

TRADITIONAL MEDICINE IN BHUTAN

Dorji Wangchuk, Director, Institute of Traditional Medicine Services

Introduction

Bhutan, which is also known as *sMen-jong rGyal-khab*, meaning the land of medicinal plants, is situated between India and China. It has total land area of 38,394 square kilometers with a population of 634,982 (est. in 2006) with GNP per capita income of USD 1400/- (NSB, 2006).

The country gradually rises from the luxurious jungle of the foothills, about 150 meters above sea level to the solitude of the snow-capped peaks, culminating at more than 7500 meters above sea level (ITMS, 2005). This difference in altitude, bringing almost tropical vegetation right to the base of glaciers, has enabled for plants of extremely different climatic and environmental conditions to grow in the same country. Tropical and subtropical forests are found in the south. Temperate and even Mediterranean plants flourish in the valleys, and very rare species grow up to 5000 meters.

With 72% of country under forest cover and the existence of varied climatic zones within a small geographical space, Bhutan is considered as one of the ten global biodiversity hot spots in the world and home to several endangered species of flora and fauna.

Besides its rich biodiversity and natural resources, Bhutan has a rich cultural heritage. Traditional medicine is one of the most important cultural heritages of Bhutan. In recognition of the importance and enormous benefit that can be accrued from this ancient healing system, Traditional medicine is integrated into the healthcare delivery system of Bhutan. Today, Bhutan has a unique healthcare system where people are provided with both modern and traditional healthcare services from the same window and has achieved significant human development as highlighted by the national health surveys below (Table 1).

Table 1: Selected health indicators of Bhutan (1984-2005)

Health Indicators	1984	1994	2000	2005
Infant mortality rate (per 1000)	102.8	70.7	60.5	40
Under-five mortality rate (per 1000)	162.4	96.9	84.0	62
Maternal mortality rate (per 1000)	7.7	3.8	2.5	NA
Life expectancy at birth (years)	48.0	66.0	66.3	66.3
Gross fertility rate (%)	169.6	172.7	142.7	NA
Annual population growth rate (%)	2.6	3.1	2.5	1.3
Health services coverage (%)	-	90%	+ 90%	+90%
Immunization coverage (5)	80%	90%	+ 90%	+ 90%

Source: Annual Health Bulletin, NA- not available

Most of the common diseases found in Bhutan are related to poor hygiene and sanitation, and are easily preventable. Although non-communicable diseases are not among the top 10 diseases, hypertension, diabetes, alcohol liver diseases and cancers are emerging at alarming rate.

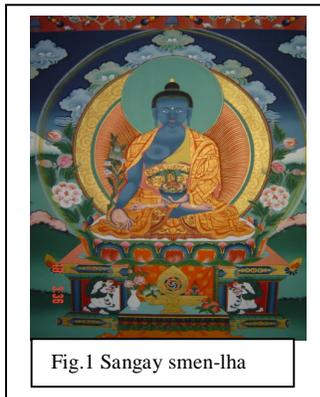
The healthcare infrastructure of country has made rapid progress over the years. As of December 2006, there were 29 hospitals, 176 basic health units, 406 outreach clinics. In the area of human

resources, there were 148 doctors, 21 technologists, 545 nurses, 480 health workers, 478 technicians, 40 Drungtshos and 58 sMenpas.

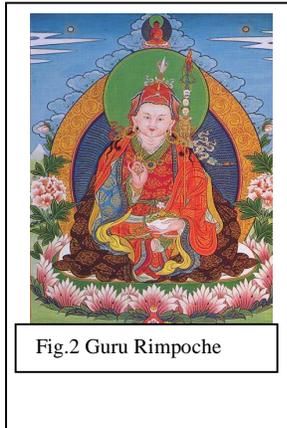
The government accords high priority to health as evidenced from the average allocation of 10-13% of the total government expenditure to healthcare.

This paper describes the historical perspectives, philosophy and recent developments of Bhutanese Traditional medicine.

