolise religion, a portrait of the King or Queen as an emblem of monarchy, and a flag to represent the nation. Each school had a radio link to stay abreast of news, and a map of Thailand to give students a sense of belonging irrespective of where they were located in the country.

In addition to providing scholarships, the Princess Mother worked untiringly to further nursing in Thailand. As founder and board member of The Nurses' Association of Thailand, she used her personal funds in 1960 to stage the first national nursing convention ever held in the country. Later, hospital buildings and nursing schools were built under the royal patronage of Her Royal Highness.



Public health improvements essential for development

Of prime concern to the Princess Mother was the health and wellbeing of the people. If they were able to enjoy good health, she reasoned, they would be able to earn a living and contribute to the development of the country. This view echoed the philosophy espoused by her late husband Prince Mahidol Adulyadej who had injected financial support to further a personal goal to improve public health in Thailand.

The sad passing of Prince Mahidol, a great personal tragedy to Her Royal Highness, did not prevent the Princess Mother from remaining focused and engaged with plans to improve the nation's public health. Her Royal Highness knew from Prince Mahidol's dedication to medicine and public health that such would have been his desire. Accordingly, she provided medical students with scholarships so their studies were not interrupted. And on their return to work, she supplemented the students' salaries if they were lower than the set rate. The Princess Mother went even further by establishing a revolving fund of 500,000 baht for Chulalongkorn University over twenty-five years; interest from the investment to be used to send students overseas for postgraduate studies. When the twenty-five years were up, the fund in its entirety was transferred to the Faculty of Medicine at Siriraj Hospital.

Conscious at all times of the need to help her country, the Princess Mother, alert to the needs of Thai people, remembered to bring back from Europe the drug PAS (for treating tuberculosis) when she accompanied her elder son, King Ananda Mahidol back to Thailand in 1945.



Air transport was often the only way to access remote areas



Concern for the poor and marginalised people kept HRH going despite her advancing age

Volunteer medical team

During the early 1960s, the Princess Mother regarded trips to remote areas to visit villages and army personnel as a part of her routine. Although saddened by the sight of people plagued with health problems, the Princess Mother remained determined to tackle them. In remote areas where medical facilities were inadequate, normally treatable diseases such as gastrointestinal infections, tape worms, skin diseases and even malaria, often resulted in death.

To address the problem at source, the Princess Mother in 1969 established the first medical volunteer mobile unit in Chiang Mai Province. Volunteer doctors, dentists, pharmacists, nurses and health officers contributed their time and service skills at weekends to respond to calls for help. They would travel by car or helicopter to treat the sick and offer consultation services free-of-charge. The venture was not cost-free but it was subsidised by the Princess Mother who often accompanied the medical response team to help fill out prescriptions and provide advice to the sick. Those patients deemed to be critically ill were sent to local hospitals.

As the service became established, the Princess Mother (at first as an experiment) used radio consultation between hospital doctors and patients waiting in health centres in remote areas similar to the system adopted by the Royal Flying Doctor Service of Australia. The experiment was a huge success: within a few years 446 radio centres had been established in twenty-five Thai provinces. Over 1,000,000 patients benefited from this service whose operations centre was at Sra Pathum Palace where Her Royal Highness and Prince Mahidol were married, and where Prince Mahidol would spend his last days.

Preserving the environment

In her early life, the Princess Mother exhibited an innate interest in the wonders of nature. During time spent in Switzerland, she enjoyed skiing the alpine slopes during winter. But summer would be spent trekking around the hillsides, gathering and identifying wild flowers to decorate the house.

In 1964, aged sixty-four, the Princess Mother hiked to the top of Doi Inthanon, Thailand's highest peak located in the northern province of Chiang Mai. On local walks she was usually accompanied by Border Patrol Police and her personal physicians. Now, the Princess Mother wanted to extend her walks from the vicinity of Bhubing Palace where she was staying, and Doi Inthanon was visible from the palace windows. Conquering it became a growing priority.

In the early Sixties, there were no access roads leading to the peak. The Princess Mother had to spend two nights camping on the mountain: the first night prior to the ascent at Ban Pha Mon, and the following night at Pang Somdet. Her Royal Highness found herself surrounded by a large crowd of hilltribe villagers. It was a welcome sight, but the general state of their health and a lack of access to medical care was cause for great concern.

When the Princess Mother returned by helicopter to the same place a year later she brought with her two doctors. Subsequent visits to these remote locations earned her the title "Mae Fah Luang" among hilltribes, meaning Royal Mother from the sky in reference to her helicopter descent from the skies with doctors, nurses, medical equipment, food and clothing.

After multiple visits to the hilltribes, the Princess Mother saw that the slash-and-burn techniques they used to clear the land for cultivation had hastened the destruction of the area's watershed forests. Moving from place to place, the villagers had left behind a trail of destruction and barren patches on the hillsides.

Her Royal Highness could see that addressing environmental degradation and tackling education and health care challenges were interlinked. From this assessment and with advice from others, she initiated the Doi Tung Development Project.

On local walks, the Princess Mother was often accompanied by Border Patrol Police and her personal physicians



Picking wild flowers, a great passion of the Princess Mother





Mae Fah Luang Foundation

Although distressed at the personal plight of hilltribe villagers, the Princess Mother found through frequent visits to remote areas that some were able craftsmen. With the right kind of help, she felt they could make their own living and become responsible members in their own communities.

In 1972, with 100,000 baht of seed money from her personal funds, the late Princess Mother established the Thai Hilltribe Products Promotion Foundation. It was a successful initiative; ethnic minorities were given help to package and market their handicrafts and these soon proved popular overseas as well as in Thailand.

Thirteen years later, the foundation's activities were expanded to encompass full-cycle development ranging from economic to social and environmental aspects. It also helped preserve Lan Na arts and culture. With the foundation's new role came the new name "Mae Fah Luang Foundation under the Royal Patronage of HRH Princess Srinagarindra". During a visit to Doi Tung in 1987, Her Royal Highness recognised the need for forests to be rehabilitated in parallel with the development of people's quality of life. It was then that Her Royal Highness accepted Mom Rajawongse (MR) Disnadda Diskul's proposal to build a house on Doi Tung, but only if the Doi Tung Development Project was also built there. Under the scope of the project Her Royal Highness was able to supervise the progress of various programmes concerning health and education development for people living in this vast area.

MR Disnadda Diskul, who is Secretary General of the Mae Fah Luang Foundation said “The Princess Mother may have been small in stature, but she had a huge heart and was a most compassionate lady who led by example.” By way of illustration, the Secretary General related an incident when the Princess Mother was walking towards a man smoking a cigarette. “The man threw it on to the ground and stubbed it out with his foot. Without a word, the Princess Mother walked over, picked up the cigarette butt, and later deposited it in a rubbish bin.”

The Secretary General explained how the Princess Mother had raised her three children to understand the value of money. “The Princess Mother believed you should not receive money for doing nothing; you had to earn it.” MR Disnadda related an occasion when the Princess Mother asked her son (His Majesty King Bhumibol) how he came to obtain money from his nanny. “His Majesty was able to inform his mother that he had earned it repairing a sewing machine!”

Doi Tung Royal Villa with kalae roof decoration typifying northern-style architecture



Doi Tung Royal Villa, residence of the Princess Mother

The Princess Mother had a huge appetite for education. “She was always searching for knowledge...eager to learn, and became even more scholarly when she met up with Prince Mahidol,” MR Disnadda recalled.

The Princess Mother adhered to the same principles throughout her entire life, irrespective of where she directed her efforts. “With regard to driving the Doi Tung project,” MR Disnadda said, “I would say that the Princess Mother was the jockey, and I was the horse! It was a real privilege to gain experience from knowing her...to witness her compassion.”

All the projects, the Secretary General explained, were about helping people. “Just as His Majesty did not care for populist policies, the Princess Mother did not believe in giving away money to solve problems. His Majesty’s philosophy is to give people the weapons – knowledge, education – to fight against poverty. Everything the King has done shows that this philosophy works; the whole approach is to help others to help themselves.”

Asked how the Doi Tung project initiated by the Princess Mother differed from the Royal Project initiated by His Majesty the King, the Secretary General said there were no major differences. “The Princess Mother studied His Majesty’s project in Chiang Mai,” explained MR Disnadda, “then she asked me to study His Majesty’s experimental projects at Chitralada Villa in Bangkok.”



In 1987 the Lord Chamberlain showed MR Disnadda to every project at Chitralada Villa. “When I reported back to the Princess Mother on what I’d learnt, she advised me to start cultivating mushrooms, mulberry trees for sa paper...and tissue culture. Her Royal Highness said ‘we can make money with these!’”

In terms of initiating projects, the Secretary General said the Princess Mother had learnt from her son, His Majesty the King. MR Disnadda noted that later on, the Princess Mother asked her daughter, Princess Galyani, to go to the Huai Hong Khrai Royal Development Study Centre in Thailand’s northern province of Chiang Mai to see how His Majesty’s projects were developed.

“This was the first stage...the beginning,” MR Disnadda said. “The second part was to understand the co-existence of man and nature. Fortunately for all of us, the Princess Mother was so practical and took a simple and logical approach to all matters.”

Asked where Her Royal Highness drew her inspiration, the Secretary General said she was encouraged by her husband the late Prince Mahidol. “While he was studying to be a doctor, the Prince became aware that to be a good doctor he had to love to help people...to be caring and compassionate...and he was. In my view this led to the Princess Mother drawing much of her inspiration from her husband.

“At the foundation, we try to follow the Princess Mother’s example: As we go about our business, nobody asks ‘what’s in it for me?’” MR Disnadda said. “The self-contentment and satisfaction we draw from doing this is something money can’t buy!”

The Mae Fah Luang Foundation learnt from The Royal Project initiated by HM the King





The DTDP covers a land area of 15,000 hectares

Doi Tung Development Project

Asked if the main objective of the Doi Tung Development Project was reforestation, MR Disnadda explained reforestation was simply the “vehicle” to transport change. Reforestation had to be undertaken because the land was denuded. “You can see from recent events in Thailand that people talk of the urgent need to address inequality. But inequality is a symptom and comes last. First we have to address the causes: poverty and lack of opportunity. Drugs [in the context of Doi Tung] were not and are not the root cause; poverty drove people to opium cultivation; people will do anything to survive.”

The Doi Tung Development Project started in 1988 as a Sustainable Alternative Livelihood Development (SALD) project to develop people living in highland areas to enjoy a better quality of life and to enable them to help themselves through self-development. SALD also aimed to conserve and develop natural resources and the environment, as well as the culture of local people so that they mature into responsible citizens. The principles and guidelines for implementing the project have become a model for other socio-geographical areas.



The highest elevation point of the Doi Tung Development Project is 1,509 metres at Doi Chang Moop.

“At one time Doi Chang Moop was the best place in the world to grow opium,” the Secretary General said, recalling the start of the Project. “The hillsides, you see, face northeast away from the hot afternoon sun, so it was good for growing opium.”

MR Disnadda explained that Doi Chang Moop, also part of the project, was one of the Princess Mother’s favourite places. “Her Royal Highness loved red rhododendrons, so we got a hundred from Myanmar to plant on Doi Chang Moop.” The Secretary General said they also brought in 6,427 more from Zu Mao, China in 2004 “...by boat down the Mekong River and up the mountainside in 35 ten-wheeler trucks. This was in 1993. And when the rhododendrons were in full bloom Princess Sirindhorn took a photograph of the hillside for the Princess Mother. She kept it next to her bed always.”

The SALD model, mirroring the Princess Mother’s development principles, has evolved over more than twenty five years. Its purpose is to empower people irrespective of gender, religion, ethnicity or political orientation, to help themselves and others and, eventually, to continue to develop unaided. The aim is to enable people to live with dignity and in harmony with nature as good, self-sufficient and capable members of society.

Once a secluded place in the north of Thailand bordering Myanmar at the heart of the infamous Golden Triangle, the Doi Tung Development Project encompasses approximately 93,515 rai (37,406 acres) of land. There are 29 villages with about 11,000 people in this area.





Jobs and skills training are provided on site

Complex problems had to be addressed in the early days: the watershed became denuded by overzealous slash-and-burn cultivation, exacerbated by opium poppy cultivation on a commercial scale, as well as reallocating cultivation. Most of the six ethnic groups living in the area did not hold Thai citizenship, so received little attention from government officials. There were armed groups claiming ownership of the area that made it even more difficult for government officials to assist the local people. These were massive challenges to overcome, and would form part of a thirty-year development programme broken down into three separate phases.

Phase I “Bridging the Gap between Doi Tung and the Outside World” was carried out between 1988 and 1993. Basic infrastructure was developed; opium growers were paid daily wages to become forestry workers. The fundamental necessities of life were provided; jobs and skills training initiated. Economic forests were planted and nurtured to create short, medium and long-term economic benefits for the local residents.

In Phase II “Livelihood Development”, carried out between 1994 and 2002, the focus was on income generation, a first step towards sustainability. Economically viable local resources and plants were identified and the foundation introduced a value-added approach to optimise the value of local resources.



The project has four business units: foodstuffs, handicrafts, tourism and horticulture

The third phase “Sustainability and Exit” will continue until 2017 by which time the four business units (foods, handicrafts, tourism and agriculture) will be strengthened to be profitable as well as self-sustaining.

The Mae Fah Luang Foundation (MFLF) has been financially self-sustained since 2000 with income from its four businesses paying for the salaries and wages for 1,600 employees as well as supporting social and development activities in the project area.

To date, the Mae Fah Luang Foundation has undertaken development projects in a number of areas. The foundation’s overriding objectives are to improve the quality of life of local people and enable human beings and forested areas to coexist in harmony. The preservation of culture and arts of hilltribes and northern people is another of the foundation’s objectives in response to the wishes of Her Royal Highness Princess Srinagarindra.

The project is a holistic and SALD initiative of the Princess Mother





The reforestation project

In 1988, around 105,000 rai (42,000 acres) of land in Mae Chan District (part of Mae Chan district now belongs to Mae Fah Luang district), and Mae Sai district in Chiang Rai province, became a prime area for a reforestation and a sustainable development programme to improve the quality of life of local villagers. The approach taken by Her Royal Highness was divided into three parts: economic development, social development, and environmental development, with people at the core.

The energetic Princess Mother would play an active role in the early days of the Doi Tung Development Project nurturing the saplings and then replanting denuded forest, later to benefit from additional support from the Royal Thai Government and the country's private sector. Soon, experimental plots were set out to test temperate crops such as Arabica coffee beans from Brazil and Costa Rica, macadamia nuts and chestnuts. Later, and to the present day, new plant-nursery technology is constantly introduced to propagate such plants as asparagus, bananas, orchids and strawberries. After successful trials, the local villagers are trained in propagation and cultivation and guided towards a sustained lifestyle and increased incomes.

Doi Tung underwent great change: Local villagers were encouraged to grow a variety of cash crops in the forest including the paper mulberry plant as it is an indigenous species used to produce paper and other products.

Land previously used to cultivate opium poppies today has been used to grow fruits and vegetables



The reforestation project was launched in 1990 on the anniversary of Her Royal Highness's 90th birthday. Using public sector contributions, ninety-nine plots, comprising sixteen hectares on Doi Tung more than 700 metres above sea level were planted with nearly 1,000,000 seedlings of varieties of pine and mountain ebony trees. Teak was planted below that level. In time, the project expanded to four neighbouring hills that were selected to be watershed forests and to provide an income for local people living in the area. It was a good beginning to be followed in time by more innovative ideas supporting human, economic and environmental development.

Sixteen hectares reforested with pine, mountain ebony and teak trees



Drug Rehabilitation Centre

Two years later, in February 1992, the Drug Rehabilitation Centre was established in the Mae Sai District of Chiang Rai Province. The centre offered services to 469 drug addicts from twenty-seven villages. More were directed to the centre whenever a village committee decided they would not allow addicts to reside there unless they agreed to undergo treatment. It was a successful ploy. Treatment and rehabilitation normally takes 1,000 days, and the centre has a success rate close to one hundred percent. The aim is to put patients through physical and mental therapy, including vocational training, so they can become self-sufficient once they are pronounced fit and well.

Paper from mulberry bark

The Mae Fah Luang Foundation in association with the Department of Agricultural Extension began to offer paper-mulberry seedlings to villagers for cultivation purposes in forested areas to help generate employment and income and produce raw material for future use in sa paper factories. The MFLF bought-back paper-mulberry bark at a guaranteed price to encourage villagers to grow the trees. To become pliable, paper mulberry bark has first to be dried, boiled and then rolled on to racks to dry as sa paper. Hilltribe villagers, with cooperation from the Doi Tung Handicraft Promotion Centre of the Ministry of Industry, are quite adept at producing fine handicrafts from sa paper such as kites, flowers, greeting cards, dolls, drawing paper and notebooks which they sell to tourists as souvenirs. The scheme drew out the best in hilltribe villagers as artisans (a trait detected years before by the Princess Mother) allowing them to forge a living using their own creative skills.



Sa paper is a multi-use product from mulberry bark





Mae Fah Luang Garden: winner of the PATA Award for Tourism Site development 1993



Similar to HM the King's Royal Project, vetiver grass was used at Doi Tung to stabilise hillsides

Vetiver Grass Research and Development Centre at Huai Hong Khrai

A significant obstacle to overcome in the early days of the Doi Tung Development Project was related to soil erosion and landslides, some of which were caused by accelerated road construction. Something had to be done to stabilise the soil and contain water runoff, which was draining away soil nutrients crucial for cultivating crops.

In 1992, His Majesty the King learnt of this problem during a visit to Her Royal Highness Princess Srinagarindra, the Princess Mother. His Majesty delivered a document to Her Royal Highness about vetiver grass who then initiated vetiver grass cultivation on a trial basis to ease the problem of soil erosion in the Doi Tung Development Project.

As the King's study groups had discovered, vetiver grass is a highly versatile plant. If planted and encouraged to grow on the contours of mountain slopes, vetiver traps sediments and prevent soil nutrients from being washed into the valleys and rivers below. Its wide-ranging properties led to it being described as "miracle grass" by farmers and the scientific community.

That same year, cooperation was sought from several government entities that undertook to collect vetiver clones from a number of provinces for multiplication in an area of eight hectares at Huai Hong Khrai at the foot of Doi Tung. Eight months later, 10,000 vetiver plants had proliferated to an astonishing total of 21,000,000.

Subsequently, the Huai Hong Khrai Royal Development Study Centre was established in Chiang Mai Province to cultivate vetiver multiplication plots in paddy fields where more suckers could be produced than when grown in compact, plastic bags. It was also discovered that soybean planted in vetiver fields acts as a natural fertilizer for vetiver. Today, this "miracle grass" is propagated for domestic use and also for sale overseas.

Domestic and international tourism

After the completion of Doi Tung Royal Villa in November 1988 Her Royal Highness travelled there to live and work. Her Royal Highness said; “This is my home!” It was indeed a true and accurate statement as other locations occupied by the Princess Mother were officially classed as “royal residences”. Doi Tung proved to be the Princess Mother’s first and, sadly, last home in Thailand.

The transformation that took place on Doi Tung under the Princess Mother’s stewardship in the space of one decade was nothing short of miraculous. Hillsides were replenished with dense, watershed forests, commercial forested areas and botanical gardens. At first the site was little more than an experimental agricultural project to inspire local people to help replant deforested areas and regenerate the environment. Today, Doi Tung is a thriving development project and a leading tourism destination in Thailand.

Over time, and with patience and a sense of purpose, the Doi Tung Development Project transformed denuded forest on Doi Tung Mountain, and adjacent locations, into an “economic forest” with watershed areas. Local, hilltribe villagers had opportunities to improve their living conditions by making use of the “economic forest” which created many occupations. Today, they are proud of their success.

The Princess Mother’s approach to Doi Tung followed much of His Majesty the King’s work in the Royal Project at Chiang Mai. One significant difference was that at Doi Tung local hilltribe villagers were hired (and paid) to plant trees and crops in the initial stage, whereas a grassroots agreement had first to be established under the Royal Project after patiently demonstrating to sceptical community leaders how their hillsides could be improved through crop substitution.

Visitors from all over Thailand and from overseas can not only spend time touring and inspecting Doi Tung they can stay overnight in comfortable accommodation provided either at Doi Tung Lodge or Greater Mekong Lodge. There is much to see, absorb and understand about the creative work of the late Princess Mother, which cannot be achieved in a short space of time.

Doi Tung Royal Villa surrounded by temperate blooms





The royal villa surrounded by gardens





Doi Tung Lodge

Doi Tung Lodge

During the earlier days of the Doi Tung Development Project, Her Royal Highness spent months at a time at Doi Tung Royal Villa. Its location, in an area that once served as the office and accommodation of the 31st Watershed Conservation Unit of the Royal Forest Department, was perfect for the Princess Mother to oversee the operation of the project.

From time to time, His Majesty the King and other members of the royal family would pay her a visit. A new villa was built in the area to accommodate the royal entourage and employees of the project but, unfortunately, it was only completed in 1997, after the Princess Mother had passed away. Subsequently, it was turned into lodgings for tourists with the gracious permission of Her Royal Highness Princess Maha Chakri Sirindhorn who was assigned by His Majesty the King to become chairperson of the Mae Fah Luang Foundation after the passing of the Princess

Mother. Doi Tung Lodge has become one of a number of tourism services offered by the Doi Tung Development Project. Proceeds from the lodge help to pay for its maintenance and other amenities.

In keeping with the vision of the late Princess Mother, Doi Tung Lodge is another source of employment for local people who can learn the functions of tourism. For example they learn how to welcome guests at the reception area, provide services such as food and beverage and assume management responsibilities. In effect, the lodge offers local folk alternative work prospects that they would otherwise have to find by leaving their birthplace. Instead, they are able to stay in their own locality, earning a good income, and enjoying stable employment.





The lodge is a tourist attraction with spectacular views over the Mekong River

Greater Mekong Lodge

Similar to Doi Tung Lodge, Greater Mekong Lodge offers accommodation and other facilities for visiting tourists from Thailand and overseas. Located around ten kilometres northwest of Chiang Saen in Chiang Rai Province, the lodge offers stunning views over the Mekong River. Also staffed by local people, many from Doi Tung, the lodge provides an opportunity for people to earn a stable income without having to seek work elsewhere.

Traditional food served in restaurants

Restaurants supporting the Doi Tung Development Project are situated on Doi Tung Mountain and at the Greater Mekong Lodge. Both have opted to use fresh, toxin-free vegetables supplied by the project along with some from local farms in the area. Again, this offers local people alternative sources of employment and income. Traditional northern Thailand dishes with ethnic specialities are included in the menus which are constantly updated by locally-recruited chefs. Service personnel, including people from different ethnic minorities, take great pride in their work and are always ready to welcome domestic and international visitors.



Ethnic specialities are served at Greater Mekong Lodge



Mae Fah Luang Garden

The garden is located on land originally the site of the Akha hilltribe village of Pa Kluay, which was once an important route for opium caravans trafficking in heroin and weapons. The Akha lived in a dense settlement in a deep gorge with little room for expansion to facilitate hygiene needs, trash or wastewater management. Following a request from the Mae Fah Luang Foundation, villagers agreed to vacate their village for a new site just 500 metres away. The new site had expansion opportunities, running water, electricity and a paved road to the village.

In accordance with the Princess Mother's desire to offer Thai people an opportunity to enjoy a temperate flower garden (knowing that some Thais may have never travelled outside of Thailand) four hectares of the vacated land were turned into a garden of temperate flowers.

At the centre of the garden a sculpture entitled "Continuity" by the late Misiem Yip-In-Soi draws attention to the fact that continuity is at the centre of success in any endeavour. The garden is hugely successful partly because the decorative flowers there are grown and nurtured by local villagers. Mae Fah Luang Garden brings in a substantial income to the area both in job opportunities and in terms of income from tourists. Its success was acknowledged in 1993 when the Pacific Asia Tourism Association (PATA) named Mae Fah Luang Garden the winner of the PATA Award for Tourism Site Development.



"Continuity": sculpture at the centre of Mae Fah Luang Garden



Temperate flowers in bloom at Mae Fah Luang Garden



Preserving Lan Na culture in northern Thailand

Mae Fah Luang Art & Cultural Park

Originally known as Rai Mae Fah Luang, this was the location of the office of the Thai Hill Tribe Products Promotion Foundation where products were bought from hilltribe villagers. By purchasing and marketing handicrafts on behalf of ethnic minorities, the Thai Hill Crafts Foundation helped preserve the hilltribes' traditional skills and support their livelihoods.

Her Royal Highness went even further by establishing the Youth Leadership Project, and Rai Mae Fah Luang became a “home” to hundreds of youths from remote areas who wanted to continue their studies at a higher level in the city as there was no school in the area at that time. The young people were from the immediate vicinity of Doi Tung and neighbouring areas such as Chiang Mai and Payao Provinces.

In addition to classroom education, Her Royal Highness believed that students should acquire knowledge from personal experience to learn how to develop social skills and live as a part of a community. With shared responsibilities they learnt to care for younger folk; they also learnt about time management; worked in shifts to clean up their lodgings; farmed, gardened, and tended vegetable plots. The goal was to help students develop and grow into dedicated, hardworking, ethical leaders in their communities.

Students living in villages in the area had easier access to schools once the Doi Tung Development Project became established, effectively supplanting the role of Rai Mae Fah Luang as an educational institute for ethnic minority youths.

The transition to the name “Mae Fah Luang” (Royal Mother from the sky) came from hilltribes out of respect for the Princess Mother in reference to her “descent from the skies”, by helicopter, with doctors, nurses, medical equipment, food and clothing for the villagers – a service she often performed. It was little wonder, therefore, that the Princess Mother was held in such high esteem by ethnic minorities in the hills of Chiang Rai Province.

After years of dedicated development, the Mae Fah Luang Art and Cultural Park today offers the largest collection of art from Lan Na culture or Tai culture (minorities in northern Thailand, Yunnan in China’s southwestern region, eastern Myanmar or the Shan States, northwestern Vietnam and western Lao PDR).

The park, which welcomes tourists from around Thailand and all over the world, not only features artefacts but also exquisite Lan Na architecture. A fine example is Haw Kham (Golden Pavilion) built by the people of Chiang Rai Province and presented as a gift to HRH the Princess Mother to celebrate her 84th birthday. Haw Kaew is another attraction that features a permanent exhibition on teakwood along with year-round, revolving exhibitions and a botanical collection of indigenous plants from the northern region of Thailand.



Sculpture by Misiem Yip-In-Soi of HRH the Princess Mother in the uniform of a colonel



Haw Kham is a fine example of Lan Na architecture

Doi Tung Lifestyle Shops

A variety of products skilfully crafted by ethnic minorities working in the Doi Tung Development Project are sold in Doi Tung Lifestyle Shops in various parts of the country. Many of these products are unique to the project and include, for example, hand-woven apparel, accessories and home décor items; hand-tufted carpets, ceramics ware and mulberry (sa) paper products. Many countries recognise the Doi Tung Development Project for its success in following sustainable alternative livelihood development (SALD) to combat illicit crop cultivation. In recognition of its success, Doi Tung is permitted by the United Nations Office on Drugs and Crime (UNODC) to use the “UNODC” seal of approval on all its products.

Doi Tung Lifestyle Shops are expanding around the country and can be found today at the international airports in Bangkok, Chiang Mai and Chiang Rai, and in well-known markets including Bon Marché and J.J. Market in Bangkok and Hua Hin Market. A cross-section of Doi Tung products include home ware (carpets, floor coverings and ceramics); fashion (ready-to-wear clothing and accessories); mulberry paper products (sa boxes, sa notebooks and sa paper); coffee and macadamia nut products; plants and orchids (including pot plants and cut flowers) and landscape design services for special occasions such as company anniversaries.



Doi Tung products include homeware, fashion wear, sa paper, coffee, nuts, pot plants and flowers



High-quality Arabica coffee is available in supermarkets and at Café Doi Tung outlets in Thailand

Café Doi Tung

The project is particularly proud of its coffee, which, for local people, has been a successful replacement crop for opium poppy cultivation. Café Doi Tung outlets use only high-quality Arabica coffee beans harvested from Doi Tung hillsides 800 metres

above sea level. The coffee beans are handpicked and graded before being roasted and ground. It is a meticulous process that lends every cup of coffee its individual taste.

Macadamia nuts are another cash crop that has replaced opium poppy cultivation. The nuts are roasted and packaged in various flavours and sold through Café Doi Tung outlets and general shops.



This Lan Na-style flag procession contrasts with the cultivated hillsides of Doi Tung





Domestic assistance and international cooperation

Experience gathered by the project management in transforming former opium fields on the slopes of Doi Tung into areas where people can live harmoniously with the forest on a sustainable basis was communicated by Doi Tung Development Project Secretary General MR Disnadda Diskul to attendees of the 1st World Action Against Drugs conference held in Sweden in September 2008.

This first, important conference was billed as a gathering of people from around the world engaged in combating drugs at the grassroots level; men and women from all walks of life who were passionate about reducing drug abuse and illegal drug trafficking.

In his conference address, MR Disnadda Diskul referred to the Mae Fah Luang Foundation established by the late Princess Mother as a “practitioner” of Sustainable Alternative Livelihood Development, or S-A-L-D. “SALD,” he explained to attendees “is ‘people-centric’ – designed to help people help themselves.”

Outlining the task facing Thailand twenty years earlier, he recounted the work undertaken under the auspices of the Doi Tung Development Project at the very heart of the infamous Golden Triangle: “In the past, ethnic hill tribe minorities used to grow opium because it was their sole means of survival.

“We worked to improve health, create employment and provide access to formal education for about 11,000 people at Doi Tung – ex-growers, traffickers and recovering addicts alike.”



Sharing expertise is an important function of the DTDP



Overseas visitors are welcome at the DTDP

The Secretary General went on to explain that over time the people of Doi Tung were given choices: "...a choice to work on the project's macadamia economic forests, or in coffee-roasting plants. They have the choice to work at our tourist destinations, guest houses, and gardens."

MR Disnadda said the staff can tell their own, personal stories to customers at Doi Tung cafes and lifestyle shops scattered throughout the country. "Daughters who had been sold to work in the sex industry," he told delegates, "now work in tissue culture facilities in the agro - business, and in sales and many other alternatives."

Giving further examples of the "people-centric" qualities of SALD as practised at Doi Tung, MR Disnadda spoke of how grandmothers can choose to work in the handicraft centre alongside their children, creating a world-class fashion line; how ex-addicts have helped reforest barren hillsides, casualties of slash-and-burn farming, and how ex-opium growers learnt landscape design.

"These local people," he said, praising their efforts, "have made Doi Tung a signature Thai brand. Opium is all but a thing of the past. Most of all, the people have regained their pride and dignity, which money can't buy. They dare to dream of a brighter future for their children."

The Mae Fah Luang Foundation was asked by the Thai government, foreign governments and various international organisations, to assist in developing and upgrading the quality of life in many worldwide communities. The foundation has used its SALD experience gained in Myanmar, Indonesia and Afghanistan as a

way to disseminate and inculcate “best practices and lessons” accumulated through continuous and solid development work under the Doi Tung Development Project.

The Doi Tung Development Project was envisaged as a thirty-year plan under which disadvantaged and impoverished communities would first be equipped with health services followed by the development of sustainable and environmentally-friendly economic opportunities. That way, the quality of life of villagers could be improved progressively as a community’s capacity developed.

The SALD approach, undertaken as part of the vision of the late Princess Mother, today ensures appropriate education and training for new opportunities, and allows for full economic and social integration. Community ownership is an integral part of the approach. The overall objective is to hand-back economically-viable businesses to local communities when local people have the capacity to manage them on their own. Doi Tung is a successful business model that has not gone unnoticed by the international community.

The DTDP is a successful business model shared with other countries



Reaching out to the international community Yaungkha Development Project, Shan State, Republic of Union of Myanmar

The success of the SALD model set up under the Doi Tung Development Project prompted a request from the governments of Thailand and Myanmar to reach out to Myanmar’s Shan State area and a village of 6,000 ethnic minorities whose lives were at one time supported by opium cultivation.

The foundation shared its experiences and expertise in SALD to address the severe local conditions encountered on arrival in Myanmar. Many people were dying almost daily from malaria, tuberculosis and other diseases. Food supplies were inadequate; children were dying from malnutrition. Six thousand people were victims of a vicious cycle of sickness, poverty and ignorance. Their overriding concern was simply to survive.

MR Disnadda said the people were living a hand-to-mouth existence similar to the people of Doi Tung over twenty five years earlier. “Opium was traded openly in the market right next to rice sellers,” the Secretary General explained.



Engaging in a “quick hit” programme, after overcoming resistance from local people who were at first sceptical, the foundation set up a mobile medical unit to provide a cure for immediate health problems. This earned the trust of the local community and soon a 16-bed hospital and school for 500 students followed. Local residents attached great importance to medical care as it was an urgent requirement.

On the economic front, the foundation’s surveyors assisted local folk to construct a thirty kilometre irrigation canal to enable them to grow crops three times a year.

“The villagers voluntarily dug the canal by hand in ten days,” MR Disnadda said, “without using any machines or a single drop of oil. If we used tractors or water pumps the canal would cost a lot more with the money going to corporations and not the people.”

The MFLF did not just build a school but also designed a practical skills curriculum to complement formal education. Students were able to learn agricultural skills from the school’s vegetable plots, chicken coop and fish ponds all of which provided a source of food for school lunches.

In three years, the local community became self-reliant in food and earned the equivalent of US\$ 700,000 in cash and kind. The entire three-year investment amounted to US\$ 640,000 – about ten cents per person per day.

Reforested hillsides of northern Thailand



Livestock Promotion and Community Enterprise Development Programme, Afghanistan

In 2002, the British government, mindful of the foundation's contribution to suppress opium poppy cultivation in the Golden Triangle, invited the MFLF to share its Doi Tung experience with Afghanistan. Following a conference in Kabul, Afghan delegations made study visits to the Doi Tung Development Project and attended development-training programmes.

Four years later, the government of Belgium requested the MFLF to work with them and the Afghan government in a bid to launch a SALD project in Afghanistan under the Livestock Promotion and Community Enterprise Development Programme, known as A4 Sheep Bank (A4SB), in Balkh province. The programme was launched in November 2006 as a measure to counteract opium cultivation; Balkh province was the third largest opium cultivation area in the country.

"The Afghans had already been through so much fighting and would never trust us enough to work with us if we adopted a shoot-first-and-ask later approach," MR Disnadda explained. "So our approach was to convert the warlords and drug lords into legitimate businessmen."

The project was based upon sheep because of their importance as an asset in the rural Afghan economy. Also, there is a great deal of potential for adding value through sheep-derived products like yarn, carpets, food products, and skins. The A4SB programme began by taking care of the health of sheep to reduce mortality rates and increase herd populations, which were in decline from years of conflict and drought.

"When we arrived, we found that the sheep population had been reduced by almost ninety percent through decades of war," the Secretary General recalled, "so our first step was to reduce mortality and increase fertility rates. Our mobile vet programme brought down the sheep mortality rate from ten to thirty percent to just two percent in the first six months."

The scheme works through a subscription-based veterinary service provided by trained Afghan paraveterinarians. As a quid pro quo, sheep owners who opt to participate in the veterinary service have to pay the "sheep bank" a percentage of their newborn, female lambs each year. Lambs "deposited" in this way are "loaned" to economically vulnerable families identified by local communities. By November 2008, two years after starting the project, A4SB had made an enormous impact. The mortality rate for flocks within the programme dropped in two years to under three percent. In monetary terms, each registered sheep owner increased his total asset value by some six hundred and forty dollars a year.

More is being done to introduce value-added activities to enhance off-farm income. For example, local sheep owners will be able to utilise wool processing, tanning, and carpet weaving activities that have a higher value development potential.





Other countries wishing to emulate the success of the DTDP are reaching out to the Mae Fah Luang Foundation

Sustainable Alternative Livelihood Development Programme, Aceh, Indonesia

The catastrophic 2004 Indian Ocean tsunami that devastated Indonesia's Aceh Province also destroyed the livelihood of thousands of people. Left intact, however, were hillsides of cannabis, which, in former times, had been used as currency to purchase weapons to conduct civil conflict.

In 2005, Indonesia's government, accepting a recommendation from the UNODC, called upon the MFLF to share its experience in addressing the problem of poverty and interrelated cannabis cultivation in Aceh. Based on the provincial governor's vision, the MFLF set out to increase per capita income from one dollar a day to two dollars a day for 1,500,000 impoverished Acehnese.

The foundation began with health care first by introducing a “holistic malaria preparedness programme” for Mukim Lamteuba, a village cluster of almost 5,000 people. At first the local villagers were wary of MFLF (similar to Myanmar and Afghanistan). However, team members were able to show through words and deeds that they carried no hidden agenda and were committed to improving the people’s well-being so that one day the villagers would be capable of conducting their own development.

Local representatives were trained to fight malaria. Within three months the disease was almost totally eradicated from Lamteuba. The programme has been extended throughout Aceh and, eventually, the Indonesia government will introduce it to other provinces. In conjunction with the Sambinoe Foundation, the MFLF also worked with grassroots communities on “sustainable rural development programmes” for Aceh Province.

A core objective of the “Aceh-SALD” initiative is to revive the traditional “gotong royong” (collaborative events) in a spirit of co-operation and unity in local communities, empowering them to improve their own livelihoods.

For its contribution to the project in Lamteuba, the MFLF received an “Anti-Drug Award” from His Excellency Susilo Bambang Yudhyono, former President of Indonesia. Today, the Sustainable Rural Development Centre in Maheng-Lamcot is a learning centre for other areas in Aceh welcoming over a hundred visits a year from national and provincial government officials, private sector individuals and international donors.



Looking to the future

This “living university” has conveyed the paradigm of development from the Doi Tung Development Project to diverse areas in Thailand and around the world.

“The main focus,” the Secretary General explained, “is to get people to look beyond their immediate roles and responsibilities and realise their potential to help others. It’s an attempt to shift into a new paradigm; restoring the balance of society, nature and economics. We hope to share with the world a new management theory – the management for the common good – a moral art we all need to develop.”

Given the same degree of energy and sense of commitment devoted by the foundation to the Doi Tung Development Project in Chiang Rai Province, this is not an implausible concept.

From the time of its inception, the Doi Tung Development Project has brought change to many areas. It has pioneered the transformation of once barren hillsides, almost bereft of forest resources after years of indiscriminate slash-and-burn farming, into green and fertile forests, providing communities with a sustainable livelihood. After decades of development work, the Mae Fah Luang Foundation has amassed a tried-and-tested set of best practices based on the evolving SALD model in Doi Tung that has crossed international borders and captured the attention and appreciation of several countries.



Barren hillsides were transformed into productive forested area in less than thirty years





The Thai Red Cross Society





The Thai Red Cross Society is Thailand's foremost humanitarian organisation

THE THAI RED CROSS SOCIETY

The Thai Red Cross Society, founded in 1893, and one of the oldest societies' in the region, is the main humanitarian entity in Thailand providing public services as an integral part of the International Federation of Red Cross and Red Crescent Movement (IFRC). The movement constitutes the world's largest humanitarian organisation, with 189 members.

The IFRC enshrines an international humanitarian mission that relies on the support of some 17,000,000 volunteers around the world. Its ideals, which are universal, are to protect human life and health; to ensure respect for the human being, and to prevent and alleviate human suffering, regardless of nationality, race, gender, religious beliefs, class or ideology.

In common with the IFRC, the Thai Red Cross Society (TRCS) upholds the seven fundamental principles of humanity, impartiality, neutrality, independence, voluntary service, unity and universality.

In times of war and peace, conflicts and disasters, the Thai Red Cross Society provides humanitarian aid and relief services through its 14 bureaux and 10 specialised agencies.





Inauguration of the Red Unalom Society of Siam was approved by HM King Chulalongkorn (Rama V) to aid casualties of war



HM Queen Savang Vadhana

A society born out of armed conflict

It is said that necessity is the mother of invention: If we absolutely need to do something that has never been done before, we will find a way to do it! So it was with the Red Unalom Society of Siam.

In 1893, a territorial dispute between the Kingdom of Siam and France over the left bank of the River Mekong erupted into armed conflict resulting in deaths and injuries on the Thai side. From this dispute arose urgent need to extend humanitarian assistance to those injured in the conflict. Something had to be done in the aftermath of war.

Subsequent to the conflict a concerned group of charitable ladies, led by Thanpuying Plian Pasakoravongs, sought an audience with HM Queen Savang Vadhana to obtain approval from HM King Chulalongkorn (Rama V) to establish the Red Unalom Society of Siam to provide relief and assistance to injured soldiers and war victims. Considering it a commendable idea, the King gave his consent, at the same time granting royal patronage to the society from when it came into existence in April 1893.

King Chulalongkorn also encouraged a drive to raise public donations that resulted in a start-up fund of over 400,000 baht – a huge sum in those days. His Majesty appointed Queen Savang Vadhana as the “Founding Mother” of the Society; Queen Saovabha Phongsri as President, and Thanpuying Plian Pasakoravongs as Secretary-General of the Red Unalom Society of Siam. Thirty years prior to this, Henry Dunant had founded the International Committee of the Red Cross (ICRC) in Geneva, Switzerland.



HM Queen Savang Vadhana (seated centre) with high-ranking officials of the Red Unalom Society of Siam – later renamed the Thai Red Cross Society

On his return to Thailand, via Japan, after studying in the United Kingdom, HRH Crown Prince Vajiravudh (later King Rama VI) paid a visit to a Japanese Red Cross hospital and was most impressed by what he saw.

Following the death of King Chulalongkorn, the Crown Prince ascended to the throne as King Vajiravudh (Rama VI). Still carrying with him impressions of the Japanese Red Cross hospital he had visited, one of the King's early duties was to persuade his younger brothers and sisters to pool funds with the Red Unalom Society to build a hospital on the King's private property. The hospital was named King Chulalongkorn Memorial Hospital in commemoration of the late King and was placed under the supervision of the Red Unalom Society also known, from 1914, as the Red Cross Society of Siam. The name changed again in 1939 when "The Kingdom of Siam" became "The Kingdom of Thailand".

Following royal decrees in 1918 and 1920 it was renamed the Siam Red Cross Society (SRCS), recognised by the ICRC in 1920 and as a member of the International Federation in 1921. A year later in Bangkok, the society hosted the first Oriental Red Cross Conference convened by the League of Red Cross Societies. The Thai Red Cross is one of a few societies in the world operating its own hospitals.

As relief work is one of the mandates of the Red Cross and Red Crescent throughout the world, the Relief and Community Health Bureau was established in 1920 and has been active ever since.

In 1922, the Queen Saovabha Memorial Institute was inaugurated and given the responsibility of researching and producing vaccines and sera. Later the Snake Farm was established to produce antivenom sera – the second farm of its type in the world.

A number of other significant developments followed including the inauguration of the Junior Red Cross Division (1922), which underwent a name change to Red Cross Youth; first Red Cross Fair (1925); establishment of the Thai Red Cross Volunteers Division (1940), and that of Red Cross Provincial Chapters throughout the country in 1962.

Meanwhile, the Queen Savang Vadhana Memorial Hospital in Si Racha, Chon Buri Province, founded in 1902, was transferred to the Thai Red Cross Society in 1928; the first floating clinic, the *Vejapah*, came into service using a barge graciously donated by His Majesty King Bhumibol Adulyadej in 1955. The Thai Red Cross Rehabilitation Centre was set up in 1962; the Eye



Bank of the Thai Red Cross for cornea transplants came into operation in 1965, and the National Blood Centre was established in 1969.



Up to the present day, the Thai Red Cross Society remains under royal patronage

Under the Royal Patronage

Since its inception, the Thai Red Cross Society has enjoyed the close involvement and continuous support of Thailand's royal family and, up to the present day, remains under the royal patronage.

Early in the present reign of King Bhumibol Adulyadej (Rama IX), HM Queen Savang Vadhana, the Royal Grandmother, served as President of the Thai Red Cross Society. In 1954, HM Queen Sirikit accepted a special membership in the Thai Junior Red Cross under Her Majesty's royal patronage and Her Majesty was appointed by the King to take over the presidency of the Thai Red Cross Society in 1956 after the demise of Queen Savang Vadhana in 1955. Later, HRH Princess Maha Chakri Sirindhorn assumed the role of Executive Vice President of the society's council.

For more than a century, under the royal family of Thailand's guidance and assiduous support, the Thai Red Cross Society has expanded both in size and scope, reaching out to those in need whether within or outside the Kingdom.

By remaining true to its mission to alleviate human suffering and provide health services to the most vulnerable, including children, women, the elderly and the physically and mentally challenged, the society's humanitarian concern aptly complements the ideals and principles of the Royal House of Chakri.



The Society has expanded in size and scope with guidance from Thailand's Royal Family



Royal activities undertaken by the President of the Thai Red Cross Society



Her Majesty Queen Sirikit visited refugee camps in Thailand's border areas

The society's main activities

In pursuit of its mission to alleviate human suffering and provide health services to the most vulnerable, the Thai Red Cross Society directs its efforts in four core areas: medical and health care services, disaster preparedness and response, blood transfusion services, and the promotion of the quality of life of vulnerable people. All four areas respond to the humanitarian needs of society that form the underlying work of the Thai Red Cross under the seven fundamental principles of humanity, impartiality, neutrality, independence, voluntary service, unity and universality.

The work of the Thai Red Cross Society is not restricted to Thailand alone: its efforts extend into neighbouring countries such as Myanmar, Lao PDR and Cambodia. A spokesperson at the Thai Red Cross Society headquarters on Henry Dunant Road, Bangkok, touched upon the “sensitivities” of helping other countries. He said the society “...wants to offer assistance, but just can't go in with offers of help...we prefer them to approach us first.”

This is an area, he explained, where HM Queen Sirikit and HRH Princess Sirindhorn are able to help by dealing with any delicate or sensitive issues “...because neighbouring countries hold great affection for Her Majesty and Her Royal Highness with whom they feel comfortable in discussing their own country's humanitarian needs.”



Medical and health care

In Thailand, two general hospitals under the supervision of the Thai Red Cross Society provide medical and health care services: the King Chulalongkorn Memorial Hospital in Bangkok and the Queen Savang Vadhana Memorial Hospital at Si Racha on Thailand's eastern seaboard. The Red Cross Rehabilitation Centre in Samut Prakan Province, which is close to Bangkok, also provides physical treatment and rehabilitation services for long-term patients. Various other health care and specialized units, such as the Eye Bank, Organ Donation Centre, and AIDS Research Centre were established at different times.

The King Chulalongkorn Memorial Hospital deals with primary to tertiary or referral cases for inpatients and outpatients and provides training facilities for medical students of the Faculty of Medicine, Chulalongkorn University and for nursing students of the Thai Red Cross College of Nursing. It has been the mainstay of the Thai Red Cross in times of peace and in times of disasters. The hospital was recognised in 2002 for its highly professional standards with the Award of the Hospital Accreditation Certificate by the Institute of Hospital Quality Improvement and Accreditation of Thailand. A leader in many fields, including neurosurgery, eye surgery and cardiac surgery, for example, the hospital registered several "firsts" in medical history: first cornea transplant in 1962; first kidney transplant in 1972, and first bone-marrow transplant in 1991. Thailand's first test-tube baby was born there in 1987.



The King Chulalongkorn Memorial Hospital is a leader in many fields including neurosurgery, eye surgery and cardiac surgery



The hospital provides training for nursing students of the Thai Red Cross College of Nursing

The Queen Savang Vadhana Memorial Hospital in Si Racha, Chon Buri Province provides a complete range of medical services with specialised clinics in urology, eye ailments, ENT problems, diabetes, allergies and much more.

The hospital has a mobile blood donation service and personnel skills are constantly developed to stay abreast with changes in medical science and technology.

Formerly known as the Pasteur Institute, the Queen Saovabha Memorial Institute, established in 1922, undertakes research and produces vaccines and snake sera. A year later, Thailand established the Snake Farm to produce antivenom sera for snake-bite victims milking highly venomous snakes on a daily basis to make antidotes for snake bites.

This delicate operation can be observed by members of the public at venom-milking and snake-handling demonstrations at the institute which also gives visitors comprehensive information on herpetology and toxicology. Located on Henry Dunant Road in Bangkok, the Snake Farm has also become a popular tourist attraction.