Historical Perspective of Traditional Medicine (*gSo-ba Rig-pa*)



It is believed that at the beginning of time, the art of healing was a prerogative of the gods and it was not until Kashiraja Dewadas, an ancient Indian King who went to heaven to learn medicine from them, that it could be offered to man as a means to fight suffering. He taught his progeny, the principles and the practice of healing and this knowledge was spread and perpetuated as an oral tradition, until Lord Buddha appeared and gave specific written teachings on medicine. These were recorded in Sanskrit and became part of early Buddhist sacred writings.



After attaining enlightenment Buddha was able to define the origin of pain and discovered the way to eliminate it. His essential teachings are touched upon widely in the *rGyud-zhi* or the Four Tantras.

When Guru Rinpoche first brought Buddhism into Tibet in the eighth century, some of the early Buddhist writings in Sanskrit were translated into the Tibetan language and enlightened rulers of that country became interested in the subject. They started promoting the development of the art of healing by organizing meeting on medicine to which, they invited healers not only from the whole of Tibet and surrounding Himalayan countries but also from China, India, and the Muslim world.

It is reported that during those conferences, all the different medical systems were examined and the best practices adopted and incorporated into the newly born *gSo-ba Rig-pa* which was then handed down from one generation to the next. The tradition of *gSo-ba Rig-pa* began at the time of great Tibetan doctors including *Gyu-thog* the Elder in the eighth century and one of his descendants, *Gyu-thog* the Younger who lived in the eleventh century. The latter made a notable contribution in spreading the celebrated *rGyud-zhi* or "Four Medical Tantras" and its commentary the *Vai-dur-ya Ngon-po*.

Philosophy and principles of *gSo-ba Rig-pa*

gSo-ba Rig-pa is based on the great principles of Buddhism and provides a comprehensive way of understanding the universe, man, and his sicknesses.

In many ancient accounts, sickness is usually attributed to demonic causes. Local gods, demons and spirits of all kinds could be considered as responsible for certain illnesses. To obtain healing, it was necessary to practice particular rituals and only monks or magicians were in a position to do so. This medical practice, thus involved much divination in the means of diagnosing and recognizing the spells causing the illness and exorcism as the way of treating the patient. And even though medical techniques in Tibet and Bhutan developed subsequently observation, experience, study and knowledge, popular beliefs had a definite influence in the way how traditional medicine has evolved.

Buddhism teaches that the existence of phenomena and suffering (sickness, old age and death) have a single origin, namely ignorance that prevents man from reaching enlightenment. Ignorance is the origin of the three moral poisons: desire (*Dod-chag*), aggressiveness or hatred (*Zhel-dang*), and mental darkness or delusion (*Ti-mug*). In turn, these three moral poisons will produce the three pathogenic agents – air (*rLung*), bile (*mKhris-pa*) and phlegm (*Bad-kan*), which are the origin of sickness. With its overall conception of the universe and life, Buddhism is thus a way of linking medical theory to the same single source, in which sickness finds its natural place. Only knowledge, leading to enlightenment, can free mankind from this painful existence.

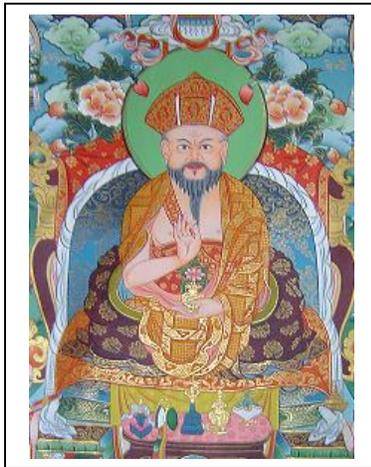


Fig. 3 Shabdrung Ngawang Namgyal

***gSo-ba Rig-pa* tradition in Bhutan**

The medical tradition which is still practiced in Bhutan has always been characterized by the diversity of its origins. Some principles of Indian and Chinese medicines and the ancient medical practices connected with magic and religion that existed in Bonism era before the advent of Buddhism have been assimilated into the philosophy and principles of *gSo-ba Rig-pa*.

When Shabdrung Ngawang Namgyal came to Bhutan in 1616, his Minister of Religion, Tenzing Drukda who was an esteemed physician, started the teaching of *gSo-ba Rig-pa* in Bhutan. Although there were sporadic instances of Bhutanese being sent by their patrons to study this art of medicine in Tibet before then, it was only after 1616 that *gSo-ba Rig-pa* was established permanently in Bhutan.