The Queen Savang Vadhana Memorial Hospital is located on the Gulf of Thailand in Chon Buri Province



At the Snake Farm venomous snakes are milked daily to make antidotes for victims of snake bites

The Queen Saovabha Memorial Institute

Apart from offering services such as the production of snake antivenins, rabies vaccines, BCG, and drinking water, the Thai Red Cross Society also undertakes research and offers other services at its clinics including the Rabies Immunisation Clinic, the Animal Toxin Clinic and the Immunisation and Travel Clinic.

The society has also cooperated with local and international organisations to conduct various research projects. In Thailand, for example, it has carried out a continuous, joint *Clostridium botulinum* research and development project with the Department of Medical Sciences. The society also agreed with the Faculty of Pharmaceutical Sciences of Ubon Ratchathani University to allow Pharmacy students to be trained at the Thai Red Cross Society.

As for international cooperation, the Thai Red Cross Society has signed a memorandum of understanding (MOU) with the Republic of Korea's Green Cross Corporation to provide training for personnel involved with vaccination services and vaccine production.

In addition, it has offered training and study tours for both Thai and foreign students and personnel. Overseas students and personnel are mainly from Malaysia, Singapore, Myanmar, Cambodia, Brunei Darussalam, China, Japan, Iran, Brazil, and Italy. In recent years, however, the Thai Red Cross Society has welcomed foreign visitors from a variety of countries:

- On December 13, 2012, Tatsuya Matsumoto (DVM) Kumamoto Prefectural Government, Japan, for study at the Department of Animal Diagnosis and Investigation;
- On December 18, 2012, SMK Tinggi Kajang Selangor, Malaysian Red Crescent, for study at the Snake Farm;
- On January 22, 2013, delegation from the Chinese government, for study at the Snake Farm;
- On February 28, 2013, the Iranian Red Crescent Society, for study at the Snake Farm;
- On 26 March 2013, Dr In Sotheary (MD) & Hing Chanthy (R.N.), Pasteur Institute, Phnom Penh, Cambodia, for study at the Department of Animal Diagnosis and Investigation;
- On June 11, 2013, Dr Laura Pacifici, Advisor for ItRC International Health Cooperation, Italian Red Cross, for study at the Snake Farm;
- On August 28, 2013, delegations from the International Committee of the Red Cross (ICRC) in Kuala Lumpur and in Brunei Darussalam and a group of Brunei education personnel, for study at the Snake Farm.

The Thai Red Cross Society also organised conferences for public health personnel to offer knowledge and experience to benefit their professions and social services. Topics included "Snake Biology and Toxicology in Thailand"; "Immunisation and



Travel Medicine: From Guidelines to Practice"; "Practical Approach for Common Envenoming and Poisoning by Animals Toxins"; and "BCG Vaccine: Update Information."



HRH Princess Maha Chakri Sirindhorn chairs meetings of the society's council

Disaster preparedness and response

Right from the beginning, the Thai Red Cross Society has provided relief in times of disasters and national emergencies – not just in Thailand but in the region and internationally through its Relief and Community Health Bureau working in conjunction with other groups. Through its response to a series of disasters and emergencies (during peacetime and times of conflict) the bureau has synchronised its operations for disaster preparedness and response, gaining recognition for the Thai Red Cross – and Thailand – in all corners of the world.

Alert and prepared under a twenty-four-hour state of readiness, the Disaster Operations Centre responds to tragedies and emergencies in line with national and provincial plans for disaster preparedness, response and rehabilitation. It coordinates information on epidemics and disasters, appropriate care and assistance, and on the availability of resources at all sites to evaluate needs and issue proper directives. The aim is to respond in good time to ensure relief materials and medical supplies are sourced and prepared for distribution to meet each developing circumstance.

The bureau, which began operations in December 1920 as the “relief section” of the Siam Red Cross Society, also provides the public with first aid training courses as part of disaster preparedness.



The Disaster Operations Centre operates under a twenty-four-hour state of readiness

In the context of regional disasters, the catastrophic tsunami in the Indian Ocean in December 2004, following a major offshore earthquake near Sumatra, Indonesia, galvanised the Thai Red Cross Society into emergency relief action as well as short- and long-term recovery programmes.

In recent times, Thailand's borders have strained under the weight of hundreds of thousands of displaced persons escaping from armed conflicts, for example, in Cambodia and Myanmar. At such times, the Thai Red Cross Society was on hand with relief supplies and offered assistance programmes providing food, clothing and other items. Timely action by the society has averted major human tragedies in the wake of horrendous conflicts; in particular unspeakably cruel acts of genocide against Cambodian citizens who fled across the Thai border to safety.



The Thai Red Cross was also quick to respond with relief efforts when a devastating tropical cyclone (Cyclone Nargis) came ashore in Myanmar's Ayeyarwaddy Division causing over 100,000 deaths and many more injured and displaced people. In January 2010, the magnitude $7.0M_w^*$ earthquake that struck the Caribbean nation of Haiti affected an estimated three million people prompting one of the greatest responses in the 150-year history of the International Red Cross and Red Crescent Movement. The Thai Red Cross Society contributed donations totalling US\$3,690,000 to support relief efforts. At the time, Bekele Geleta, Secretary General of the International Federation of Red Cross and Red Crescent Societies (IFRC) expressed his appreciation and extended his profound admiration and pride in the Thai Red Cross Society's initiative. Acknowledging the generosity of all Thai people, Thai Red Cross staff and volunteer workers, Mr Geleta said it demonstrated great commitment and solidarity towards helping alleviate human suffering in Haiti's devastated communities.

**The moment magnitude scale (abbreviated as MMS; denoted as M_w) is used by seismologists to measure the size of earthquakes in terms of the energy released. The scale was developed in the 1970s to succeed the 1930s-era Richter magnitude scale (M_L). Even though the formulae are different, the new scale retains the familiar continuum of magnitude values defined by the older one. The MMS is now the scale used to estimate magnitudes for all modern large earthquakes by the United States Geological Survey.*



Her Royal Highness Princess Maha Chakri Sirindhorn graciously presented a donation from the Thai Red Cross Society to the Philippines Ambassador to Thailand to help Typhoon Haiyan victims

When, in 2011, Thailand suffered its worst flooding in more than half a century, the Thai Red Cross Society offered assistance valued at 384,000,000 baht to 387,902 families of Thai citizens and migrant workers from Laos, Cambodia and Myanmar. More than 1,000,000 people benefitted from this assistance. The society also received over one billion baht in financial support from other Red Cross societies, foreign governments and private organisations.

In the same year, a magnitude 9.0 earthquake triggered a tsunami off Japan's northeast coast. To assist, the Thai Red Cross Society mobilised funds from all sectors of society to help Japan by working through the Japanese Red Cross Society. Three years later, in 2014, a typhoon named Haiyan (Yolanda) struck the Philippines and, as a gesture of support, the Thai Red Cross Society provided humanitarian aid worth US\$1,500,000 via the Philippines Ambassador to Thailand and the Philippines Red Cross Society.





Regular blood donors are honoured with certificates presented by HM the Queen

Blood transfusion services

Blood, “the fluid of life”, especially in the context of life-saving transfusions, is under the jurisdiction of the Thai Red Cross Society’s National Blood Centre (previously Office of the Blood Service Unit) graciously inaugurated by Their Majesties the King and Queen of Thailand in 1953. It is entrusted with procuring and storing adequate, safe supplies of blood for the whole of Thailand. Over the years, blood donors have increased in number since the first group of ten donors gave blood following the example of HRH Prince Paribatra Sukhumbhand who, at the time, was Executive Vice President of the Thai Red Cross Society.

Donor recruitment drives take place in Thailand on a year-round basis with special campaigns organised to coincide with auspicious occasions in the lives of Thailand’s royal family. Regular blood donors are honoured with pins and certificates often presented by HM the Queen (President of the society), HRH Princess Maha Chakri Sirindhorn Executive Vice President of the Thai Red Cross Society, and HRH Princess Soamsawali.

The centre was appointed WHO Collaborating Centre for Training in Blood Transfusion Medicine (2004-2007), and has cooperated with the Japanese Red Cross since 1995 in organising the Red Cross and Red Crescent Symposium on **Blood Programmes in the Asian Region, Securing Safe Blood**. Also, in conjunction with the Thai Society of Haematology, the Thai Red Cross hosted the **Asia XVI Regional Congress of the International Society of Blood Transfusion** in Bangkok from November 12 to 15, 2005.



Community health and quality of life promotion

The Thai Red Cross Society operates twelve Red Cross Health Stations around Thailand with each one directed towards improving the wellbeing of people through health and welfare education to home visits and blood donation campaigns. These stations also serve as relief centres in times of disaster. One unit of particular interest at health stations is the Princess Sirindhorn Eye Surgery Unit started in 1995 to coincide with the Princess' fortieth birthday anniversary.



More remote areas, and areas populated by disadvantaged citizens, receive medical and dental services from mobile units including a floating clinic aboard the barge *Vejapah* donated by His Majesty the King in 1955. The floating clinic offers medical and dental care to residents living alongside the Chao Phraya River and canals in central Thailand.



The Princess Sirindhorn Eye Surgery Unit started in 1995



*The floating clinic on the barge *Vejapah* provides medical and dental care to riverside residents*

Since the very beginning, the Thai Red Cross Society has expanded its organisation and increased its services to serve the people in keeping with the Red Cross spirit and with help and support from all sectors of society, in particular Thailand's royal family which has been the inspiration of the movement from the very beginning.

Comprehensive and Excellent Medical and Health Care

This is a programme of medical and health care which forms part of the Thai Red Cross Society's strategy implemented by the Relief and Public Health Bureau. It comprises medical services, both general and specialised, for the poor and underprivileged as well as those living in remote rural areas. The major activities are:

1. The Princess Sirindhorn Mobile Eye Surgery Clinic provides free eye treatment in various provinces nationwide for people with cataracts, glaucoma, and eyelid diseases;
2. The Cosmetic Surgery Project for Cleft Lip and Palate and Other Deformities, in cooperation with King Chulalongkorn Memorial Hospital, and volunteers from the public and private sectors, provides treatment and conducts surgery operations for patients at provincial hospitals;
3. The Hearing Lost and Found Project;
4. Mobile Dental Care Service;
5. Mobile Medical Services to improve the quality of life of the underprivileged in various provinces and remote rural areas.

Under all of these activities, a great number of patients have benefited from medical treatment and care.



Role and involvement of Thailand's Royal Family

At all stages in the development of the Thai Red Cross Society, members of Thailand's royal family have played an important guiding role. His Majesty King Bhumibol Adulyadej is patron of the society and HM Queen Sirikit serves as President with HRH Princess Maha Chakri Sirindhorn as Executive Vice President also chairing the Thai Red Cross Council. Other key personnel include Mr Phan Wannamethee, who is Secretary General of the Thai Red Cross Society.

When it was established in 1893, the society was known as the Red Unalom Society of Siam formed with private funding from the royal family. It was renamed the Siam Red Cross Society in 1920 with Queen Saovabha Phongsri as its president. A year later, the society joined the ranks of the International Federation of the Red Cross and Red Crescent Societies.

The society's close association with the nation's royal family is not just a time-honoured tradition; support from the royal family constitutes a driving force behind the organization's great success and prestigious status in the world. With Her Majesty the Queen at the helm, the latent power of Thai womanhood has been harnessed, as can be seen from the strong network of volunteers formed by wives of provincial governors and other high-profile ladies who eagerly support the diverse activities of the Red Cross.



The Queen inspired a network of volunteers to support the society

Early in the present reign, the Queen graciously accepted a special membership of the Thai Junior Red Cross, taking the unit under Her Majesty's royal patronage. After HM Queen Savang Vadhana, the Royal Grandmother passed away in 1955, His Majesty the King conferred upon HM Queen Sirikit the presidency of the Thai Red Cross on the Queen's birthday on August 12, 1956. This marked the beginning of a whole new era for the Thai Red Cross Society benefiting the poor and underprivileged, not only in Thailand but around the world.

Her Majesty's poise and composure, great compassion and kindness, combined with firsthand experience gained during extensive royal visits accompanying His Majesty the King to remote rural areas of the country, inspired her to embrace wholeheartedly the Red Cross operation and take it to new heights.

Under the gracious leadership of Her Majesty, Thai Red Cross activities expanded by leaps and bounds with the establishment of the Thai Red Cross Provincial Chapters throughout the country in 1962. The Thai Red Cross Rehabilitation Centre in Samut Prakan Province came into operation in the same year; the Eye Bank for cornea transplants in 1965; the National Blood Centre in 1969; the Thai Red Cross Children's Home in 1981, and the opening of the Thai Red Cross Programme on AIDS in 1991 – today known as the Thai Red Cross AIDS Research Centre.



Thai Red Cross activities have expanded under the gracious leadership of Her Majesty the Queen



More health care and relief service centres followed: The Organ Donation Centre was established in 1994; the Cardiac Centre in the King Chulalongkorn Memorial Hospital in 1995; the Princess Sirindhorn Eye Surgery Mobile Unit in 2001 and the First Aid and Health Care Training Centre and the Craniofacial Centre in the King

Chulalongkorn Memorial Hospital. In 2005, the Queen Sirikit Centre for Breast Cancer was established also in the King Chulalongkorn Memorial Hospital. Today, the Thai Red Cross Society forms a major network of health care and relief services and is by far the biggest humanitarian organization in Thailand.



The Thai Red Cross Society constitutes a major network of health care and relief services

Provincial chapters and district branches

Performing under the jurisdiction of the Thai Red Cross Society (TRCS), provincial Red Cross chapters were established in 1962 in each of Thailand's seventy-five provinces. Each provincial chapter has its own district branches carrying out the work of the TRCS at district level across the entire country. Staffed mainly on a voluntary basis, the work covers the society's four main areas of interest: disaster relief, blood donation services, quality of life promotion, and social welfare services.

Working with the society for over twenty years (with the early part spent in Betong District in the southern province of Yala at the border with Malaysia) Mrs Prissana Pongtadsirikul, former Director General of the Office of Contemporary Art and Culture, spoke of her role as chairperson of the Thai Red Cross provincial chapter in the Province of Chachoengsao in Thailand's central region.

"For the past six years I have worked with the Chachoengsao chapter helping with projects initiated by Her Majesty the Queen and by Her Royal Highness Princess Maha Chakri Sirindhorn," she said speaking of the holistic centres initiated by the Princess for people of advancing age in the eleven districts of Chachoengsao Province.



Red Cross chapters in seventy-five provinces of the country are staffed mainly on a voluntary basis



Each Red Cross chapter works closely with hospitals and personnel from the Ministry of Public Health

“Apart from providing help for the elderly, Her Royal Highness also focuses on the requirements of young people particularly their education. Today, every provincial chapter helps to take care of students under Her Royal Highness’ patronage from elementary school until receiving a bachelor’s degree, if they have the ability.”

Much of the work carried out by the chapter, Mrs Prissana explained, entails visiting students at their homes to see how they live, and then discussing with teachers what more is required to help them further. “We report back to Her Royal Highness who makes certain each chapter is able to support the students with money, uniforms, books...even reading glasses if required. Funding comes directly from Her Royal Highness’ foundation into students’ accounts.”

Explaining how the chapters work with representatives from government departments, Mrs Prissana said. “We never work alone. We try to integrate with government agencies. For example each province has a human security and welfare office under the Ministry of Social Development and Human Security and we work with them in helping to improve the quality of people’s lives.”

Where patients are concerned, the chapters work closely with hospitals and personnel from the Ministry of Public Health. Volunteers involved with blood donors liaise with provincial hospitals and, for disaster and relief work, with the Ministry of Interior.

“A few years ago I worked in Sa Kaew Province that borders with Cambodia,” Mrs Prissana said. “We had a close working relationship with a Cambodia Red Cross chapter. We even helped Cambodians gain access to hospitals in the province for minor surgery with transportation provided by a Red Cross mobile unit that used to journey to Sa Kaew from Bangkok.”

Fundraising is an essential part of the Thai Red Cross Society and each chapter focuses on this important aspect on a year-round basis. “Our big event in Chachoengsao is our annual charity fair to raise money,” Mrs Prissana said. “We also have people coming to us to donate money on their birthdays... strange as it may seem, some people even like to donate money after attending a funeral service.”



The Queen intervened in the developing crisis on the Thai-Cambodian border

Refugees at the border

One of Thailand's eastern neighbours, Cambodia, tested the state of readiness of Thai Red Cross facilities in 1979 after the country was invaded by the Vietnamese army along with allies from the Kampuchean United Front for National Salvation (KUFNS). Pol Pot's Khmer Rouge forces retreated towards the Thai border but, by that time, Cambodians had already endured four years of cruel war and genocide perpetrated by the Khmer Rouge, acts that impelled thousands of frightened citizens to mass along the Thai border.

Civil war broke out with the foreign-backed troops involved in a battle for control of the country, which resulted in tens of thousands of displaced Cambodians – starving, desolate and terrified – fleeing into Thailand's Trat province to an area known as Khao Lan.

Realizing the high security and safety risks on the country and the Thai people living in the border areas, the government under the Prime Minister Kriengsak Chamanan initially closed the border. However, for many Cambodians pushed back, it meant certain death by the hands of their pursuers occupying Cambodia.

Dr Suvit Yodmani, the then government spokesman on foreign affairs explained: "Her Majesty reacted very strongly after receiving a report from Prof Dr M L Kashetra Snidvongs, at that time Secretary-General of the Thai Red Cross Society, expressing grave concern for what was turning into a humanitarian crisis. Prime Minister Kriengsak was convinced that it was essential for Thailand to open the border in order to provide the badly needed humanitarian assistance."



Civil war in Cambodia fully tested the Thai Red Cross Society's humanitarian response

However, before reopening the border, the Prime Minister ordered the relocation of some villagers to safer areas; then, with the assistance of the UNHCR, camps were established for the refugees. “This was accomplished, and in late October 1979 the PM inspected the border areas and publicly declared the border open,” Dr Suvit added.

The present Secretary-General of the Thai Red Cross, Mr Phan Wannamethee, also spoke of HM Queen Sirikit's personal intervention during these tense days on Thailand's border: “Her Majesty sought to provide shelter for these people under the emblem of the Thai Red Cross.” Subsequently, the Secretary-General explained, the Queen took care of the refugees for over five years until they were transferred to proper refugee camps. “This showed Her Majesty's compassion towards the Cambodian people...and it was purely her own initiative.”

Her Majesty flew to the camps to see the situation firsthand and was greeted by sights that shocked her deeply. The Queen was appalled by scenes of hunger, illness and sheer exhaustion on the part of many refugees. Representatives from the United Nations High Commissioner for Refugees (UNHCR) also arrived at the border to survey the situation.

Under the direction of Her Majesty, the Khao Lan Thai Red Cross Centre was established to oversee the border camps that provided shelter, food and medical care to desperate refugees, most of whom were poor families with small children.



Her Majesty flew to border areas to obtain a firsthand assessment of conditions in refugee camps



The Queen was not without support from her own children during visits to these desolate scenes along the Thai border. His Royal Highness Crown Prince Maha Vajiralongkorn, at the time a young military officer, worked to establish security at the camps. Her Majesty's second daughter, Princess Maha Chakri Sirindhorn was also on hand to oversee the opening of schools in the camps so children could be taught self-help and life skills to help prepare them for the future. Today, the

Princess serves as Executive Vice President of the Thai Red Cross and is a champion of children's rights.

When the border reopened, Thailand was faced with a steady stream of refugees that proved an enormous challenge for the Thai Red Cross. To assist, other camps were set up in Thailand to cope with the growing number of refugees. The most well-known of these was Khao Idang Holding Centre a huge compound of bamboo and thatched houses located close to Aranyaprathet in Thailand's Sa Kaeo Province.

Recalling the Cambodia refugee crisis of 1979, UNHCR regional director Kitty McKinsey said: "It was a huge turning point in the history of the UNHCR. It was the first real emergency we really were active in, anywhere in the world." The UNHCR had to set up camps all along the border to take care of hundreds of thousands of refugees pouring into Thailand. By 1980, the population of the camp had grown to 160,000.

"What was very clear," the regional director explained, "was that by opening the door to the Cambodian refugees many lives were saved. We do know that Her Majesty the Queen was instrumental in taking care of many children. We know that she personally flew to the site to see the Cambodian refugees and set up the Khao Lan Thai Red Cross Centre for the children."



HRH Princess Maha Chakri Sirindhorn was on hand to oversee the opening of schools in the refugee camps



HRH Princess Maha Chakri Sirindhorn serves as Executive Vice President of the society and is a champion of children's rights

According to the UNHCR, Her Majesty was responsible for taking care of at least 5,000 orphans and unaccompanied refugee children. The regional director said that the Queen's personal interest in the fate of the children was invaluable to the UNHCR because it demonstrated to the Thai public and to the government the importance of taking care of refugees. It also illustrated the importance of protecting refugees which made it easier for the UNHCR to operate.

By 1986 the border camps at Khao Lan had closed but memories of how HM Queen Sirikit, the Thai Red Cross Society's President, had allowed sanctuary for some 350,000 refugees from a neighbouring country over a period of twenty years, remain undiminished. Today, the "Royal Compassion Museum" located on the site of Khao Lan's former campsite, serves to remind all peoples what happened on the Thai-Cambodian border.

Even today, unfortunate victims of conflicts in neighbouring countries continue to view Thailand as a safe sanctuary; a land where they can harbour hopes of a better life, their care entrusted to the Thai Red Cross Society.

In 1991, Her Majesty Queen Sirikit received recognition in Washington D.C. when she was presented with an International Humanitarian Award as "...an individual of international stature who has made an outstanding contribution to improvement in the quality of life and the uplifting of large numbers of people."



Assisting victims of earthquakes and cyclones

As befits her royal parentage, HRH Princess Maha Chakri Sirindhorn looks beyond Thailand's borders to help those in need.

When a 7.8 M_w earthquake struck China's south-western province of Sichuan in May 2008, the Thai Red Cross immediately donated US\$200,000 to its Chinese counterpart, along with 250 tents and cooking utensils.

That same year, tropical cyclone Nargis, the worst natural disaster in Myanmar's recorded history, took close to 150,000 lives and caused large-scale damage that completely wiped out many people's livelihood. The Thai Red Cross Society, under guidance from Princess Sirindhorn, despatched thirty tonnes of survival equipment including medicines, generators, snake antivenom and twelve tonnes of food, along with a team of twenty doctors and nurses. To help the victims in the aftermath of this large-scale tragedy, and as part of the recovery programme, the Thai Red Cross built a small hospital, a health care station, and renovated a blood bank in Yangon, Myanmar's former capital.



Under guidance from HRH Princess Maha Chakri Sirindhorn the Thai Red Cross Society sent supplies to China and Myanmar when disaster struck in 2008

Speaking about the aftermath, Myanmar schoolteacher Tan Ku-Mar-Ree said his house was completely destroyed. "We felt helpless. We prayed even though we were terrified to speak. We had lost everything."

Today, an estimated 140,000 Myanmar refugees live in camps along the Thai-Myanmar border, and a further 1,500,000 live in Thailand as economic migrants.



Another massive earthquake disaster occurred in Pakistan in 2005 when 80,000 lives were lost after a $7.6M_w$ earthquake struck Pakistan-administered Kashmir. Response from the Thai Red Cross was swift, and Thai Airways, the national carrier, assisted in flying five tonnes of relief goods to Islamabad for distribution. His Royal Highness Crown Prince Maha Vajiralongkorn also donated private funds to assist relief efforts.



Relief effort distribution in Pakistan

The catastrophic $7.0M_w$ earthquake in the Caribbean nation of Haiti in January 2010 prompted the Thai Red Cross Society to launch an appeal for public donations to help victims. The generous response from the Thai people meant that the Red Cross could make several, large donations. A transfer of over US\$1,000,000 was made to the account of the IFRC in January 2010 to support relief operations.

Expressing appreciation to Thailand for contributions when they grew to US\$1,200,000, the IFRC Secretary-General, Mr Bekele Geleta, spoke of his profound admiration and pride at the Thai Red Cross Society's initiative that demonstrated great commitment and solidarity to help alleviate human suffering in the devastated communities in Haiti. The Secretary-General also expressed his sincere thanks to all Thai people as well as the Thai Red Cross staff and volunteers who were actively involved in fund-raising campaigns. Response to the Haiti earthquake was one of the biggest in the 150-year history of the IFRC movement. But even more help was to come from Thailand.

On February 9, 2010, the Thai Red Cross Society made another donation to the IFRC societies amounting to US\$1,000,000 for relief and recovery efforts in Haiti. In all, US\$3,690,000 came from Thailand made up of US\$50,000 from the Thai Red Cross Society and US\$3,190,000 from public donations made through the Thai Red Cross Society.



Leadership and support from the royal family

Thailand's royal family have a long history of being among the first to respond to local disasters affecting people's lives and livelihood. One of the worst natural disasters in modern times, and still fresh in everyone's mind, was the 2004 Indian Ocean tsunami, triggered by an undersea, 9.1 M_w earthquake off the west coast of Sumatra, Indonesia, which took the lives of over 200,000 people and left tens of thousands more injured, homeless and desolate.

In Thailand, entire families were wiped out by the huge waves generated by the tsunami. Even foreign visitors, holidaying in provinces bordering the Andaman Sea were affected. It was Thailand's peak holiday season and hundreds of visitors were among the dead and missing. Some managed to survive to tell of their ordeal.

British citizen Mr Aaron le Boutillier, a tsunami survivor who was living and working on Phi Phi Island related his terrifying experience: "My ordeal started off in my room. It was ten in the morning and I heard everyone screaming and by the time I got to my balcony the tsunami had hit the street and water was rushing through the balcony of my bedroom." After surviving to tell the tale, Aaron decided to write about his experiences, and of others, in a personal odyssey "*And Then One Morning*", royalties for which have been channelled to those still traumatised from the tsunami and to several, supportive foundations in southern Thailand. For many people, writing and talking about their brush with death was a vital step in the healing process.



Among those first on the scene in Thailand was the Thai Red Cross mobile medical team. With an estimated 10,000,000 people homeless, Thailand's royal family immediately took a leading role in relief efforts.

As news of the tragedy broke, HRH Crown Prince Maha Vajiralongkorn coordinated Thailand's military and police response, adopting a major role in providing emergency housing for orphaned children, and sourcing new boats for fishing communities. Simultaneously, HRH Princess Maha Chakri Sirindhorn established a base at the Thai Red Cross headquarters to oversee the distribution of relief supplies to disaster-hit areas. The Princess also coordinated much-needed blood donations for relief efforts and remained on hand to render assistance throughout the entire ordeal.

In the eyes of victims of the tsunami, particularly impoverished fishing communities who lost their loved ones and their livelihoods, Princess Sirindhorn stood as a beacon of hope. Even after the tsunami, Her Royal Highness asked Mrs Pittraporn Sangkasaba, a former classmate, to oversee a special project in southern Thailand working with the Thai Red Cross to ensure poor families living in remote coastal and inland villages received medical supplies and support funds.

Speaking as a member of Princess Sirindhorn's "special task force", Mrs Pittraporn said she worked with the Red Cross from the first day of the tsunami. "In order to learn of people's problems, the princess formed a group called 'Hippo' to coordinate with the Red Cross. All cash donations and goods handed to the Red Cross were given directly to the people in need.

"Three months after the Hippo group was formed," Mrs Pittraporn explained, "Her Royal Highness formed the Sirindhorn special unit to continue the group's work to ensure continuity."





HRH Princess Soamsawali and her daughter HRH Princess Bajrakitiyabha responded to calls for help when Bangkok was inundated with floodwater in 1995

Flooding is another form of disaster well known in much of Thailand. Flash floods in several parts of Thailand prompted a special, coordinated effort on the part of HRH Princess Bajrakitiyabha (the Crown Prince's daughter, also known as Princess "Pa") to establish the Princess Pa Foundation, Thai Red Cross Society. The foundation, which originated from the Voluntary Project of Princess Pa, Thai Red Cross Society during the period of disastrous flooding in Bangkok in 1995, has enjoyed unprecedented support from Princess Bajrakitiyabha's mother HRH Princess Soamsawali.

Offering financial support for the "decision-supporting system for flood warnings" as proposed by the Thai Meteorological Department, the foundation's main objective is to provide humanitarian support. It also seeks to complement government efforts and those of the private sector in relief missions for citizens affected by severe floods; to help those less-affected people to help the more-affected, and for those who are stronger to help the weaker by concentrating on survival and rehabilitation efforts.





HRH Princess Soamsawali is a vigorous campaigner for the Princess Pa Foundation and champions HIV and AIDS awareness programmes

The Thai Red Cross Society has also taken a leading role in Thailand and around the Southeast Asia region in the fight against HIV-AIDS, in research as well as disease prevention, counselling and treatment. In 1991, a clinic for testing for HIV and counselling was established in Bangkok offering HIV testing and counselling on a discrete basis. More than 1,000 people go to the clinic each month including foreigners wishing to take advantage of the clinic's "non-disclosure" policy.

Thailand's royal family also take a prominent role in addressing HIV-AIDS, particularly HRH Princess Soamsawali who, in addition to being a vigorous campaigner for the Princess Pa Foundation, is a driving force behind Thailand's HIV and AIDS awareness programmes. It is not unusual to see the Princess among AIDS-infected patients – especially babies – in her drive for increased government funding to supplement the Thai Red Cross Society's efforts to fight the disease.

Commenting on Her Royal Highness' initiative, Dr Prapan Panupak of the Thai Red Cross AIDS Research Centre said Princess Soamsawali is very interested and genuinely keen to help with HIV work. "Her Royal Highness contributed her own funds to set up a project called Preventing Mother-to-Child Transmission."

Princess Soamsawali's initiative has helped safeguard the future of thousands of unborn babies. Her fundraising efforts ensure that AZT is available to administer to HIV-positive pregnant women to protect their children from being infected.

In almost every facet of human tragedy, the Thai Red Cross Society plays a major role drawing on the strength of Thailand's royal family whose own ideals share a common goal with the principles and spirit of the Red Cross.





The Thai Red Cross Society's Red Cross Fair is a major fundraising event presided over by Their Majesties the King and Queen

Fund raising

To support its work as a major humanitarian network, the Thai Red Cross Society relies on contributions whether in cash or in kind. A great deal of funding is needed to finance its operations and raising money is a major function of the society. The Thai Red Cross Society's Red Cross Fair, launched during the reign of King Vajiravudh (Rama VI) and held on an annual basis, is a major fundraising event.

The first Red Cross Fair of Siam took place in 1924. An eight-member committee, chaired by HRH Prince Paribatra, was entrusted to organise the event. The objective was to publicise the activities of the Red Cross Society of Siam and to persuade members of the public to join the Society as "citizen members" and as an annual, fun-filled event for members who subscribed one Thai baht a year.

Held on the ceremonial ground at Sanam Luang in Bangkok, the first Red Cross Fair was presided over by HM King Vajiravudh in person. Members of the royal family, high-ranking officials, societies, associations and companies were all invited to enter street floats and join a procession that wound along various roads in Sanam Luang. The process was watched by huge crowds while officials, junior members,





Their Majesties the King and Queen attended gala dinner charity events to help raise funds for the Thai Red Cross Society



This Red Cross kite was flown by the young Crown Prince at a Red Cross Fair

students and scouts went among the crowd persuading onlookers to become citizen members of the society. In its first year, over 13,000 new members were recruited.

The Red Cross Fair of Siam held in 1925 was presided over by HM Queen Savang Vadhana in her capacity as president. The Queen opened the fair with an added attraction of a fancy kite display and kite contest that first started in April 1924.

This event raised over 3,400 baht of which 3,000 baht went to purchase a hospital bed inscribed “*The Kite Contest Event at Sanam Luang B.E. 2467 (1924)*”, with the remaining amount channelled to the Red Cross Society of Siam.

The following year the kite contest raised over 5,000 baht for the society, which that year had asked the League of Red Cross in Geneva, Switzerland to procure Red Cross balloons for sale at the fair. It resulted in a great deal of additional funding.

During the present reign of HM King Bhumibol Adulyadej (Rama IX), the Red Cross Fair was moved to Ambara Garden in the Dusit Palace, Bangkok, extending to the Royal Plaza and Sanam Suea Pa. A great deal of activity takes place at the fair with support from government ministries and departments, institutions, government agencies, associations, and private companies some of which set up booths to sell donated merchandise to the public to raise funds.

The Red Cross Society publicises all activities and provides health services and blood donor-drives at the fair, the opening of which used to be presided over by Their Majesties the King and Queen with other members of the royal family supporting the event each day.

The annual Red Cross Fair, normally held over nine days from the end of March into the first week of April, has become a very popular event keenly anticipated by people from all walks of life. It coincides with a number of provincial activities around the country raising funds for the Thai Red Cross Society under the common concept of “Red Cross helps us, we help the Red Cross”.

Another, major annual event is the Diplomatic Red Cross Bazaar that has been organised by the diplomatic corps in Bangkok since 1967. Countries with diplomatic missions in Thailand unite in offering for sale a variety of their own countries’ products including handicrafts and delicacies.



The Red Cross Concert, performed by the Royal Thai Navy orchestra since 1964, is an important source of funding

An important source of funding for the Thai Red Cross Society comes from the Red Cross Concert that has been performed by the Royal Thai Navy orchestra since 1964. An artistic aspect was added in 1999 when a group of volunteer amateur artists contributed paintings to be exhibited and sold to raise funds.

Anyone who wishes to contribute to the Thai Red Cross Society may do so via the society's website at www.redcross.or.th which gives details of how to make online contributions or conduct bank transfers. A senior official at the society's headquarters in Henry Dunant Road, Bangkok described how some people choose to donate their inheritances to the Thai Red Cross Society.



“Because of the reputation of the Thai Red Cross and its association with Thailand's royal family, many families without heirs donate their entire inheritance to the society.” The official also stated that some donations are sent directly to HRH Princess Maha Chakri Sirindhorn who directs them on to the Thai Red Cross.

“People are also living longer,” the official explained, “therefore we have to ensure we also use donated funds to provide facilities to train doctors and other medical staff to take care of elderly patients with specific requirements.” To meet the many challenges of an aging population, the Thai Red Cross is constructing new facilities where senior citizens can go for specialised treatment for age-related illnesses and, later, receive specialist care during periods of convalescence.



On behalf of the Thai Red Cross Society, HM the Queen graciously accepted donations from the Diplomatic Red Cross Bazaar



*The Protheses Foundation owes
its existence to the compassion
and concern shown by
HRH the late Princess Mother*

Prostheses Foundation of HRH the Princess Mother



PROSTHESES FOUNDATION OF HRH THE PRINCESS MOTHER

Sanam Luang, a vast open field and public square in front of Wat Phra Kaew and the Grand Palace, constitutes the historic centre of Bangkok, capital city of the Kingdom of Thailand. This is the traditional setting for celebrating public events such as New Year's Day, Thailand's Constitution Day, and the birthday anniversaries of Their Majesties the King and Queen. On October 1, 2000 it was also the site chosen to erect a prominent, albeit provisional, building with a sign indicating that the Prostheses Foundation of HRH the Princess Mother was ready and able to provide free prosthetic limbs to poor and needy amputees.

Inside the building, more than one hundred amputees had already registered for prostheses that would be ready to be picked up in six days. Aside from eager amputees, the building was also packed with prosthetic materials and equipment – sturdy, lightweight and practical innovations for which the foundation remains justly proud. Also assembled were a large number of foundation-based doctors, staff members and volunteer prosthetists from every part of Thailand, sharing a common purpose: to pool their skills in memory of HRH the late Princess Mother, founder of the Prostheses Foundation and its first, honorary president in commemoration of the anniversary of Her Royal Highness's centennial birthday.



HRH the Princess Mother visiting a mobile unit offering prosthetics support; near Doi Tung, Chiang Rai Province



HRH Princess Galyani Vadhana and orthopaedic surgeon Dr Direk Israngkul inspect prosthetic limb manufacturing at Sanam Luang

The Protheses Foundation exists today because of the compassion and concern shown by the late Princess Mother. After learning of the plight of poor and needy amputees, who found it difficult to access prosthetic services, the Princess Mother began thinking of a practical solution to their problems. It did not take long for Her Royal Highness to realise that by providing easy access to prosthetics, willing amputees would be able to find work to support themselves and their families and get on with their lives as valuable members of society.

The Protheses Foundation, a name chosen by the Princess Mother's daughter, the late Princess Galyani Vadhana, was established in Thailand's northern province of Chiang Mai, partly through the Princess Mother's initial donation of half-a-million baht US\$20,000 in 1992 along with additional funds raised from the sale of a private car willingly donated by HRH Princess Galyani Vadhana. Added to this were cash donations (in yen) from the Japanese public to help people in Thailand who had lost legs after stepping on landmines. With total seed money of approximately two million baht (US\$80,000) – available on condition that the interest alone was drawn down for constructing prosthetic limbs – the foundation was registered as a not-for-profit charity on August 17, 1992.





This “farmer” prosthetic leg is an innovation of the Prostheses Foundation

Hilltribe villagers take home their new artificial legs; Mae Salong, Chiang Rai Province

It is a sad fact of life that people lose limbs for a variety of tragic reasons such as diabetes, chronic ulcers, vehicle accidents and landmines from former conflicts. Even today, landmines remain dotted around Thailand’s border areas. In some cases people are born impaired; others suffer amputations following snake bites. Formerly, these victims used improvised wooden supports and other locally-acquired raw materials to help them get about, as official assistance was rarely available, if not totally inaccessible, to many.

In 1980, twelve years before the launch of the Prostheses Foundation, the only agency able to provide the necessary assistance was the Foundation for the Handicapped under the royal patronage of the Princess Mother. However, filing a request for an artificial leg was a protracted procedure frustrated by complicated rules and a long wait. Moreover, the quality of artificial legs, when available, left room for improvement. In contrast, the new foundation required only physical evidence for an amputee to get his or her artificial leg at no charge to the recipient.

The Prostheses Foundation of HRH the Princess Mother was founded primarily to help poor and needy amputees in Thailand’s remote, rural areas; those citizens who, because of their farming background, needed help to survive and make a living for themselves and their families. This led to a mobile workshop being established that could fashion prostheses on the spot, along with attendant personnel including physicians, technicians and volunteers. Kitted out with supplies essential for



“Homemade” prosthetic limbs!



These vehicles contain everything necessary to support a mobile workshop for manufacturing prosthetic limbs

manufacturing prosthetics, the mobile workshop truck travels around Thailand working to a prearranged schedule based upon orders and requests submitted by individual provinces. In general, it makes five to eight journeys a year, each time providing up to 200 prosthetic legs to help ease the hardship of amputees and the burden on government. Because of its growing popularity and increasing demand on the mobile unit, the Prostheses Foundation was obliged to consistently enhance its prosthetic equipment to ensure ease of use and effectiveness. In time its reputation transcended national borders: neighbouring countries including Lao PDR, Malaysia and Myanmar began filing requests for assistance. Fittingly, this led to the foundation being recognised in both the Malaysian Book of Records and the Guinness Book of World Records – records that helped give the foundation an international presence.

At the start, however, the operation could hardly be described as smooth, given that part of the foundation's essential workforce – skilled technicians – was volunteer-based. To deal with this challenge, alternative methods had to be identified, based solely on the availability of the foundation's raw materials and related equipment. This led to “BK” (below the knee) and “AK” (above the knee) models of prosthetics being prepared for use as training aids for non-prosthetists. Volunteers were able to follow theoretical and practical training replicating those who were professionally trained. Ironically, those who were once beneficiaries of the foundation now served as an excellent source of volunteer recruits.



Professionally trained volunteers



Some volunteers are themselves amputees



Workshop training for volunteers from Aceh Province, Indonesia

The training devices turned out to be of great use. Personnel certified as prosthetists with the mobile workshop could now replace those who found it difficult to fulfil their commitment as volunteers due to professional pressures. Moreover, the volunteers, through their own ability, could earn a living and support their families. On a psychological level, they tend to have a genuine understanding for those with whom they share a similar plight and take pride in the fact that their tangible contribution has made them valuable and eminent members of society. Similarly attributed personnel now serve the foundation in the mobile unit.

As a further service to amputees, the foundation is setting up small-scale workshops at community hospitals mostly at Thai border locations that can carry out repairs or provide replacement prosthetics. Such workshops help cut both costs and waiting time amputees face seeking help elsewhere. The foundation has readily available resources to equip 33 such workshops for the benefit of local amputees and help ease the burden on government departments.

In 2005, in the aftermath of the Asian tsunami during which a large number of people perished, and a great deal of property was destroyed or damaged, there were also many amputees requiring help, especially in the Indonesian province of Aceh. Thailand faced a similar predicament. Subsequently, the Mae Fah Luang Foundation requested the Prostheses Foundation of HRH the Princess Mother to arrange a mobile unit to provide prosthetic aids to amputees in Aceh. However, because of certain constraints, the Prostheses Foundation was unable to respond to the request. Instead it was suggested that Indonesia send to Thailand a group of eight amputees to undergo training for four months at the foundation. After completing the training, the group returned to Aceh complete with all necessary materials and equipment presented to Indonesia by the foundation to build a prosthetic workshop similar to those found in community hospitals in Thailand. The trained amputees were reportedly able to produce artificial limbs based on the foundation's model and thereby able to satisfy local demand to the best of their ability.



Burundi

In 2009, the Thailand International Development Cooperation Agency (TIDCA) asked the Prostheses Foundation to assist in establishing a prosthetics workshop for Burundi in Northeast Africa, which had no state-sponsored prosthetics workshops. Burundi also learned that Thailand had successfully established prosthetic workshops in rural community hospitals to help needy amputees. Accordingly, Burundi sent technicians to learn how to produce artificial limbs in Thailand. On return to their own country, Thailand subsequently donated prosthetic materials and equipment along with Thai technicians to help set up a prosthetics workshop in Burundi free-of-charge. Later, a representative of the government of Burundi officiated at the opening ceremony of the workshop. The technicians who had trained in Thailand demonstrated the process for making prosthetic limbs in the style of the Prostheses Foundation. Visitors attending the ceremony showed great satisfaction with the demonstration.

The setting up of a successful workshop in Burundi led to TIDCA, in 2010, requesting the foundation to help establish a prosthetics workshop in Senegal as, by now, the foundation had gained a reputation for great efficiency in providing prosthetic aids at low production costs. Then again, in 2013, the Royal Thai Embassy in Myanmar contacted the foundation with a request for a prosthetics workshop for the Myanmar government at the National Rehabilitation Hospital in Yangon. Further to this, the foundation also established a similar prosthetics workshop at the Bandar Utama Buddhist Society in Kuala Lumpur, Malaysia.

When requested, TIDCA and the Prostheses Foundation will work together to establish prosthetics workshops in other countries, for example Bangladesh and Bhutan.



Workshop in Senegal



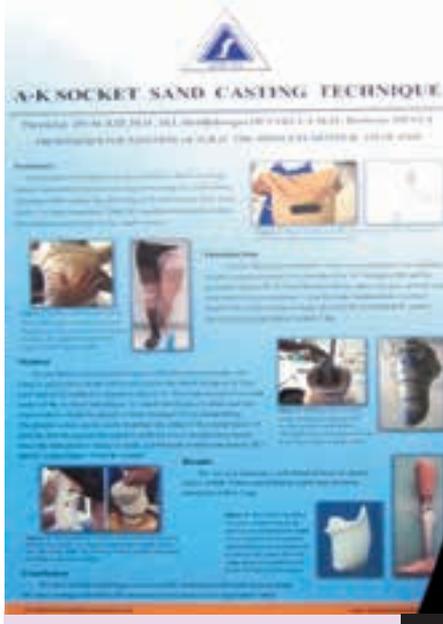
HRH the Princess Mother, HRH Princess Galyani Vadhana, and HRH Princess Maha Chakri Sirindhorn, current chairperson of the Prostheses Foundation

The one-of-a-kind prostheses charity left behind by the late Princess Mother and her daughter HRH the late Princess Galyani Vadhana has gone through several phases of technological development since its inception in 1992. Functioning as a not-for-profit organisation the foundation is ready and able to respond flexibly to the changes and obstacles commonplace in a developing country like Thailand. Much of its success is owed to its royal founders, clearly demonstrated through their good counsel and guidance, and from regular site visits.

The interest shown by the royal family is an inspiration to everyone involved in running the foundation. At present, HRH Princess Maha Chakri Sirindhorn serves as chairperson of the Prostheses Foundation of HRH the Princess Mother, inheriting the aspirations of HRH Princess Srinagarindra and HRH Princess Galyani Vadhana. Without this level of commitment from the royal family the foundation would not enjoy the success and acclaim it has won both at home and abroad to such an extent that foreign amputees make trips to Thailand specifically to receive prosthetic limbs. Its original founders may have passed away, but the foundation lives on, drawing inspiration from HRH Princess Maha Chakri Sirindhorn.



Dr Therdchai Jivacate explains to Princess Maha Chakri Sirindhorn the progressive stages for manufacturing a prosthetic limb



Presentation by the Prostheses Foundation at ISPO World Congress, Leipzig, Germany, May 2010

The foundation's effectiveness in manufacturing efficient and durable prostheses at low cost did not go unnoticed in the broader world of medicine. In recognition, the Prostheses Foundation was invited by the International Society of Prosthetics and Orthotics (ISPO) to be represented at the 13th ISPO World Congress held in Leipzig, Germany in May 2010 to share with an international audience the technological improvements pioneered in Thailand. From earlier days when plaster of Paris was used in the manufacturing process, today's prosthetic devices are made using the sand-casting method to make negative and positive moulds that give a perfect fit for amputees.

Apart from meeting the needs of human beings, the Prostheses Foundation has, from time to time, been called upon to lend its expertise in the animal world, initially through a call for help from the Elephant Hospital in Lampang. At the time, a seven-month-old baby elephant was being treated for a severely injured right foreleg after she had stepped on a landmine at the Thai-Myanmar border. The poor calf, three years old when the call for help came through, had only three legs to support her, hence the need for specialised help. The foundation responded by successfully fitting a strong and durable prosthetic device using the sand-casting method normally associated with humans. Following press reports on the success of this simple, effective and speedily-applied technology, more requests poured in from private owners of elephants (and other animals and birds) seeking similar services. It was a defining moment made possible by the vision and benevolence of the foundation's royal founders.

This elephant's prosthetic limb was provided by the Prostheses Foundation



Lose a limb and lose your livelihood!

If you lose a limb, do you also lose the ability to earn a living? It may seem a rhetorical question to some, but to those amputees who have lost limbs they know only too well that life going forward will be difficult and they may even lose their livelihood or at least the opportunity to earn a reasonable living for their families. An amputee and everyone in his or her family feel the pain.

In the years following the Vietnam War and other conflicts in Thailand's neighbouring countries, and even to the present day, many people continue to lose limbs after stepping on landmines. Farmers and children living along borders littered with unseen, unexploded ordnance appear to be most at risk. This startling situation, compounded by road accidents and other maladies such as snakebites or chronic, diabetic ulcers, account for people in Thailand and surrounding countries losing one or more of their limbs.

For many Thais, buying a modern prosthetic limb is prohibitively expensive but the high cost is not the only consideration. Acquiring prosthetics, which are generally available in urban centres, is difficult in remote, rural districts. Moreover, modern prosthetics are not designed for the rigours of country life confronting people on a daily basis in the hills and on the farms of Thailand.

Faced with such daunting challenges, disadvantaged people who lost limbs due to landmines, snake bites, and other forms of accidents, often, in the past, resorted to makeshift alternatives. For example, amputees would fashion their own substitute limbs from bamboo, bits of wood, leather and even plastic piping. The less fortunate were reduced to hobbling around on homemade crutches.



Waiting in line for a new prosthetic limb

Foundation established in Chiang Mai

In due course, HRH the late Princess Mother, a frequent visitor to remote parts of Thailand, became aware of the plight of poor and needy amputees and became greatly concerned. Her Royal Highness decided to intercede.

Police Major General Dr Chalernbongse Komarakul, a former physician to the Princess Mother and a member of the Prostheses Foundation, related the concerns expressed by Her Royal Highness at that time: “Her Royal Highness frequently

visited people in remote rural areas in almost all provinces in Thailand. She was aware of their difficulties and offered assistance to help ease their hardships to a certain extent. Later, she learnt that Associate Professor Dr Therdchai Jivacate, an orthopaedist at Chiang Mai University, had been successful in producing prosthetic limbs.”

“By chance,” Dr Chalernbongse explained, “Her Royal Highness became aware of Dr Therdchai Jivacate, a young orthopaedist who practised in Chiang Mai.”

A graduate of Chulalongkorn University’s Faculty of Medical Science, Dr Therdchai furthered his studies in rehabilitation medicine at Northwestern University in the United States before returning to Thailand to work in government service. Concerned about the high cost of imported prosthetics, he focused on using locally available materials as a substitute.



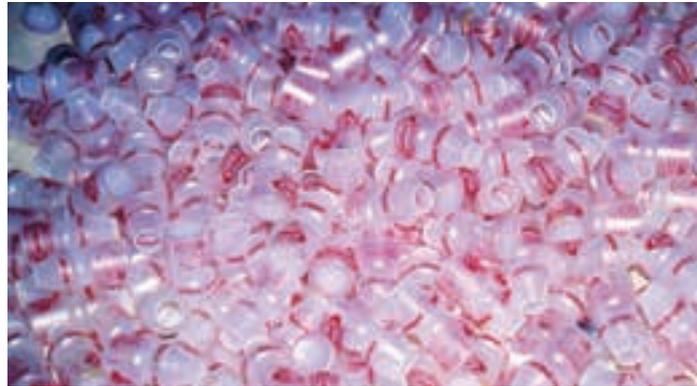
*HRH the Princess Mother with villagers
in rural parts of Doi Tung Province*

*Princess Galyani
visiting a mobile unit at
Nakhon Pathom*



Fully aware that those in need would find it difficult to afford imported prostheses, which at that time were made from polyester resin and wood and covered with plastic making them very heavy as well as expensive, Dr Therdchai resolved to find a way to help the poor. The doctor explained that the technology for making false legs had not changed for years, but they were cumbersome and the basic polyester-resin required for the socket and out-coating made them expensive. He wanted to find a way to make cheaper legs: “We started looking for an easily available type of plastic to replace polyester-resin. From our studies we found plastics called polystyrene that can be turned into liquid plastic using solvents from which we can make a socket.”

After experimenting with different plastics, Dr Therdchai’s team found that by adding a solvent or thinner or acetone, plastic objects can be easily liquefied and worked into different shapes. He decided to use small polystyrene bottles originally manufactured for drinking yogurt. It was found that after liquefaction, pink-coloured Yakult bottles became skin-like in colour, an interaction caused by the lettering on the bottles. The result was ideal for making prosthetics look more authentic.



After being made aware of Dr Therdchai’s discovery, Dr Chalermbongse contacted HRH the Princess Mother: “I arranged to call on Her Royal Highness carrying an artificial leg given to me by Dr Therdchai. I said to Her Royal Highness, ‘Dr Therdchai has some interesting invention to show you!’ The Princess Mother became quite interested when I showed her the prosthetic leg fashioned from recycled Yakult yogurt bottles,” he added.

Artificial limbs are manufactured from recycled polystyrene bottles and aluminium cans



The Princess Mother met often with amputees before the Prostheses Foundation was established



Nong Nut was fitted with her first prosthetic leg when she was only one year old

“Her Royal Highness asked me what the benefits were from using this kind of recycled material and I explained that the end product was both comfortable and inexpensive. The Princess Mother then asked me if there really were so many amputees and, if so, why didn’t they all have access to these less expensive prosthetics?”

Clearly impressed with the work carried out thus far by Dr Therdchai and his team on low cost, locally-manufactured prostheses, the Princess Mother decided to donate funds towards the project. In conjunction with her daughter, HRH the late Princess Galyani Vadhana, the Princess Mother proposed setting up a foundation that could further the research and development of lightweight, effective and durable prostheses; in effect to manufacture artificial limbs from inexpensive, locally-sourced, recyclable materials.

“The Princess Mother asked me if 500,000 baht would be sufficient to establish a foundation in Chiang Mai,” confided Dr Chalernbongse. “As it turned out,” he said, “Her Royal Highness Princess Galyani, the Princess Mother’s daughter, was offered several thousand baht for one of her cars.” The Princess Mother and Princess Galyani raised around 2,000,000 baht as seed money for the foundation, including donations from the people of Japan.

Doctor Chalernbongse went on to explain that Her Royal Highness the Princess Mother, in a compassionate and caring way, demonstrated her concern and desire to help alleviate human suffering “not just for Thais but for foreigners alike, by insisting that anyone could go to the Prostheses Foundation in Chiang Mai for an artificial limb.”

The doctor explained that when the Princess Mother started the foundation many remote villages were inaccessible by road; the only way in was by helicopter. “People in remote villages had no experience of modern medicine,” he recalled. “If someone lost a limb, chances were they would not be able to visit a big city to seek medical attention – or be able to afford it if they could make the journey. In that respect, the Prostheses Foundation was uniquely placed to generate funds along with volunteer medical staff to help those in great need.”



HRH Princess Galyani watching as an amputee tries on his prosthetic limb





Princess Galyani visiting amputees

Registered on August 17, 1992, the Protheses Foundation started business using an office at Chiang Mai University, a generous offer on the part of the university's Faculty of Medicine. Their Royal Highnesses the Princess Mother and Princess Galyani officiated as honorary chairman and chairman respectively. Some years later, the Royal Thai Army stepped in to provide the foundation with 7.2 rai (over one hectare) of land for a permanent office building, which Princess Galyani graciously opened on October 6, 2003.

Mindful of HRH the Princess Mother's request to contain costs by using materials available in Thailand, the foundation concentrated on recycling locally sourced plastic yogurt bottles. Dr Chalernbongse explained: "In the manufacturing process we use polyester resin that comes in liquid form. Originally, we experimented with different types of plastic until Dr Therdchai and his team discovered that recycled Yakult yoghurt bottles provided strong and durable plastic suited to our needs," he added.

Aware of the project, and after some consideration, His Majesty the King offered the foundation some useful suggestions. Concerned that the medical staff and technicians fabricating prosthetic limbs could contract health problems after inhaling toxic fumes (even becoming addicted to the thinners being used) the King counselled against the use of solvents to liquefy the plastic. His Majesty graciously intervened by requesting Thai companies cooperating in the process of breaking-down plastics to provide the foundation with polyester resin free of charge.



Constructing a prosthetic limb

Turning to the construction phase, Dr Chalermbongse explained the process for producing the skeleton of an artificial limb. “We recycle aluminium pull-rings used on cans of drinks; not the can itself because of the paint. I can honestly say that recycling has proven to be excellent PR for the foundation.” The doctor stressed the involvement of the international community in collecting aluminium. “It may not be widely known,” he said, “but passengers travelling on the Cunard flagship Queen Mary 2, which docks at Thai ports during her round-the-world voyages, are helping the foundation by saving their aluminium pull-rings for the foundation. In addition to helping us by separating waste into receptacles on board ship, they are also responding to global needs to recycle reusable materials.”

The Prostheses Foundation relies heavily on recycled material



Free prostheses for the poor and needy

The Princess Mother's intention in setting up the Prosthesis Foundation was to provide free prostheses for poor and needy amputees regardless of nationality or religion. Indeed, the foundation manufactures parts for prosthetic limbs for other workshops free of charge to enable them to produce and repair the same types of prostheses as the foundation. To keep abreast with scientific advancement, the foundation conducts its own research and development, with assistance from the public and private sectors in terms of raw materials, some of which are recycled. Contributions enable the foundation to provide aid to the physically challenged helping them to lead normal lives on a daily basis – not only prosthetic limbs but canes and walkers made from recycled materials, all offered free of charge. However, a major logistical issue that continues to challenge the foundation is the diverse spread of amputees around Thailand, a country with a land area the size of France.



These hip prostheses were fitted in four days, free of charge



VIPs attending a ceremony during which four children received new prosthetic legs

Mobile workshops and volunteers

To address the problem of diversity, the foundation progressively introduced mobile workshops specifically for amputees in remote border areas of Thailand. Field clinics, staffed by volunteer teams of doctors and skilled technicians, made it possible for those in need to have access to prosthetic limbs. Originally, two trucks carried the volunteers and their equipment, “and we only required lights for working after dark,” explained Dr Chalernbongse. “We do not discriminate against those coming to us, we request little information about our patients,” the doctor said. “On one occasion,” he explained, “we had some poor people from the Wa hilltribe come to us and all we asked for was a first name.”

Inside the mobile workshop, volunteers record each patient’s information and establish the cause of their handicap before sending them to a doctor for a medical check-up. As soon as the doctor issues orders for making artificial limbs for patients, technicians begin by making a cast of patients’ stumps before moulding plastic limbs to fit each of the amputees. The prosthetics are tested and adjusted until patients are able to put on their prosthetic legs and walk comfortably. When the doctor is satisfied, the technicians continue with the production process until the prosthetic legs are finished. Finally, amputees are asked to return after six days to receive their prosthetic limbs free-of-charge.

In 2006, Ms Usa Lamsam, a Thai mother and housewife holding a Masters Degree in International Relations from the Fletcher School of Law and Diplomacy at Tufts University in the United States, became inspired to volunteer her services to the foundation. Aware, like many others, that the Princess Mother and Princess Galyani had been travelling around Thailand helping people in remote areas, she decided to make some form of charitable contribution: not a cash donation; she wanted to donate her time as a volunteer.

Without any technical knowledge, Ms Usa wondered how she might help. It was Dr Chalernbongse, she said, who “...guaranteed I would do more than I thought!” Taking his advice, she went with a mobile unit to northeastern Thailand.



Volunteers are welcome at the Prostheses Foundation



An amputee being attended to by a skilled technician

“I went to Nakhon Phanom Province close to the River Mekong with no idea at all as to what I would be doing. Doctor Chalernbongse put me in the registration section. First I had to learn a few medical terms like BK, which means below the knee, and AK, which means above the knee.” Armed with the patients’ other details, obtained by Ms Usa through interviews, the appropriate technician could be assigned to each individual case.

“This didn’t just apply to local Thai people,” Ms Usa said, “people were coming across the Mekong from Lao and receiving free prostheses from the foundation’s mobile unit – with just a four-day wait.”

She explained that she had the same experience in Mae Sot on the Thai-Myanmar border after interviewing Burmese and Karen amputees. “For me it was a life-changing experience. I felt I was giving more than just money...I just had to look at the patients to see the hope reflected in their eyes once they could walk. I found myself telling my family and close-circle of friends about my experiences. After that, every time I went with the mobile unit I carried cash donations from many kind people”,said Ms Usa.

These opportunities, impossible without the help of the foundation, had a profound effect on her life. She explained: “I met one old man who had never had a prosthetic leg. He tried to make his own with bamboo. Then there was a lady who had never been out of her house for sixteen years; she was fitted with a prosthetic leg and her life changed,” Ms Usa said.

Recycled panty hose also has a use for covering amputees’ stumps before making sand and plaster moulds. “I wash and take thousands of them to the foundation” Ms Usa said. “We can use only one panty hose per patient, but I get many from within my very large family.” She said she had learned from a doctor at the foundation that Thai Airways’ cabin attendants also help the Prostheses Foundation by contributing used panty hose for recycling.

Since its inception, the Prostheses Foundation has manufactured more than 50,000 limbs for more than 30,000 people, all of whom received new limbs free of charge.





The foundation's prosthetic limbs are strong and durable

What makes a good prosthesis

The foundation considers an effective prosthesis to be one that is not only comfortable and capable of supporting the wearer's body weight but is also able to withstand the rigours of daily use in demanding circumstances such as on farms and in the hills of Thailand's rural areas.

The Princess Mother, who had first-hand experience of the rugged conditions faced by those working in the agricultural sector, and the challenges levelled at the poor and needy in rural areas of Thailand, suggested that prosthetic limbs should be sturdy in design and constructed, where possible, from locally-sourced materials to keep down costs and reduce import charges. Responding to the wishes of Her Royal Highness, the foundation designed and produced a custom-made "farmer's leg" prosthetic which is light and comfortable to wear. This low-cost farmer leg is practical for rice field usage; its non-slip characteristics mean it can be used in water. More over, it is easily cleaned to keep it in good condition.

"In the past, some artificial limbs were made of wood," observed Dr Chalernbongse, "and were just like peg-legs. I recall one man who attached a metal cap to the lower part of the socket to make it last longer. Today, we can make adjustable prosthetics that enable the owner to walk naturally," he added.

Practicality remains the overriding requirement, and while complying with HRH the Princess Mother's guidance to manufacture limbs available for everyone and everyday usage, a prosthetic foot was developed especially for the harsh conditions experienced in hilly, rural areas. A prosthetic foot developed by the foundation is strong, durable and provides a firm contact with the ground. Importantly, it is inexpensive, acid-and alkaline-resistant and suitable for use in water, mud, animal pens and even for climbing trees or mountains. These prosthetic aids are provided free of charge to impoverished farmers.

The Foundation's prostheses

Five different types of prostheses are required to meet the various needs of amputees. A Syme prosthesis, for example, is used for amputations at ankle level. This entails applying a plastic covering for the stump from knee to ankle joint. For amputations just below the knee, where the knee is still intact, the stump connects to a socket that has sufficient ventilation to reduce the risk of fungal infection. Unlike some prostheses, the socket connection encloses the knee making straps unnecessary.

Unlike the custom-made prosthetic feet for farmers, a standard prosthetic foot designed by the foundation looks and feels like a real one. The heel is spongy, which helps lessen the impact when the wearer's heel strikes the ground. It also provides good "push-off" power, conserving energy and making it possible for amputees to walk further without tiring.

Other forms of prostheses provided by the foundation include knee disarticulation prostheses for those whose amputation is through the knee joint; an above-the-knee prosthesis, and hip disarticulation prostheses for amputations at the hip joint.



Applying resin to achieve a natural skin colour

Development of prosthetic technology

Her Royal Highness the Princess Mother's desire to produce locally-manufactured prostheses and make them widely available at no cost to poor and deprived people placed quite a demand on the foundation. To maintain a steady supply of prostheses, the foundation had to review its manufacturing techniques to speed up the process, without impairing quality. Today, the foundation uses the sand-casting method to produce prosthetic limbs and can produce prostheses for around one hundred to three hundred clients per visit. For every visit foundation staff must make sure a prosthetic leg is a perfect fit for each amputee and that the wearer can walk free from pain. This improved process means the foundation can complete below-the-knee prostheses in a single day compared to three-to-four weeks in the past – without sacrificing quality. Team members are justly proud of their achievements and efficiency and, as Dr Chalermpongse pointed out “we now hold the Guinness Book World Record for manufacturing the highest number of prosthetic limbs in a ten-day period...664 prosthetic limbs for 646 people from July 16 to 26, 2006!”

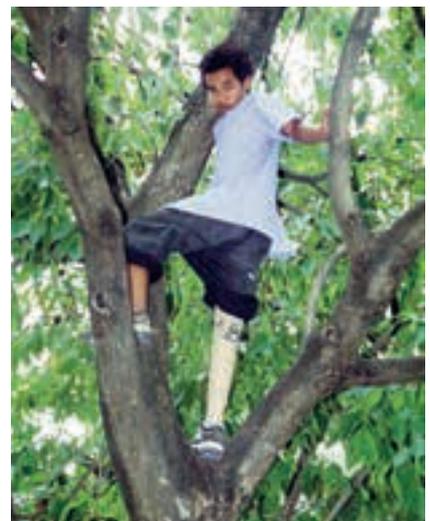


Production technique

Manufacturing a prosthetic limb at the foundation begins with the socket. This entails making a mould of the stump. After placing two plastic bags over the stump the air between them is sucked out, which causes the plastic to harden into the shape of the stump. A “negative mould” is then made using sand, from which it is possible to make a “positive mould” using plaster.

The positive mould creates a plastic socket for the stump that gives a perfectly comfortable fit for the amputee. This may appear to some observers to be an art form but the manufacture of artificial limbs requires a working knowledge of anatomy, physiology, mechanics, biomechanics and material sciences. Over a period of time, poorly-made artificial limbs can cause further damage to physically challenged people. On the other hand, a properly constructed prosthesis is durable and can give the wearer many years of service. These days, maintaining prosthetics – which normally means replacing the foot or straps – can be undertaken at local hospitals.

Referring to support received from hospitals, Dr Chalermpongse said: “At the onset, we used a lot of volunteers from hospitals but numbers gradually declined because of the hospitals’ own heavy workload. So we started using handicapped volunteers; less-educated people in the main who had to memorize medical terms for different parts of the arms and legs. But nowadays,” he continued, “nearly thirty percent of our volunteers are drawn from the ranks of amputees.”



The cost of a prosthesis

To begin with, the foundation used Yakult bottles in the manufacturing process. But after His Majesty the King had cautioned against the use of solvents that could result in the vapour affecting both the manufacturer and wearer of the prosthetic limb, polyester-resin was substituted. This did increase the cost of a prosthetic limb from around 700 to 1,500 baht (about US\$47 in 2010), but was still cheaper than importing prosthetics into Thailand.

The doctor explained that each component manufactured by the foundation is suitable for wear in a tropical climate. An imported prosthesis, he said, can cost between 1,500 and 20,000 baht (\$470-\$625). Sceptics may challenge the efficacy of a low-cost prosthesis manufactured by the foundation, perhaps claiming it is bound to wear out faster than the more expensive imported varieties. Scientific testing does not support that view. Tests conducted by the Sirindhorn National Medical Rehabilitation Centre found that a locally-constructed prosthetic foot can function for up to one million steps, which is sufficient for most people.

However, there are start-up costs associated with a project of this nature, mainly in acquiring basic equipment. For example, an infrared oven, to warm and soften plastic to make it pliable to mould and shape, costs around 50,000 baht (\$1,550). Equipment to fashion a plastic stump costs in the region of 25,000 baht (\$780) compared with 300,000 baht (\$9,400) for imported equipment. And a laser alignment machine costs 1,500 baht (\$45) against 90,000 baht (\$2,800) for an imported machine.

Apart from artificial limbs, the foundation produces forearm crutches for amputees who do not yet have a prosthetic limb; walkers for elderly people who have never used or received prostheses, and reliable, old-fashioned walking sticks.

Doctor Chalermpongse emphasised that costs borne by the foundation are covered by public and private donations. Amputees, in all cases, receive their prosthetic limbs free of charge.

Note: \$ = 32 Thai baht in 2014



Dr Therdchai Jivacate invented this positive alignment machine



Infrared ovens

International contributions

Since its inception, the foundation has, to date, held 110 mobile workshops, including some in Malaysia, Lao PDR and Myanmar. On Thai territory, bordering Myanmar, Lao and Cambodia, the foundation established permanent satellite workshops to make artificial limbs on site. In some cases, technicians trained by the foundation are themselves amputees.

Supplementary activities of the foundation have included organising artificial-limb workshops in Aceh, Indonesia and training prostheses technicians from neighbouring countries and others further afield. For example, a request was received from the Republic of Burundi in October 2009 for the foundation to train technicians to make and repair prosthetic limbs. Even though this landlocked African country had suffered years of civil war, with many antagonists sustaining wounds and amputations, there were no skilled workers able to make prosthetic limbs locally.

By training people from other countries, the kindness and benevolence of Their Royal Highnesses the Princess Mother and Princess Galyani has benefitted all amputees without fear or favour and regardless of nationality or religion. The foundation's work on the international front clearly demonstrates the founders' desire to make prostheses available to anyone in need irrespective of their ethnicity or religious beliefs.



The foundation organises workshops and training for overseas visitors





Briton Ian Reid obtained his replacement prosthetic leg from the foundation

Another example of international co-operation on the part of the foundation concerns the case of Mr Ian Reid, a Briton now resident in Thailand, who lost a leg in a car accident. Initially, he received a prosthetic limb from a hospital in the UK, but it proved problematical. After returning to Thailand he complained: “I was in some discomfort caused by my original prosthesis from the UK. I thought about what to do. I measured the convenience of being in Thailand against insufficient funds to return to the UK for a replacement and decided to have it replaced in Thailand,” he said.

At the time, Mr Reid said he was not aware of the existence of the Prostheses Foundation: “A Thai friend, who was keen to help me, introduced me to the foundation. As I was in such pain with my UK prosthesis, I was willing to try any new idea,” he added.

“I thought about it but I didn’t go to the foundation in Chiang Mai. The foundation had an annual itinerary to visit different provinces in Thailand and I met them on one of their visits to Aranyaprathet,” he explained.

“They looked into my problem and said they could make a new leg for me that would be much better and lighter,” he said. “They reassured me I would soon be walking again like a normal person. At first I took this

with a grain of salt because of my disappointment with my previous leg from the UK,” he added.

“However, not only was my new leg excellent in every way, I had the added honour of receiving it from Princess Galyani herself. I was the only foreigner present at the event,” he recalled. “The prosthetic leg was made for me on site in Aranyaprathet in less than thirty minutes. It was the first time I was able to walk ‘normally’ after many years. It was wonderful!”



Mr Reid explained how impressed he was with the support he received: “I was lucky to be taken care of by Dr Direk Israngkul who I understood to be a senior medical researcher and developer in Thai prosthetics. He instilled confidence in me from our first meeting,” Mr Reid said. “Obviously he had years of experience in his field and explained many things to me personally.”

In another case demonstrating the international aspects of the foundation, Mr John de Ritter, also a British national, received a new prosthetic limb in Thailand. After consulting with Dr Chalernbongse, Mr de Ritter discarded his ill-fitting prosthetic from the UK for a new, comfortable prosthetic from the Prostheses Foundation.

Mr John de Ritter with his UK-made prosthetic leg (left) and his new one from the foundation (right)



Prosthetic limbs for animals

With years of experience making prostheses for people, the foundation met another challenge on July 5, 2009 when it was asked to provide an artificial leg for a baby elephant. Mosha, just seven months old at the time, lost her right foreleg after stepping on a landmine in Myanmar. The wound took two years to heal before an artificial leg could be fitted. The replacement limb was provided by a team from the foundation using the method of sand-casting a negative mould and then matching it with a conventional plaster-cast mould to create a strong, durable replacement.

Following a successful refit, Mosha could once again walk, run and play on her artificial leg after recuperating at the Elephant Hospital in Lampang province in northern Thailand.

Other animals, even birds, have since benefitted from artificial limbs provided under the auspices of the Prostheses Foundation.



Mosha lost her right foreleg after stepping on a landmine



Support for the foundation

The initiative displayed by HRH the Princess Mother in setting up and supporting the Prostheses Foundation under Royal Patronage was the first important step towards alleviating the misery of many people in Thailand, and of people from abroad. Physically challenged people, who were born without a limb or lost one during life, were given cause for hope. With ingenuity and foresight on the part of the foundation, along with donations from the public and private sectors, prosthetic technology has advanced in Thailand to benefit thousands of people who might otherwise have been denied help. And by using locally-sourced materials, the foundation has been able to supply Thais and foreigners alike with free limbs, giving many poor and needy people a new lease in life.

Anyone and everyone is welcome to make a donation to the foundation and play an active part in supporting the vision of Their Royal Highnesses the Princess Mother and Princess Galyani that all amputees should have access to artificial legs. For more information, please visit the Prostheses Foundation website (www.prosthesesfoundation.or.th) or the National Identity Foundation website (www.nif-tidthai.org).

Continued, generous support from the public and private sectors of business and others in the international community, means the foundation is well-placed to expand its essential work and fulfil a worthy goal set down by HRH the late Princess Mother to make high-quality prosthetics available to everyone in need, as soon as possible.





The Prince Mahidol Award





THE PRINCE MAHIDOL AWARD

Award foundation

In commemoration of the centennial birthday anniversary in 1992 of His Royal Highness Prince Mahidol of Songkla, His Majesty King Bhumibol Adulyadej granted permission to establish the Prince Mahidol Award to be administered under the auspices of the Prince Mahidol Award Foundation under the Royal Patronage.

Established in accordance with a proposal put forward by the Faculty of Medicine Siriraj Hospital, Mahidol University, the foundation honours His Royal Highness and his exceptional contribution as “The Father of Modern Medicine and Public Health of Thailand”. Each year, the Prince Mahidol Award is conferred upon individuals or entities that have demonstrably contributed to the advancement of medical and public health services in the world.

Today, the offices of the foundation can still be found on the second floor of the Mahidol-Bumpen Building in Siriraj Hospital, Bangkok.



*The success is not in
the learning, but in
its application to the
benefit of mankind.
M. Songkla*



King Chulalongkorn and sons: Prince Mahidol (left), Prince Chudhadhuj (standing) and Prince Asdang, 1905



Prince Mahidol in his childhood days

The formative years

A son of Their Majesties King Chulalongkorn (Rama V) and Queen Savang Vadhana, Prince Mahidol was born on January 1, 1892. It was customary for King Chulalongkorn to send his sons to study in Europe – usually when they were around thirteen years old and deemed to be in good health. In keeping with tradition, Prince Mahidol set off for London in 1905 accompanied by two other princes. Prince Mahidol spent a short while at the Thai embassy before staying at the family home of Mr Colchester-Wemyss in the English countryside. It was there that Prince Mahidol and his companion Prince Chudhadhuj would refine their knowledge of the English language.

Prince Mahidol displayed a keen interest in art, particularly drawing and painting, with indications at just thirteen years of age that art could be his career path of choice. In a written report to King Chulalongkorn, Mr Colchester-Wemyss spoke of Prince Mahidol's artistic talents stating "...it is more than probable that he may one day become a brilliant artist..."

His Royal Highness went on to study at Harrow but after a year and a half he was enrolled into the Royal Prussian Military Preparatory College at Potsdam, Germany, according to the wishes of his father. He went on to the Imperial Military Academy at Groß Lichterfelde in Berlin to further his army military education remaining there until 1911.



Prince Mahidol hand-coloured these postcards sent from England to his sister Princess Valai and his mother Queen Savang, 1905



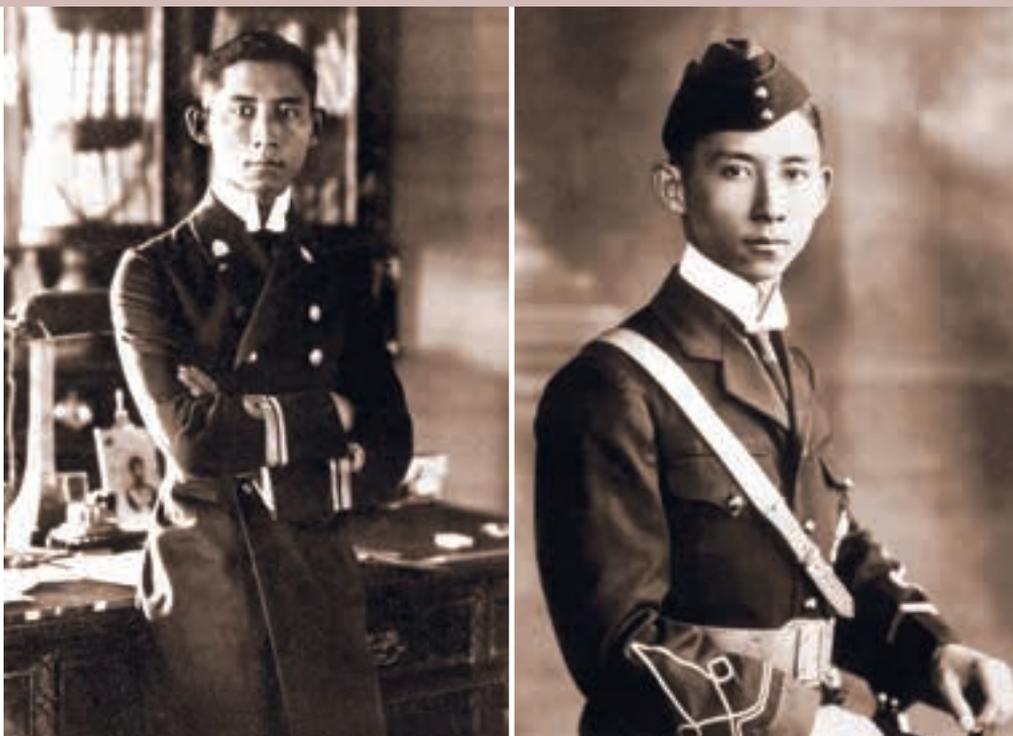
Prince Mahidol of Songkla in his formative years



HRH Prince Mahidol of Songkla saw military service



The Prince during the ceremony of cutting the top-knot, 1903



The Prince enrolled for army and naval service in Germany and Siam (later Thailand)

The Prince's half-brother King Vajiravudh encouraged him to enter the Mürwik Imperial German Naval Academy at Flensburg where he studied until 1914. Whilst there, the Prince won a competition in submarine design demonstrating his architectural and artistic talent.

Prince Mahidol's naval service in Germany was brief however; he was instructed by King Vajiravudh to return to Thailand at the outbreak of World War I in 1914 and became a lieutenant in the Royal Siam (now Thai) Navy. He went on to serve from 1915 to 1916 as a senior (today first) lieutenant.

A crucially important turning point in Prince Mahidol's early life – and that of the Thai nation – occurred when he resigned from the Royal Thai Navy (with the king's permission) to pursue a career as a civilian. The Prince's decision had a significant impact nationally: Thailand would later benefit from Prince Mahidol's enduring legacy for having advanced higher education in the Kingdom particularly in terms of science, public health, medicine, nursing, and medical research. Hence, in June 1916 His Royal Highness left Thailand for the United States, sailing via the Pacific Ocean, to study medicine. Even if he had wished or intended to take up studies in a European country at that time it was not an option; Atlantic Ocean voyages were suspended during the war.

Prince Mahidol's inherent love of arts and his dedication to education and scientific achievement, coupled with a sense of discipline gained during military service, were significant traits that would be passed on to His Royal Highness's own three children.



A career change to medicine and public health

It was Prince Mahidol's half-brother and childhood friend Prince Rangsit of Jainad who played an important role in Prince Mahidol's latent interest in medicine and public health.

At the time, Prince Rangsit was director of the Royal Medical College at Siriraj Hospital in Bangkok. In those days, medical and public health education in Thailand was in desperate need of attention as Prince Mahidol was about to learn. Domestic medical services lagged behind international standards. Moreover, the Royal Medical College and Siriraj Hospital were small, overcrowded, lacked funding and staff, and were generally ill-equipped.

Accompanied by Prince Rangsit, Prince Mahidol took a tour of the hospital and was taken aback by what he saw. Noticing Prince Mahidol's shocked reaction Prince Rangsit was prompted to enquire if his half-brother would care to intercede in an attempt to bring about improvements. Lacking any knowledge of medicine whatsoever, Prince Mahidol was at first reluctant. But, after a few days reconsidering the state of the hospital, and the needs of the patients, he not only voiced his wholehearted support, but also his intention to study medicine and public health.

Subsequently, the Prince went to the American state of Massachusetts. At first he did not enrol in medical school but studied as a public health officer. At that time, the public health course at premedical school followed the same syllabus as the first year of health officer. In the second year the Prince studied medicine at Harvard

Medical School to complete a pre-clinical course in two years then reverted to public health for another year. One year stretched into two because the Prince had to take an enforced break to attend the cremation of his aunt Queen Saovabha. In 1921, Prince Mahidol received his Certificate in Public Health (CPH) from MIT and Harvard School of Public Health, today known as Harvard School of Public Health. Had he not had to return to Thailand, the Prince would have received his CPH a year earlier.



*Prince Mahidol
of Songkla in
full dress*

Before leaving Thailand for the United States, Prince Mahidol had requested Prince Rangsit to help him select two medical students and two nursing students to send on scholarships to the United States. The Prince announced his intention to fund the medical students, while his mother, Queen Savang Vadhana, would fund the nursing students. One of the students, Miss Sangwan Talabhat, was destined to marry Prince Mahidol.

A year or so after their marriage, Prince Mahidol Adulyadej received his CPH. Miss Sangwan was given the title Mom Sangwan Mahidol na Ayudhya and, ultimately, became HRH Princess Srinagarindra the Princess Mother.

Following his studies, and a short break in Edinburgh, Scotland, Prince Mahidol represented the Royal Thai Government in talks with the Rockefeller Foundation. At that time, the foundation was offering financial and technical support to upgrade medical and public health education in Thailand to America's standards. At first the foundation agreed to help upgrade the medical curriculum at Siriraj Hospital but it was discovered, within the first year, that existing medical facilities could not support an enhanced curriculum; medical and nursing services would also have to be upgraded. To address this, the foundation set about sourcing six professors (medical university teachers) to reconstitute the most important part of the medical curriculum. One of these foreign professors would go on to be Director of Studies, a role undertaken by Dr A.G. Ellis who left his post as professor, head of pathology at Jefferson Medical College in Philadelphia. Subsequently, Dr Ellis was appointed by His Majesty the King to become Dean of the Faculty of Medicine and Siriraj Hospital.



*HRH Prince Mahidol of Songkla with
HRH the Princess Mother*



Although lacking sufficient funds, the Royal Thai Government knew that Siriraj Hospital had to be rebuilt. And, over time, new buildings were added to the hospital complex using donations given by Prince Mahidol, the Rockefeller Foundation, and other members of the royal family – each contributing thirty percent. The Royal Thai Government provided the remaining ten percent.

During the time the foreign professors attended Siriraj Hospital, a committee jointly established by the Rockefeller Foundation and the Royal Thai Government selected Thais to be trained in the United States to what might be described as “Dr. Ellis’s standards”. Once again, Prince Mahidol donated his personal funds, this time to send Thai students to study abroad to become teachers of basic science and medical science disciplines.

On the domestic front, family duties ensued and Prince Mahidol and Mom Sangwan became the proud parents of three children. Their first child, Princess Galyani Vadhana, was born in London in 1923. That same year, Prince Mahidol returned to Thailand to assume the position of director-general of the University Department in the Ministry of Education. The Prince supplemented his administrative duties at the ministry by teaching pre-clinical medical students at the Faculty of Arts and Science, Chulalongkorn University. Prince Mahidol taught biology and history using course notes that he meticulously prepared before taking each class. It can be seen from the Prince Mahidol’s personal notes, which contain detailed, draughtsman-like drawings of the human anatomy, that he had an innate artistic talent.



The Prince holding his first child, HRH Princess Galyani Vadhana, born in London in 1923



Prince Mahidol used his meticulous course notes to teach students

Prince Mahidol (middle row, far right) seated among professors and medical students



Before returning to his alma mater Harvard University, Prince Mahidol went to Heidelberg, Germany, in 1925 for a health check, after which doctors agreed the Prince was well enough to continue his studies at Harvard. That same year his first son Prince Ananda Mahidol was born. Two years later, the Prince's youngest son, Prince Bhumibol Adulyadej, was born in Cambridge, Massachusetts. Significantly both of Prince Mahidol's sons would later accede to the throne of Thailand as King Ananda Mahidol, Rama VIII, and King Bhumibol Adulyadej, Rama IX, respectively.

By this time, Prince Mahidol was into his fourth year of medical studies at Harvard. However, his health had begun to deteriorate. He was diagnosed with a kidney disease that caused him to be admitted to hospital for a month. After being discharged, the Prince was able to take his final exams receiving his M.D. *cum laude* six months after the birth of Prince Bhumibol Adulyadej. He was congratulated by the Dean of Harvard who said at the time that Prince Mahidol's grades contained many A's.

During the next month, Prince Mahidol made plans to return to Thailand after first writing a letter back home stating his preference to stay on in the United States for another year to study paediatrics. But it was not to be: The Prince fell ill with stomach pains and was admitted to hospital for an appendectomy. On the day his fellow students collected their degrees, Prince Mahidol was recovering from the operation.

Extremely keen to improve medicine and public health in Thailand, one of the first things Prince Mahidol did on his return home was to establish scholarships for students in the fields of medicine, nursing and public health.

The Prince planned to return to Siriraj Hospital in 1928 as a resident in paediatrics. However, in view of his enhanced royal status, resident duties were deemed beneath his rank. Rather than insisting on having his own way, which he could have done, Prince Mahidol complied out of respect for the sensitivities involved. Undeterred, the Prince chose to work at McCormick Hospital in Chiang Mai, which was run by Presbyterian missionaries and where he laboured day and night as a resident doctor. The Prince was a popular figure: hospital patients affectionately addressed him as *Mor Chao Fa* (Doctor Prince).



Prince Mahidol holding Princess Galyani and Prince Ananda



Part of Siriraj Hospital inaugurated by King Rama VII in 1928



The McCormick Hospital in Chiang Mai, 1926

Later, and just three weeks after Prince Mahidol started work in Chiang Mai, he was called to attend the funeral of his uncle in Bangkok. Unfortunately, Prince Mahidol's career in medicine and public health was cut short. He became ill with an amoebic liver abscess and never returned to the hospital in the North. Prince Mahidol passed away on September 24, 1929 at Sra Pathum Palace in Bangkok a few months short of his thirty-eighth birthday.



Prince Mahidol (seated second from right) was honoured with the title “Father of Modern Medicine and Public Health of Thailand”

A lasting contribution to humanity

Prince Mahidol had already contributed considerable sums from his own funds to further the cause of medicine and public health in Thailand. Under his guidance, six talented students were despatched to England to study physics, chemistry and biology. On their return, they formed the nucleus of a well-qualified teaching staff in basic sciences – something previously lacking in Thailand. Special emphasis was placed on medical education and research, public health issues and nursing. His

Royal Highness's initiative and hard work made a remarkable difference to Thailand's approach to medicine and public health issues - so significant that he was subsequently honoured with the title “Father of Modern Medicine and Public Health of Thailand”.

The Prince's legacy lives on in Thailand today and reaches beyond the country's borders. Many students sent overseas under scholarships became leaders in modern medicine in Thailand. Some are regarded as great teachers; others helped establish new medical schools and universities. The Royal Medical College, for example, became known as the Faculty of Medicine Siriraj Hospital and was a key faculty of the University of Medical Sciences when it was founded in 1943 and renamed by royal decree in 1969 as Mahidol University.



Rewarding human endeavour

It was to commemorate the centennial birthday anniversary in 1992 of HRH Prince Mahidol of Songkla, that His Majesty King Bhumibol Adulyadej granted permission to establish the Prince Mahidol Award.

Acknowledging acts of humanitarianism and concern for mankind demonstrated by Prince Mahidol, the Prince Mahidol Award recognises men and women from around the world for their work in helping fellow humans. In his short life, Prince Mahidol worked hard to promote education and understanding in medicine and public health. The Prince's legacy, now embodied in an internationally acclaimed award, has helped stimulate worldwide performance in medicine for the benefit of mankind and improve the global well-being of people through improved public health, together fulfilling the vision of His Royal Highness and the objectives of the Prince Mahidol Award Foundation.

Secretary general of the foundation, Dr Supat Vanichakarn, spoke of Prince Mahidol's desire to improve medicine and health services in Thailand: "His Royal Highness thought only about how to help his country. I recall Princess Galyani Vadhana [Prince Mahidol's daughter and sister to His Majesty King Bhumibol] saying it was all about taking responsibility...and taking responsibility is something you should not have to think about...it should be natural, Her Royal Highness said."

In Dr Supat's opinion, this willingness to accept responsibility is evident in many members of Thailand's royal family: "Prince Mahidol was a little bit older than his wife [HRH the Princess Mother] and she was clearly influenced – even inspired – by her husband to show compassion towards people in need. And over time, the Princess Mother instilled the same sense of responsibility in her own children."

The secretary general's comments echo those made by many prominent people in Thailand, in particular scholars and practitioners in the service of HRH the late Princess Mother, and those who are still actively engaged in developing and managing royal development projects. Relying on insight and observations related by some of Thailand's foremost figures, examples of which appear in each of the royal activities portrayed in this book, it is not difficult to draw a parallel between the compassion and altruism shown by HRH Prince Mahidol and HRH Princess Srinagarindra the Princess Mother, and that displayed by His Majesty the King out of concern for the well-being of the Thai people.

Even during the early stages of the young Prince Bhumibol's education in Switzerland his mother had instilled in him and his siblings the importance of being frugal. Like any concerned parent, the Princess Mother taught her three children the value of money and the value of life. At a young age, they became motivated to emulate their mother's fiscal prudence. Prince Bhumibol, along with



Consideration and self-sacrifice characterised by HRH Prince Mahidol became hallmarks of HRH the Princess Mother and His Majesty King Bhumibol

his brother and sister, set aside a portion of their pocket money each week. At the end of each month, and after a family discussion, the accumulated amount was willingly handed over to a foundation, charity, or some other worthy cause.

Her Royal Highness raised her children in line with the same principles followed by Prince Mahidol. As HRH Princess Galyani Vadhana once remarked: “In our family, a sense of responsibility was a given; an ingrained nature of our upbringing. The first thing we were taught was ‘What could we do for the country?’”

From these early-learning days, and throughout his life, His Majesty King Bhumibol has shunned extravagance in favour of prudence. Adopting a cautious and practical approach to matters, with patience and commitment to the job at hand as a working monarch, best characterises His Majesty’s approach to life.

The subsequent “career path” followed by His Majesty – a journey during which the King has excelled in the arts, in scientific endeavours, and in sporting events – points to the King’s balanced and well-rounded upbringing. It was because of his mother’s love of photography and cinematography, for example, that the young Prince Bhumibol was inspired to take up photography at the tender age of eight. The young prince also displayed a love of construction and, at times, could be found carving wooden glider planes, or fabricating his own electric motors.

Whether in the pursuit of photography, music, painting, sailing, water-skiing or playing badminton, the King was self-motivated to meet the high standards he set for himself. In music he excelled as a composer, arranger and musician. As a sailor he not only carpentered his own, wooden-framed sailing dinghies but went on to win a gold medal for Thailand in 1967 at the Fourth Southeast Asian Peninsular Games. At the time, His Majesty was accompanied by his daughter HRH Princess Ubol Ratana – also a gold medal winner.

Honoured by world-renowned entities for a life’s work as a “developer king” and “humanitarian”, His Majesty proved, through a lifetime of achievements that it is not necessary to scale the heights of academia to achieve pre-eminence. In a way, His Majesty embodies his own father’s assertion that *“the success is not in the learning, but in its application to the benefit of mankind”*.

Ultimately however, it was the uninhibited compassion and concern for the poor and needy displayed by His Majesty’s caring parents that left the greatest impression on Thailand’s multitalented King. And it was to honour, in perpetuity, the humanitarianism of Prince Mahidol of Songkla that His Majesty granted permission to establish the Prince Mahidol Award.

Today, the Prince Mahidol Award is recognised as an international reward for human endeavour.



HRH the Princess Mother showed great concern towards the poor and needy



The Prince Mahidol Award recognises outstanding work in the fields of medicine for the benefit of mankind and in public health for the wellbeing of people

Nominations for the award

The Prince Mahidol Award is presented to individuals or institutions in one of two categories: In medicine for an outstanding performance and/or research in the field of medicine for the benefit of mankind; or in public health, for an outstanding contribution in the field of public health for the sake of the wellbeing of the people. Both categories were established in commemoration of HRH Prince Mahidol's graduation with Doctor of Medicine (*cum laude*) and Certificate of Public Health.

Explaining the nomination process, the foundation's secretary general Dr Supat said the award consists of a medal, a certificate and a prize of fifty thousand dollars for laureates in each of two categories.



HM the King oversees award ceremonies



Prof. Harald zur Hausen and Prof. Eugene Goldwasser were honoured in 2005 for their work in public health and medicine, respectively

“The nominations, which are sent to my office in the first instance, have to be submitted before May 31 each year.” Dr Supat said nominations can be prepared by national medical or health authorities, or by individuals, or a group of individuals in a non-governmental capacity.

“First, the Scientific Advisory Committee (SAC) screens each candidate by researching an individual’s work. The SAC makes a shortlist to pass along to the International Award Committee (IAC) with ‘strong’ candidates marked as such.”

Doctor Supat said the IAC, which includes several internationally acclaimed experts in the fields of medicine and public health draws on the expertise of a cross-section of experts from each continent. The committee meets to deliberate under the chairmanship of Dr Vicharn Panich who has served as a member of the IAC since 2002 and as committee chairman since 2004.

Doctor Vicharn explained that in recent years the SAC has not only submitted a shortlist but also given the IAC a presentation of studies supporting each “strong” candidate.

“Then our committee takes time to deliberate candidates using the ‘D’, ‘B’, ‘L’ principle,” Dr Vicharn said, “where ‘D’, means the depth or scientific importance of the discovery sequence; ‘B’ means the breadth or wide impact affecting large numbers of people in many countries, and ‘L’, or length, measures the proven impact over a length of time.”

In addition to this, Dr Vicharn said the IAC gives further consideration and further evidence for or against a proposal putting forward objective and subjective judgements from various viewpoints. “We may even search for additional evidence through independent sources or via the internet before reaching a decision.” The IAC findings are then passed to the Board of Trustees in the form of a recommendation.

Over the years, the Prince Mahidol Award has gained a great deal of international recognition in the fields of medicine and public health. “It is most gratifying to note that two Prince Mahidol Award laureates went on to receive a Nobel Prize,” Dr Vicharn said.

The final arbiter in the selection process is the Board of Trustees under the chairmanship of HRH Princess Maha Chakri Sirindhorn. The award procedure is finalised by the end of each calendar year to enable presentations to be made in January of the following year.

Doctor Supat said that each nomination is valid for three years. “Candidates nominated may not necessarily receive an award in their first year of being nominated, but may receive one later following additional information concerning progress with their work.

“Awards are not given solely for making a new discovery,” said Dr Supat, “the foundation has to be sure it is being used and of benefit to mankind – within a particular country or around the world. That is why some recipients of the Prince Mahidol Award are generally quite senior people who have spent much of their lives working on long-term projects.”

As things stand today, the Prince Mahidol Award Foundation is the only entity in the world that gives an award in the field of public health in addition to medicine.



The Prince Mahidol Award Foundation is the only entity in the world that gives an award in the field of Public Health in addition to Medicine

Laureates of the Prince Mahidol Award

From 1992, when the Prince Mahidol Award was established, and up to 2014, 70 individuals have been honoured with the prestigious award in recognition of their outstanding contributions to the advancement of medicine and public health services for humanity. In so doing, they have followed in the footsteps of His Royal Highness Prince Mahidol of Songkla, the “Father of Modern Medicine and Public Health in Thailand”.

In this review, it is the presentation of the laureates of the Prince Mahidol Award from 2010 onwards.



Five professors from the United Kingdom and the United States were declared recipients of the **2010 Prince Mahidol Award**. In the field of medicine, the award was shared by two professors who discovered new methods for treating malaria; in the field of public health, the award was shared by three professors who pioneered work concerning the importance of zinc in human health.

1. Professor Ananda S. Prasad

(United States): 2010 in Public Health

In 1963, Professor Ananda S. Prasad described the first cases of human zinc deficiency syndrome in young adults exhibiting delayed sexual development, short stature, anaemia, enlargement of the liver and spleen, and abnormalities of bone maturation. Zinc supplementation resulted in significant increases in height, weight, bone development and sexual maturation. This pioneering work highlighted the importance of zinc in the health of humans gaining the attention of scientific and public health communities, which led to further studies of this important trace element. The discovery is a cornerstone for the use of zinc supplementation to improve people’s health around the world.





2. Professor Kenneth H. Brown (United States): 2010 in Public Health

Professor Kenneth H. Brown has devoted most of his career towards generating information and developing programmes to improve the status of nutrition and health, especially in controlling and preventing zinc deficiencies. He and his team conducted a series of community-based clinical trials studying the effect of zinc supplements on children's growth and development, as well as their risk of infection. The studies showed that additional zinc helped decrease the incidence and severity of diarrhoea and pneumonia, especially in children living in less-developed countries. Children born to mothers who receive zinc supplements during pregnancy have a lower incidence of diarrhoea. He and his colleagues further examined and evaluated various zinc fortification and supplementation strategies. Additionally, Professor Brown is influential in the International Zinc Nutrition Consultative Group that advocates zinc supplementation, which is now widely accepted as an important public health measure to prevent zinc deficiency, a major contributor to childhood morbidity and mortality.





3. Professor Robert E. Black (United States): 2010 in Public Health

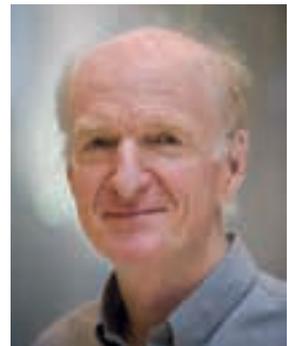
Professor Black's long-standing work on the importance of childhood nutrition significantly contributes to the wide application of zinc supplements. His earlier studies in Bangladesh and India demonstrated that daily zinc supplementation during diarrheal episodes significantly reduced the severity of diarrhoea. A similar situation applies in cases of pneumonia. He also described the diarrhoea-nutrition cycle, in which episodes of diarrhoea lead to malnutrition and deficiency of trace elements and, in turn, further augment the incidence and severity of diarrhoea. The World Health Organisation and UNICEF currently recommend that all childhood diarrhoea cases should be treated with zinc supplements as well as oral rehydration. The programme has been implemented in more than forty countries around the world.





4. Professor Nicholas J. White (United Kingdom): 2010 in Medicine

A world leader in the treatment of malaria, Professor White and his team carefully conducted a series of clinical studies that clearly demonstrated the effectiveness of artemisinin for treating previously drug-resistant malaria, first in Southeast Asia and subsequently around the world. He advocated combining artemisinin with other drugs to increase their efficacy and to avoid further drug resistance. This approach is now widely accepted by the WHO. Artemisinin-based combination therapy has now become the recommended treatment for malaria worldwide, both in uncomplicated and severe cases. The careful clinical and pharmacological studies conducted by Professor White and his colleagues have made a major contribution to current treatment protocols and policy. Each year, this approach saves millions of lives in developing countries, especially in Asia, and Africa where drug-resistant malaria is endemic.





5. Professor Kevin Marsh (United Kingdom): 2010 in Medicine

Professor Kevin Marsh pioneered the study of immune epidemiology of malaria. Based mainly in Africa, his earlier studies showed the importance of strain-specific immunity in malaria. His team examined the life cycle of malarial parasites in the human body and the body's response to infection, which led to the recognition of several variants of specific malaria antigens that play a key role in the pathogenesis of the disease. Professor Marsh and his colleagues carried out further immunological and clinical studies on several aspects of malaria in young African children resulting in the current understanding of the disease process and the effects of treatment. Their work provided the basis for the development of vaccines for malaria to cover various strain variations.





Dr Paul M. Grant represents Professor Aron T. Beck receiving the Prince Mahidol Award from HRH Princess Maha Chakri Sirindhorn

Two individuals from the United States and one from Australia were named the laureates of the **2011 Prince Mahidol Award**.

1. Professor Aaron T. Beck

(United States): 2011 in Medicine

The first person to work on the method of cognitive behavioural therapy (CBT) on patients suffering from depression, Professor Beck developed CBT in the early 1960s as a psychiatrist at the University of Pennsylvania. He researched, developed and tested the effectiveness of the method used on patients focusing on how “thinking” affects the way a person feels and acts and helps change their thinking, behaviour and emotional responses to become more rational. Later studies showed that CBT is the best method for treating major depression and is used widely by psychiatrists and psychotherapists. This treatment has helped more than 120,000,000 people suffering from major depression and reduced suicide rates among more than 1,000,000 people worldwide every year earning the professor the appellation “Father of Cognitive Behavioural Therapy”.





2. Dr David T. Wong (United States): 2011 in Medicine

Doctor Wong started his study and research work in the 1970s and later found fluoxetine, which was the first selective serotonin reuptake inhibitor (SSRI). It then took about fifteen years for the US Food and Drug Administration to approve fluoxetine for marketing as an antidepressant drug under the trade name Prozac in January 1988. In 1990, fluoxetine or Prozac became the most prescribed antidepressant because of its sustained effectiveness, low side-effects profile, overdose safety measures, and once-a-day dosing. It has been widely used to help more than 100,000,000 depressed patients around the world. Moreover, fluoxetine has become the basic model in developing many antidepressants.

Both cognitive behaviour therapy and fluoxetine have a major impact on the treatment of major depression, but the combination of the two gives a more effective and satisfactory result.





3. Dr Ruth F. Bishop (Australia): 2011 in Public Health

Doctor Bishop was the first person to discover that diarrhoea in under-six-year-old children around the world is caused by rotavirus. The virus claims the lives of about half a million children every year, especially in low- and lower-middle income countries in Africa and Asia. In 1973, Dr Bishop and her team at Royal Children's Hospital Melbourne examined cells from the intestines of children with gastroenteritis under an electron microscope and found that the virus had a round and wheel-like shape, hence the name "rotavirus".

Doctor Bishop also discovered the demonstration of protective immunity against severe diseases by natural neonatal rotavirus infection. This laid the groundwork for developing a vaccine against rotavirus. Since 2007 it has been mandated that every Australian child must be vaccinated against rotavirus diarrhoea. To date, the vaccine has been widely accepted and is used in more than sixty countries, including Thailand, helping save lives and providing health care to millions of children.





Two individuals were named the laureates of **the 2012 Prince Mahidol Award**.

**1. Sir Michael David Rawlins
(United Kingdom): 2012 in Medicine**

Sir Michael is considered a pioneer for bringing together approaches and practices of scientific and clinical-based evidence to evaluate the efficiency and worthiness of drugs, instruments and medical procedures. He has determined guidelines for medical treatment, incorporating the highest benefit and cost efficiency and established the National Institute for Health and Clinical Excellence (NICE) in 1999 to enforce the aforesaid approaches and practices. The institute is structured to systematically evaluate both positive and negative effects that occurred in the past, present and may occur in the future, including effects in health, economic, social and moral dimensions. These guidelines and practices of medicine led decision-makers to a more equitable use of resources, as well as a more transparent and accountable budget allocation.

Sir Michael's contribution provides patients with the highest attainable standard of cost effectiveness health care throughout the UK. Moreover, the key elements of the NICE have had a significant impact on health care policy subsequently adopted by various countries, including Thailand, thus benefiting the health care of hundreds of millions of people globally.





2. Dr Uche Veronica Amazigo (Nigeria): 2012 in Public Health

Considered a leading figure in the introduction and application of community-directed treatment and control of important diseases, Dr Amazigo has developed a model that makes it possible for community members to play a role in distributing medicines to the affected population.

She was instrumental in the successful control of Onchocerciasis (river blindness) by strengthening community health systems in 500,000 communities across nineteen countries covered by the African Programme on Onchocerciasis (APOC) of the World Health Organization, especially while she was director of the programme from 2005-2011. This approach changed the efficacy of the treatment; it is cost-effective and vastly increases the coverage of patients being treated by drugs, proving that community members can also take on the role normally played by more highly-trained health care specialists. The concept of community-directed treatment has since been implanted in several countries across Africa and around the world. By 2015, it is estimated that 90,000,000 people will regularly receive treatment for Onchocerciasis and 40,000 people will be prevented from contracting the disease annually.

The success of this community-directed approach results from linking research and management strategies and by empowering communities to fully participate in distributing medicine to the affected population. Although community-directed treatment was introduced as a strategy to increase coverage and access to drugs to treat Onchocerciasis, it went on to have an impact on the control of other diseases and essential health care services in Africa. It was estimated that the community-directed treatment benefited over 11,000,000 people in Africa, with malaria control and another 37,000,000 people from other types of diseases.





Four recipients of the **Prince Mahidol Award for 2013** were recognised for their essential contributions to AIDS prevention and control and for playing important roles in developing ways to cope with HIV/AIDS infections.

1. Professor David D. Ho

(United States): 2013 in Medicine

Doctor Ho, a leader in HIV/AIDS research, pioneered the highly active antiretroviral therapy (HAART) treatment for HIV-infected patients. His work is based on the study of the dynamics of HIV replication that is active even during the asymptomatic phase, leading to better understanding of the mechanisms of HIV infection and a new method of applying HAART treatment at an early stage of infection by applying the maximum level of viral suppression to effectively control viral replication.





2. Dr Anthony S. Fauci (United States): 2013 in Medicine

Doctor Fauci has made important contributions to understanding how HIV destroys the body's defences, progressing to AIDS. His discovery demonstrated that HIV replicates extensively in lymph nodes during the early asymptomatic phase and continuously destroys CD4+T lymphocytes leading to the deterioration of the immune system. He demonstrated that early treatment using highly active antiretroviral therapy (HAART) will effectively control HIV replication, witnessed by the reduction of the HIV viral load and number of CD4+T lymphocytes.

The approaches taken by Professor Ho and Doctor Fauci have been widely embraced and established a new standard for HIV/AIDS patient treatment – changing AIDS from a lethal, untreatable disease to a chronic one, and saving millions of lives throughout the world.





**3. Baron Peter Piot M.D.
(Belgium): 2013 in Public Health**

Baron Peter Piot began his study into HIV/AIDS epidemiology in 1980 while working on Project SIDA, the first AIDS research project in Africa. He then joined the World Health Organisation's Global Programme on AIDS in 1992 and later served as the first executive director of UNAIDS between 1994 and 2008. Doctor Piot played a major role in raising the global awareness of HIV/AIDS and promoted the inclusion of HIV/AIDS prevention in national development agendas among politicians, businessmen, scientists, and spiritual leaders. He has been instrumental in the rise of the global anti-AIDS movement, championed HIV prevention and lower prices for antiretroviral therapy, as well as providing greater access to medication for patients in less developed countries.





4. Dr Jim Yong Kim

(United States): 2013 in Public Health

During his time as director of the WHO's HIV/AIDS Department, Doctor Kim was at the forefront promoting universal access to antiretroviral drugs. After launching the "3 by 5 initiative" to support HIV/AIDS patients in low- and middle-income countries receiving highly active antiretroviral therapy (HAART), he managed to help three million patients receive this therapy in 2007. Doctor Kim achieved this by coordinating with UNAIDS, governments and concerned agencies to arrange funding, training courses and capacity building programmes for the treatment thereby reducing the cost of HAART therapies and enhancing treatment, prevention, and care for HIV/AIDS patients.

The earnest efforts of Dr Piot, during his tenure as executive director of UNAIDS, and Dr Kim, during his leadership as director of WHO's HIV/AIDS Department, have made HIV/AIDS treatment and prevention a global agenda, enabling faster, more comprehensive treatment that has saved millions of lives and benefited people's health throughout the world.



Prince Mahidol Award Laureate 2014

1. Dr Akira Endo

(Japan): 2014 in Medicine

Dr Akira Endo discovered the first anticholesterol statin called compactin (previously known as ML-236B), which he isolated from the fungus *Penicillium citrinum* in 1976.

Dr Endo studied over 6,000 types of fungi before he found one that reduced the amount of cholesterol in the blood, which he named ML-236B. It was able to block the enzyme HMG-CoA reductase, the critical rate-limiting step in the cholesterol synthesis pathway.

Cardiovascular diseases have been a major health burden in most nations around the world for many decades. Moreover, coronary heart disease (CHD) is also known to be responsible for a number of fatalities globally. These CHD fatalities are shown to be closely associated with hypercholesterolemia. Although cholesterol is important to the functioning human cells, its excessive level can lead to a formation of cholesterol plaque inside of arterial walls. The rupture of this plaque can result in the formation of blood clot inside arteries, thus reducing or blocking the blood flow, leading to a condition known as heart attack.

Dr Endo's pioneering work in the discovery of Statin has been recognised as a major milestone to the prevention and treatment of coronary heart disease as well as other major vascular diseases. The discovery of Statin by Dr Endo has shifted the paradigm in coronary heart disease from an unpreventable to a preventable one. His discovery also led to an effective treatment of hypercholesterolemia and a significant reduction of coronary heart disease and stroke, thus saving millions of lives worldwide.



2. Dr Donald A. Henderson (USA): 2014 in Public Health

Dr Donald A. Henderson led the World Health Organization's Global Smallpox Eradication Campaign. Smallpox is considered the first and only deadly disease that has been completely eradicated from the world.

Although the prevention of smallpox by inoculation of smallpox scabs was practised as early as 1000 BC, smallpox continued to be an important public health problem throughout the world in the 20th century especially developing countries. Although a vaccine for smallpox was discovered as early as 1796, there was still no way to prevent the spread of this disease. Smallpox caused an estimated 300–500 million deaths during the 20th century.

From 1966 to 1977, Dr Henderson led the WHO Smallpox Eradication Unit. The unit coordinated a global effort of mass vaccination campaign and intensive case surveillance that led to eradication of smallpox. The smallpox eradication campaign came to a successful conclusion in 1977 when the last case was reported in Somalia. On 8 May 1980, the WHO declared that the global goal of smallpox eradication had been achieved. Smallpox eradication has not only saved billions of lives but also has set an example on how to tackle more effectively other health problems.



Prince Mahidol Award Conference

In 2006, the Board of Trustees of the Prince Mahidol Award Foundation under the Royal Patronage began holding the Prince Mahidol Award Conference (PMAC) in commemoration of two special occasions: the 115th anniversary of the birthday anniversary of His Royal Highness Prince Mahidol of Songkla, and the 15th anniversary of the Prince Mahidol Award. The annual conference provides opportunities for Thai and international medical and public health personnel to exchange views and knowledge, apart from making the Prince Mahidol Award better known to the world at large.

The first PMAC took place in late January 2007 after the presentation of the 2006 Prince Mahidol Award. PMAC is scheduled for the final week of January after the Prince Mahidol Award ceremony each year.

Since 2007, PMAC has been co-hosted by the Prince Mahidol Award Foundation, the Ministry of Public Health of Thailand, Mahidol University, the World Health Organisation, the World Bank, the Rockefeller Foundation, the China Medical Board, and other international organisations related to the annual theme of the conference. Topics of discussion involve global health issues and an urgent developments agenda. The conference will summarise findings and propose concrete solutions, with an emphasis on policy-related public health issues of global significance.

Conference themes:

- PMAC 2007 – Improving Access to Essential Health Technologies: Focusing on Neglected Diseases, Reaching Neglected Populations
- PMAC 2008 – Three Decades of Primary Health Care: Reviewing the Past and Defining the Future
- PMAC 2009 – Mainstreaming Health into Public Policies
- PMAC 2010 – Global Health Information Forum
- PMAC 2011 – The 2nd Global Forum on Human Resources for Health: Reviewing Progress, Renewing Commitment to Health Workers towards MDGs and Beyond
- PMAC 2012 – Moving Towards Universal Health Coverage: Health Financing Matters
- PMAC 2013 – A World United Against Infectious Diseases: Cross-Sectoral Solutions
- PMAC 2014 – Transformative Learning for Health Equity
- PMAC 2015 – Global Health Post 2015: Accelerating Equity

Conference participants include academics, researchers, and public health leaders from various countries and organisations at national, regional, and international levels. Participants share experience and create networks and the results of meetings are summarised for decision-making and translated into action.

Prince Mahidol Award Youth Programme

The Prince Mahidol Award Youth Programme (PMA Youth Programme) is the third project managed by the Prince Mahidol Award Foundation. It was established on November 20, 2008, following a resolution at a meeting of the Board of Trustees of the Prince Mahidol Award Foundation. The programme aims to support and encourage young Thais who love the medical profession to follow in the footsteps of HRH Prince Mahidol of Songkla and help ease public health problems, as well as contributing to research and community development.

Under the programme, students in the fifth year of medical school from all faculties of medicine in Thailand are selected to receive royal scholarships for research, professional training, or community development work abroad or in-country for one year, which is counted towards their working time to repay the government for the scholarships. Each year, not more than five scholarships are offered to students.

Recipients of the scholarships under the PMA Youth Programme are provided with financial support for travel costs and arrangements to an overseas placement, a monthly living stipend, and health insurance. They are required to behave in a manner beneficial to their educational institutes and the medical community according to their chosen projects. After one year, they present to the PMA Youth Conference their



“His Royal Highness Prince Mahidol of Songkla was born a prince of the celestial order, yet the kindness which he extended to the commoners was extraordinary.”

experience and research work during their stay abroad. Recipients are encouraged to use their knowledge and experience to help tackle medical and public health problems in Thailand.

Among the medical fields of interest to the recipients, which have been chosen by the selection committee are the prevention of teenage pregnancy; HIV prevention among teenagers; migrant labour; adult and paediatric emergency medicine; obesity; diabetes; heart disease; weaken remembrance; cancer; hepatitis B; stem cell research, and proteomics.

The PMA Youth Programme is an important royal project, aimed at developing human resources and creating a network of good and capable people. It is supported by the Prince Mahidol Award Foundation and all faculties of medicine in Thailand. The objective is to inspire young Thais and facilitate their studies in the fields of medicine and public health, so that they will pursue a life of dedication for the benefit of mankind, following in the footsteps of His Royal Highness Prince Mahidol of Songkla.

A humanitarian award

In granting permission to establish the Prince Mahidol Award, His Majesty the King guaranteed an international exchange of research and knowledge in the fields of medicine and public health on a wider scale.

The laureates consider this award to be among the highest international honours they can receive acknowledging their work in medicine and/or public health. Many of them were personally inspired after receiving their award claiming that it helped them further their research into new and better ways to improve the health and wellbeing of people around the world.

Prince Mahidol of Songkla's humanitarianism and idealism were an inspiration to Her Royal Highness Princess Srinagarindra, Her Royal Highness Princess Galyani Vadhana Krom Luang Naradhiwas Rajanagarindra, King Ananda Mahidol, His Majesty King Bhumibol Adulyadej and other members of the Royal Family.

The Prince motivated them to be selfless and carry the belief that "all people, without distinction, have human dignity and worth". Moreover, he also served as a role model in devoting himself to the betterment of health, happiness, and well-being of the sick, the poor, and the underprivileged.

In delivering his eulogy on the occasion of the centennial celebration of the birth of HRH Prince Mahidol of Songkla, delivered to His Majesty the King in the Grand Palace, Bangkok, on January 1, 1992, H.E. Mr Anand Panyarachun, the then prime minister, said, "His Royal Highness Prince Mahidol of Songkla, the Prince Father, worked for the development of medical, nursing, pharmaceutical, and dentistry services, fisheries, as well as the Royal Thai Navy, higher education, and social services."

Mr Anand stated that Prince Mahidol of Songkla "...stressed the importance of a firm foundation for efficient medical services and medical sciences. He donated his private funds as scholarships for doctors, nurses, and scientists to study abroad. He funded and sought funding from other members of the Royal Family for the construction of classrooms and patient care facilities."

Also in his tribute, Mr Anand said, "His Royal Highness Prince Mahidol of Songkla was born a prince of the celestial order, yet the kindness that he extended to the

commoners was extraordinary, in line with his written message: ‘I shall study medicine because that is happiness. It provides us with opportunities to cure patients, both poor and rich, as well as members of the Royal Family.’ In a royal address to doctors, His Majesty once said, ‘Without His Royal Highness Prince Mahidol of Songkla, it may be assumed that medical services and others would not have reached the present stages of development’.”

Professor Dr A.G. Ellis, Dean of the Faculty of Medicine, Siriraj Hospital, in his written records, said “The birth of His Royal Highness Prince Mahidol of Songkla has certainly made this world a better place.

“All of us, who are in Your Majesty’s presence here, pledge to follow His Royal Highness Prince Mahidol of Songkla’s example for the everlasting advancement of humanity.”



Recipients of the Prince Mahidol Award from 1992-2014

Year	Laureates Name	Field	Country
1992	Sir William Richard Shaboe Doll, M.D.,F.R.C.P.,F.R.S.	Medicine	UK
1992	Professor Chen Minzhang, M.D.	Public Health	China
1993	Dr Ciro de Quadros, M.D.,M.P.H.	Public Health	Brazil
1993	Dr John B Stanbury, M.D.	Medicine	USA
1994	Dr Ho Wang Lee, M.D.,Ph.D.	Public Health	Korea
1994	Professor William Trager, Ph.D.	Medicine	USA
1995	Professor Egon Diczfalusy, M.D.,Ph.D.	Medicine	Sweden
1995	Professor Carl Djerassi, Ph.D.	Medicine	USA
1995	Dr Nafis Sadik, M.D.	Public Health	Pakistan
1995	Professor Frederick T Sai,	Public Health	Ghana
1996	Professor Vincent P Dole, M.D.	Public Health	USA
1996	Dr Suchitra Nimmannitya, M.D.,M.P.H.	Medicine	Thailand
1996	Professor Dr Prasong Tuchinda, M.D.,D.T.M.&H. (Eng)	Medicine	Thailand
1997	Dr Guillermo Arroyave, Ph.D.	Public Health	Guatemala
1997	Dr Satoshi Omura, Ph.D.	Medicine	Japan
1997	Professor Alfred Sommer, M.D.,M.H.S.	Public Health	USA
1997	Dr P. Roy Vagelos, M.D.	Medicine	USA
1998	Dr Margaret F.C. Chan, M.D.	Public Health	Hong Kong
1998	Dr Rene Favaloro, M.D.	Medicine	Argentina
1998	Professor Kenedy F Shortridge, Ph.D.	Public Health	Australia
1998	Dr Harvey D White, MB, ChB	Medicine	New Zealand
1999	Dr R. Palmer Beasley,	Medicine	USA
1999	Dr Tore Godal,	Public Health	Norway
1999	Dr Adetokunbo Oluwole Lucas,	Public Health	Nigeria
2000	Professor David J. P. Barker,	Medicine	UK
2000	Sir Iain Geoffrey Chalmers,	Public Health	UK
2000	Sir Richard Peto,	Public Health	UK
2000	Professor Ernesto Pollitt,	Medicine	Peru
2001	Professor Barry J Marshall, M.D.	Public Health	Australia
2001	Professor Lam Sai Kit, Ph.D.	Public Health	Malaysia
2001	Sir David John Weatherall,	Medicine	UK
2002	Sir Roy Calne, MB, BS, MA, MS, FRCS, FRCP	Medicine	UK
2002	Dr Maurice R Hilleman, Ph.D.	Public Health	USA
2002	Dr P.Helena Makela, M.D.,Ph.D.	Public Health	Finland
2002	Professor Thomas E Starzl, M.D.,Ph.D.	Medicine	USA

Year	Laureates Name	Field	Country
2003	China Cooperative Research Group on Qinghaosu and its Derivatives as Antimalarials	Medicine	China
2003	Professor Herbert L Needleman, M.D.	Public Health	USA
2004	Professor Jonathan M Samet, M.D.,M.S.	Public Health	USA
2004	Professor Norman Sartorius, M.D.,Ph.D.	Medicine	Germany
2005	Professor Eugene Goldwasser, Ph.D.	Medicine	USA
2005	Professor Harald Zur Hausen, M.D.	Public Health	Germany
2006	Dr Richard A. Cash, MD	Public Health	USA
2006	Dr Dilip Mahalanabis, MD	Public Health	India
2006	Dr David R. Nalin, MD	Public Health	USA
2006	Professor Stanley G Schultz, MD	Medicine	USA
2007	Professor Basil Stuart Hetzel,	Public Health	Australia
2007	Dr Sanduk Ruit, M.D.	Public Health	Nepal
2007	Professor Dr Axel Ullrich,	Medicine	Germany
2008	Professor Sergio Henrique Ferreira, M.D.	Medicine	Brazil
2008	Dr Michiaki Takahashi, M.D.	Public Health	Japan
2008	Professor Yu Yongxin, M.D.	Public Health	China
2009	Professor Anne Mills, Ph.D.	Medicine	UK
2009	Dr Wiwat Rojanapithayakorn, M.D.	Public Health	Thailand
2009	Mr Mechai Viravaidya,	Public Health	Thailand
2010	Professor Robert E. Black, M.D.	Public Health	USA
2010	Professor Kenneth H. Brown, M.D.	Public Health	USA
2010	Professor Kevin Marsh, M.D.	Medicine	UK
2010	Professor Ananda S. Prasad, M.D.	Public Health	USA
2010	Professor Nicholas J. White, M.D.	Medicine	UK
2011	Professor Aaron T Beck,	Medicine	USA
2011	Dr Ruth F. Bishop,	Public Health	Australia
2011	Dr David T Wong,	Medicine	USA
2012	Dr Uche Veronica Amazigo, Ph.D.	Public Health	Nigeria
2012	Sir Michael David Rawlins, MD.	Medicine	UK
2013	Dr Anthony Fauci, M.D.	Medicine	USA
2013	Dr David D. Ho, M.D.	Medicine	USA
2013	Dr Jim Yong Kim, M.D., Ph.D.	Public Health	USA
2013	Dr Peter Piot, M.D., Ph.D.	Public Health	Kingdom of Belgium
2014	Dr Akira Endo, Ph.D.	Medicine	Japan
2014	Dr Donald A. Henderson, M.D.	Public Health	USA



Chulabhorn Research Institute







CHULABHORN RESEARCH INSTITUTE

Professor Dr Her Royal Highness Princess Chulabhorn Mahidol, the youngest daughter of Their Majesties the King and Queen of Thailand, established the Chulabhorn Research Institute (CRI) on December 1, 1987, as a tribute on the auspicious occasion of the 60th birthday anniversary of His Majesty King Bhumibol Adulyadej. Since its inception, the ultimate goal of the Institute has been the application of science and technology for the improvement of the quality of life for the people

Main objectives and activities

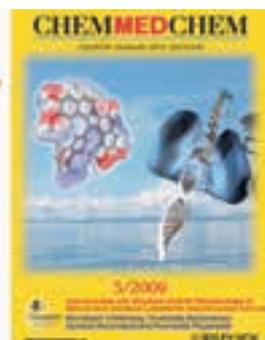
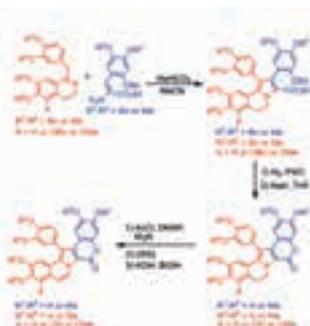
CRI promotes basic and applied research of national and regional importance, and serves as a centre for capacity building to produce qualified personnel in the fields of science and technology that are important human resources for sustainable development in the country and the region. This is hugely important, as there is a lack of critical mass of qualified personnel in these areas to meet the needs of developing countries. Another important mission of the Institute is to foster opportunities for Thai and international scientists to collaborate on research that addresses emerging issues in environmental health by acting as a centre for national and international cooperation and collaboration. CRI also promotes scientific and technological exchange and acquires resources for research and development in science and technology.



As the emphasis of the major activities of the Institute, including research, capacity building, scientific exchange, and special projects, is placed on improving the quality of life for the people, CRI also focuses on environmental remediation and natural resource management as important factors that impact on environmental health. Additional details on the activities of the Institute can be found on the CRI website: <http://www.cri.or.th>.



The Institute's research, which covers 4 major areas: chemistry, environmental toxicology, biomedical sciences and biotechnology, is conducted in one of 9 modern, well-equipped laboratories (Biochemistry, Biotechnology, Chemical Carcinogenesis, Environmental Toxicology, Immunology, Medicinal Chemistry, Natural Products, Organic Synthesis, and Pharmacology). The scope of the work conducted covers both basic research, with the goal of improving our fundamental knowledge in the respective fields, and integrated research involving many different but inter-related fields towards addressing real world problems. For example, several of CRI's research projects seek to increase our understanding of the relationships between exposure to environmental pollutants and resultant health impacts, including mechanisms of action, towards reducing public health risks, improving the quality of life, and preventing diseases, including cancer, which has become the leading cause of deaths in Thailand. This also includes research towards the development of therapeutic agents from natural products, e.g. plants, invertebrates and microbes.





The research conducted at CRI also has policy implications. An example is a study on the impact of environmental exposures to genotoxic air pollutants such as benzene and certain polycyclic aromatic hydrocarbons, which pose a cancer risk to exposed populations, such as Bangkok school children, traffic policemen, and street vendors, who are exposed to contaminated ambient air, and gasoline service station attendants and temple workers, who are exposed through their daily work activities. Several fields of scientific knowledge, specifically environmental toxicology, molecular epidemiology, molecular biology, and analytical chemistry, have been applied to these research projects to study the inter-relationships between exposures and early biological effects. The use of biomarkers of exposure and early biological effects associated with cancer is considered relatively advanced in terms of the application of the science. In 2000, the Thai Pollution Control Department (Ministry of Natural Resources and Environment) used CRI's findings as the basis for a policy decision to set an exposure standard for benzene in air to attempt to minimise the associated health risks.

Laboratory animal research is an important component of biomedical research. To address the issues of (a) quality assurance and (b) animal welfare for laboratory animal research, the CRI Office of Research established the Institutional Animal Care and Use Committee (IACUC) to oversee animal care and use in research in accordance with international guidelines. In 2010, the US-based Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) International awarded CRI with a full accreditation of the laboratory animal facility, making it the first Thai organisation to receive this full international accreditation.





International cooperation

CRI has maintained collaboration with international organisations and institutions of higher education involved in research and capacity building, including developed countries in the Asia-Pacific region that face similar public health problems to Thailand. Such collaboration helps improve the effectiveness of the work done by all parties involved, through pooling of expertise and resources, for the maximum benefit of mankind. Such collaboration includes joint-projects, and a sharing of information, research personnel, and associated expertise.

1. Research collaboration

Science is both universal and transcends borders, meaning that in today's era of globalisation, many problems relating to the environment and public health are no longer the sole domain of any one particular country, but are global issues. As such, scientific research to address these issues requires international collaboration for the exchange of knowledge, views and opinions towards solving these shared problems. Such collaboration with developed and developing nations, allowing for the sharing of expertise and experiences, and increases the capacity of individual countries to tackle their own problems.

Some examples of research collaboration includes:

Research on liver cancer and cholangiocarcinoma

CRI initiated a collaborative network in Thailand to mobilise resources and plan research in the north, northeast and central regions of the country. It has collaborated with Chiang Mai University, Khon Kaen University, the Thai National Cancer Institute, and Chulabhorn Hospital in conducting joint-research with the US National Cancer Institute under a project entitled, “Thailand Initiative for Genomics and Expression Research in Liver Cancer: TIGER-LC”. This on-going project involves establishment of a tumor bank set up to collect tumor samples from liver cancer and cholangiocarcinoma patients for further study at the molecular level. It is expected that this research will lead to the development of methods for preliminary diagnosis, and a better understanding of the initiation, pathogenesis, and progression of the diseases, as well as effective treatment options.



Research on the effects of in utero exposure to arsenic and early biological changes that may lead to manifestation of disease

CRI have collaborated with the Massachusetts Institute of Technology (MIT) in undertaking research on altered gene expression in babies born to mothers exposed to arsenic in drinking water during pregnancy. Results from this study, which identified a set of genes linking exposures with potential effects later in life, were published in PLoS Genetics in 2007 and rated among the fifteen outstanding studies of the year by the US National Institute of Environmental Health Sciences (NIEHS). A study was also conducted on the mechanisms of arsenic toxicity at the genetic and cellular levels through the use of various different cancer cells, with implications for drug development in the future.



NIOEH in the Socialist Republic of Vietnam

Following the success of the aforementioned research project on altered gene expression associated within utero arsenic exposure, CRI expanded its collaboration with a number of other foreign institutions, namely Columbia University (USA), the US NIEHS, the Gwangju Institute of Science and Technology (GIST, Republic of Korea), and the National Institute of Occupational and Environmental Health (NIOEH, Vietnam), in conducting a study on Vietnamese populations exposed to arsenic in water. Many parts of Vietnam face the problem of arsenic-contaminated water and soil.

CRI has collaborated with the Centre of Excellence on Environmental Health and Toxicology, the Office of Higher Education Commission, Mahidol University, Kasetsart University, Chiang Mai University, Khon Kaen University, and the Thai National Cancer Institute. International collaborators, apart from those that have already been mentioned, include MD Anderson Cancer Center and New York University (USA), Utrecht University (the Netherlands), Aarhus University (Denmark), and Nagoya University (Japan).





2. Educational and training collaboration

To address the aforementioned lack of critical mass of qualified personnel in the fields of science and technology in Thailand and other developing nations in South-East Asia, CRI initiated short-term (approximately 1-2 weeks) training programmes in these areas, including environmental toxicology and risk assessment of chemicals, over twenty years ago. These training programmes were developed in line with the vision of Professor Dr Her Royal Highness Princess Chulabhorn Mahidol, President of CRI, to develop the Institute into an organisation of academic excellence in education and training. For its long-standing efforts in promoting education and training, CRI has been acknowledged by several international organisations, including:

1. The United Nations Environmental Programme (UNEP), who in 1990 designated CRI's International Centre for Environmental and Industrial Toxicology (ICEIT) a **UNEP Centre of Excellence in Environmental and Industrial Toxicology**;
2. The World Health Organization (WHO), who in 2005 designated CRI as a **WHO Collaborating Centre for Capacity Building and Research in Environmental Health Science and Toxicology**; and
3. The WHO South-East Asia Regional Office (WHO-SEARO), who in 2013 designated CRI as a **Regional Training Centre on Chemical Safety**.



Aware that the proper management of chemicals was a crucial and urgent global issue, Her Royal Highness Princess Chulabhorn established the aforementioned International Centre for Environmental and Industrial Toxicology (ICEIT) in 1988 to serve as a centre for international and regional cooperation for technology transfer and human resource development in the fields of environmental and industrial toxicology and biotechnology. The ICEIT also aims to conduct basic and applied research towards prevention of problems related to environmental toxicology. Thailand and most other developing countries lack a critical mass of knowledgeable personnel in these fields at both the local and national levels. Through the years, the focus of the work of the centre has expanded to include environmental health issues, and in 2005, the name of the centre was changed to the International Centre for Environmental Health and Toxicology (ICEHT), in line with its broader mission.





Post-graduate education

Recognising that in addition to providing short-term training that targets personnel in governmental agencies who need additional training or refresher courses to help them in their line of work, there was also a pressing need to develop high-calibre personnel in science and technology for Thailand and other developing countries, particularly in the Southeast Asian region, CRI, in collaboration with Mahidol University and the Asian Institute of Technology, launched the Inter-university Post-graduate Degree Programme on Environmental Toxicology, Technology and Management (ETTM) to produce graduates at the M.Sc. and Ph.D. levels. The programme began admitting students in 1999, with collaboration with world-renowned international institutions such as MIT and Johns Hopkins University (USA); Utrecht University (the Netherlands) and Aarhus University (Denmark) in the form of teaching faculty and co-advisorship of student research. A total of thirty-five graduates at the doctoral degree level and fifty at the master's degree level have successfully undertaken this programme. In 2005, Professor Dr Her Royal Highness Princess Chulabhorn established the Chulabhorn Graduate Institute (CGI), with graduate-level programmes in three inter-related areas: Applied Biological Sciences - Environmental Health, Chemical Biology, and Environmental Toxicology, with the mission to produce leaders in science and technology in response to the growing demand for highly-qualified personnel in environmental health and chemistry.



Short-term training in environmental toxicology and chemical safety

The short-term training programme is aimed at disseminating knowledge on toxicology and environmental health and to develop personnel in these disciplines from both the public and private sectors in Thailand and other Asia-Pacific countries, particularly the developing nations. The targets for these short training courses are personnel from governmental agencies in these countries who need additional training or refresher courses to help them in their line of work, but who cannot spend extended periods of time away from their jobs. The syllabus mainly addresses the issues of chemical safety and chemicals management, i.e. the use of chemicals in everyday life, agriculture and industry, with minimal negative impacts on the environment and public health. Training comprises workshops in Thailand and other countries in the region, seminars at the executive level, and meetings for scientific cooperation. The programme has attracted valuable collaboration from world-renowned institutions and international experts in Europe and the United States. The programme is supported by several local and international organisations, such as the Office of the Higher Education Commission, the Thailand International Cooperation Agency; the United Nations Development Programme (UNDP), United Nations Environment Programme UNEP; WHO; the ASEAN Foundation; and the Asian Development Bank. To date, CRI has organised seventy-five training courses with more than 4,000 participants from thirty-one countries. The Institute has also arranged eleven in-country training courses in eight countries in the Asia-Pacific region, including Bhutan, Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, and Vietnam.





HM the King addressed the 2004 International Science Congress

Princess Chulabhorn International Science Congress

The Princess Chulabhorn International Science Congress takes place every three-to-five years and highlights the most current issues of global interest in science and technology. The first Congress, held in 1987, commemorated the 5th cycle (60th) birthday anniversary of His Majesty King Bhumibol Adulyadej. These congresses provide a forum for the exchange of the latest information and most recent advances in research achievement by local and international scientists. Speakers include Nobel laureates and leading international experts in their respective scientific fields of study. The Congresses also aim to keep Thai scientists up-to-date with the most recent advances in research by the international scientific community, and to provide a platform for exchange of ideas that can lead to further international collaboration in new and exciting areas of interest.

The 7th Princess Chulabhorn International Science Congress was held from November 29 to December 3, 2012 as a tribute to His Majesty the King on His 7th cycle (84th) birthday anniversary on December 5th, 2011, and to Her Majesty the Queen on the occasion of Her Majesty's 80th birthday anniversary on August 12, 2012. The theme of the Congress was, "Cancer: From Basic Research to Cure", and highlighted the latest developments in all areas of cancer research, including cancer etiology and molecular mechanisms, strategies for cancer prevention, early detection and diagnosis, as well as therapeutic interventions – all of which are crucial in the battle to overcome cancer.





The 8th Princess Chulabhorn International Science Congress is scheduled for 2016, and will be held as a tribute to Her Majesty the Queen on the occasion of Her Majesty's 7th cycle (84th) birthday anniversary. It will focus on the theme, "Environmental Health: Inter-linkages among the Environment, Chemicals, and Infectious Agents".

3. Collaboration with international organisations engaged in research and capacity building

3.1 World Health Organization (WHO)

As a result of collaborative efforts between CRI and the WHO in environmental health and toxicology over a sustained period of time, WHO designated CRI a WHO Collaborating Centre for Capacity Building and Research in Environmental Health Science and Toxicology in 2005. CRI is one among 800 organisations in eighty countries that have organised activities to support WHO in areas of occupational health, communicable diseases, chronic diseases and health technology.

The Institute has collaborated with the World Health Organization Southeast Asia Regional Office (WHO-SEARO), in disseminating knowledge and information about the safe use of chemicals through a web-based question-and-answer service. This Regional Chemical Help Desk, or "Chem HelpDesk", aims to narrow the knowledge gap between developed and developing countries in the management and safe use of chemicals, and to strengthen capabilities for the safe management of chemicals in Southeast Asian nations. The website posts a database of questions on chemical safety from registered users with corresponding answers from experts in the field, as well as other useful information related to global efforts in chemical safety, and links to other websites with other useful and related information. Additional information can be accessed at <http://www.chemhelpdesk.org>.



Besides WHO-SEARO, CRI has also collaborated with various other agencies under the United Nations' umbrella, such as the International Programme on Chemical Safety (IPCS), the WHO headquarters in Geneva, and WHO collaborating centres in other regions, such as those in Europe and North America, under the Strategic Approach to International Chemicals Management (SAICM). CRI collaborated with the WHO IPCS, University of Ottawa (Canada) and Utrecht University (the Netherlands), on a SAICM Quick Start Programme (QSP) project to develop an Electronic Distance Learning Tool (eDLT) on Risk Assessment and Risk Management of Chemicals that will be used to help develop personnel in this field in various countries in the region and around the world. Her Royal Highness Princess Chulabhorn officially launched the eDLT at WHO-SEARO in New Delhi, India, in 2013. Later, in March 2014, the eDLT project was voted the best SAICM QSP project in the region by participants of the 4th Asia-Pacific Regional Meeting on the Strategic Approach to International Chemicals Management, held in Kuala Lumpur, Malaysia. For more information, readers are invited to visit the website: <http://www.chemDLT.com>.





International Agency for Research on Cancer (IARC)

3.2 International Agency for Research on Cancer (IARC)

For more than twenty years, CRI has collaborated with the International Agency for Research on Cancer (IARC) in research, scientific exchange and training in epidemiology. In 2013, both institutions signed a Memorandum of Understanding (MOU) to collaborate on research in cancer, specifically intestinal, cervical, and breast cancers and cholangiocarcinoma, with the emphasis on exposure to various substances in early life that are associated with cancer and other negative health impacts that manifest later in life. Under the MOU, CRI and the IARC will work together to identify measures to reduce cancer incidence in Thailand and other countries in Asia.

3.3 Public Health England, United Kingdom

In 2014, CRI and the UK's Public Health England (PHE) signed an MOU for collaboration in the form of capacity building and information exchange towards the prevention of public health threats from toxic chemicals. The framework of this MOU includes cooperation with Cardiff Metropolitan University, Wales. This will include the development of a training module/courseware for both face-to-face and web-based training in the application of toxicology to a specific problem or in a regulatory context. The central theme will be the fundamental principles of toxicology, but can branch out into the areas of occupational health, chemical incidents, standard setting, food safety and genetic susceptibility. In addition to benefitting Thailand and the Thai people directly, this collaboration will also help to reduce public health threats, including diseases resulting from exposure to chemicals and other health hazards of global concern.

3.4 Various universities

Nagoya University, Japan – In 2013, CRI/CGI and Nagoya University agreed to collaborate in the areas of education and research; exchange of teaching staff; researchers; students; research equipment; scientific data and other matters of mutual interest.

Utrecht University, the Netherlands – CRI/CGI and Utrecht University have jointly launched a post-graduate dual-degree programme at the doctoral level. Graduates from CRI or CGI have the chance to be awarded doctoral degrees from Utrecht University if they meet the coursework, research and publications requirements of the university.



UK's Public Health England (PHE)



Nagoya University, Japan



Her Royal Highness Princess Chulabhorn, President of CRI, signs a Memorandum of Understanding with Utrecht University, Mahidol University, and the Asian Institute of Technology for collaboration in the Inter-University Post-graduate Degree Programme on Environmental Toxicology, Technology and Management (ETTM).

Chulabhorn Hospital

Recognising the health and socioeconomic impacts of cancer on patients and their families, Her Royal Highness Princess Chulabhorn established the Chulabhorn Hospital (formerly known as the Chulabhorn Cancer Center) as a tribute to Her Majesty Queen Sirikit on the occasion of Her Majesty's 72nd birthday anniversary in 2004. As a 100-bed hospital specialising in cancer treatment, the Chulabhorn Hospital strives to be an institution of cancer research and healthcare excellence, leading to effective cancer diagnosis, treatment, and prevention that meet international standards. The ultimate goal is to alleviate the suffering of cancer patients and to improve the Thai peoples' quality of life. The Chulabhorn Hospital was officially opened for business on October 29, 2009.

The hospital provides comprehensive cancer treatment services with modern medical equipment and advanced technology.

Patients are regarded as central to the health care treatment programme, both physically and emotionally. The modern medical services provided include surgery, radiation oncology and chemotherapy, as well as research in different areas, including applied research, clinical research and community research, e.g. a programme on the surveillance, prevention, and detection of major cancers found in Thailand, such as liver cancer, lung cancer, cervical cancer and colorectal cancer.





At present, a key research project being undertaken with researchers at the CRI is a project on liver cancer and cholangiocarcinoma, for which Her Royal Highness Princess Chulabhorn has graciously accepted the role of Project Director. In addition, studies have been conducted at the molecular level to identify biological indicators in colorectal, cervical and lung cancers.

The Chulabhorn Hospital, in collaboration with the Faculty of Medicine at Siriraj Hospital, the Faculty of Medicine at Ramathibodi Hospital, the Faculty of Medicine at Chulalongkorn University, and the National Cancer Institute, established the National Cyclotron and PET Scan Centre, the first of its kind in Thailand, which offers medical diagnosis using the most advanced techniques in nuclear medicine. This is the first facility in Thailand that can produce new radiopharmaceuticals for the diagnosis of disease, e.g. F18-FDG, F18-Fdopa, and C11-choline.

To date, the Chulabhorn Hospital has been successful in both providing treatment and conducting research. It is recognised as one of the most modern hospitals specialising in cancer treatment in Thailand, as well as in the Southeast Asian region. For more details of the activities of the Chulabhorn Hospital, readers should visit the website: <http://www.cccthai.org/>.

The National Cyclotron and PET Centre





Chulabhorn Graduate Institute

The Chulabhorn Graduate Institute (CGI) was established in 2005 to commemorate the occasion of the fourth cycle (48th) birthday anniversary of Her Royal Highness Princess Chulabhorn, the Chancellor of CGI. The vision of CGI is “Producing future leaders in science and technology”, to help address the aforementioned issue of the lack of critical mass of qualified personnel in science and technology.

CGI received approval from Thailand’s Ministry of Education to offer post-graduate level programmes to produce graduates in three different, yet inter-related, fields – applied biological sciences (environmental health), chemical biology, and environmental toxicology. The production of graduates from all three programmes will support national development and respond to the needs of the public and private sectors. Since its inception, CGI has closely collaborated with world-renowned international experts from the Massachusetts Institute of Technology (MIT) in curriculum development and teaching. Harvard University, Johns Hopkins University, Michigan State University, New York University, and the University of Florida (USA), Aarhus University (Denmark), University of Guelph and the University of Ottawa (Canada), the Imperial College London (UK), and Utrecht University (the Netherlands) as well as other leading academic and research institutions around the world.





CGI attaches great importance to enhancing the capabilities of its students. It has adopted a teaching and learning approach widely used at MIT and other top academic institutions by integrating several different fields of study together in problem-based learning, e.g. drug discovery and development to address the health impacts of diseases of concern for the country and the region, and using interactive teaching techniques that keep the students thinking and contributing to the courses. Students are trained in critical thinking, i.e. to be able to learn from and identify the strengths and weaknesses of the design and methodology used in published research. They are also taught to be aware of the advantages of seeking linkages between their research and the needs of the private/industrial sector for the benefit or national development. Doctoral students at the CGI who meet the requirements have the opportunity for research training at the aforementioned world-renowned academic and research institutions in the United States, Europe, and Asia.

Since 2006, more than one hundred students have enrolled in the various academic programmes at the Chulabhorn Graduate Institute. Apart from students from neighbouring countries, such as Lao PDR, Malaysia, Myanmar, and Vietnam. Those from Bhutan, Nepal, Indonesia, and Sri Lanka have also attended programmes at the Institute. For more information about the Chulabhorn Graduate Institute, please visit the CGI website at: <http://www.cgi.ac.th/>.



*Dr Frederick
F. Becker
conversing
with
HRH Prin-
cess Chulab-
horn*



Dr Frederick Becker, professor of molecular pathology, and Vice-President for Research and Science Director at the MD Anderson Cancer Center in Houston, spoke about the CRI.

“Through its research, publications and as a focus of informational interchange, it (the institute) has achieved remarkable importance in the fields of environmental research and population studies. In addition, its research into the derivation of medications from natural products, and in malaria, has achieved international recognition. As an outgrowth of excellence in science, the current initiatives in cancer treatment locally and throughout Thailand have identified this country and this centre as a role model for others to follow. The growth of its excellent efforts in clinical treatment and research into those cancers which have particular impact on its population should be a guide to those elsewhere who wish to emulate its success.”

Scientific awards and international acclaim

In 1986, one year before the establishment of the CRI, the United Nations Educational, Scientific and Cultural Organization (UNESCO) presented the Einstein Gold Medal to Her Royal Highness Princess Chulabhorn, the third person and the first scientist in the world to be awarded this medal in recognition of Her Royal Highness' relentless efforts in applying science and technology for the improvement of the people's quality of life, and for promoting scientific collaboration in the Asia-Pacific region, as well as globally.

Apart from the Einstein Gold Medal, many honours and accolades have been presented to Her Royal Highness, as President of CRI, for Her Royal Highness' role in scientific and technological research, and for laying the foundations for continuous training in environmental toxicology and chemical safety for development of human resources in Thailand and other developing countries in the Asia-Pacific. In 2013, the International Union of Toxicology (IUTOX) presented the 2013 Merit Award to Her





HRH Princess Chulabhorn receiving the Einstein Gold Medal of UNESCO (1986)

Royal Highness Princess Chulabhorn, in recognition of Her Royal Highness' significant work in the field of environmental toxicology and Her Royal Highness' numerous contributions to the development of toxicology and risk assessment training programmes in the Asia-Pacific region, especially in Southeast Asia.

Her Royal Highness Princess Chulabhorn was also presented with a chemistry award on the occasion of the 100th anniversary celebration of the Nobel Prize in Chemistry being awarded to Marie Curie. Her Royal Highness was among twenty-three scientists worldwide to be selected by the International Union of Pure and Applied Chemistry (IUPAC) and recognised in Her Royal Highness' role as a scientist with outstanding achievements in chemical research and scientific development in 2011.

International scientific awards presented to Her Royal Highness Princess Chulabhorn Mahidol

- UNESCO's Albert Einstein Gold Medal (1986)
- Tree of Learning Award (1990)
- EMS Alexander Hollaender International Fellow Award (2002)
- IFCS Special Recognition Award (2006)
- Nagoya Medal Special Award (2006)
- Albert Hofmann Centennial Gold Medal Award (2007)
- Windaus Medal (2009)
- Ramazzini Award (2009)
- International Order of Merit for the Inventors – IOMI "INVENT AND SERVE" (2011)
- Special Prize 2010 from the Korea Invention Promotion Association (KIPA) (2011)
- Distinguished Women in Chemistry/Chemical Engineering Award from the International Union of Pure and Applied Chemistry (IUPAC) (2011)
- The N.D. Zelinsky Award (2011)
- International Union of Toxicology (IUTOX) 2013 Merit Award (2013)

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and International Cooperation

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