Since then, the Bhutanese tradition of *gSo-ba Rig-pa* has developed independently of its Tibetan origins and although the basic texts used are the same, some differences in practice make it a tradition particular to the country. The specific knowledge and experience gained by the Bhutanese over the centuries are still very much alive in this medical tradition. The natural environment with its exceptionally rich flora also enabled the development of a pharmacopoeia which is very unique in the world.

The names of many Bhutanese traditional physicians of the past who excelled in their skills are still remembered after their death. Unfortunately, very little is known of the traditional doctors who practiced in Bhutan from the time of Shabdrung Ngawang Namgyal to the time of the Wangchuck dynasty. However, according to Druk Karpo by Lopon Nado (1986), the names of Lopon Tshering Samdrup, Ngawang Dhargyal, Chang Gyeltshen and Lopon Tshewang Namgyal are mentioned as responsible for the development of *gSo-ba-rig-pa* in Bhutan during that period.

His Majesty Ugyen Wangchuck, the first King of Wangchuck dynasty had at his court a personal physician called Drungtsho Pemba who was the descendant of a family of traditional physician and whose father, Drungtsho Gyeltshen was said to have been the personal physician to the first King's father, Jigme Namgyal. Drungtsho Gyeltshen was born near Trongsa and was trained in Tibet in the famous Lhasa Medical School of Chagpori. Drungtsho Pemba's son Drungtsho Penjore who also studied at Chagpori acquired the fame of being the best doctor in the family and was called to serve at the court of His Majesty Jigme Wangchuck, the second King of Bhutan. The above-mentioned physicians used to send raw materials to Tibet and received the processed drugs from Chagpori. They apparently never manufactured the medicines.

Another Bhutanese physician at the court of the second King was Mahaguru, the former Gangtey Trulku's physician. Mahaguru himself was from Gangtey Gompa and trained as a doctor there. He was a very saintly man as well as a good doctor who prepared his own medicines whenever he needed to prescribe them to his patients. On His Majesty's orders, he was provided with regular rations from Wangdi Phodrang Dzong. At the age of seventy eight, he predicted and publicly announced the time and place of his death. His son stated that he died quietly and painlessly as predicted.

In the first half of the twentieth century, another famous physician was Drungtsho Chimi Gyeltshen. He was born in Mongar and when he turned twenty, he went to Tibet to study medicine at Chagpori. After staying there for sixteen years, during which he rose to the highest rank for a traditional physician, he came back to Bhutan at the bidding of Ashi Kenchock Wangmo, the second King's younger sister and settled near Kurtoe. Drungtsho Chime Gyeltshen died in Lhuntse in 1966.

Drungtsho Singye Namgyal from Bumthang Lamay Goenpa studied medicine from Drungtsho Pema Namgyal in Tshurpu, western Tibet. He came back to Bhutan and practiced privately till 1983. After that he was appointed as physician at Bumthang Hospital by the Health Department.

Recent Developments in Traditional Medicines

In November 1967, His Majesty Jigme Dorji Wangchuk the third King of Bhutan commanded the Health Department to establish traditional medicine system for the welfare of Bhutanese people and to preserve its rich culture and tradition. Accordingly, an Indigenous Dispensary was opened on 28th June 1968 at Dechencholing, Thimphu. The first persons to work in the Dispensary were Drungtsho Pema Dorji and Drungtsho Sherub Jordan, both of whom were trained in Tibet.

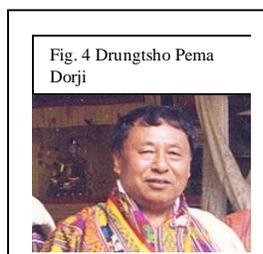


Fig. 4 Drungtsho Pema Dorji

Drungtsho Pema Dorji graduated in *gSo-ba Rig-pa* from the renowned Medical institute of Chag-po-ri. While serving as a clerk in the secretariat

of late His Majesty, Jigme Dorji Wangchuck, the third King commanded him to institutionalize and strengthen the age-old traditional medicine system in the country in 1967.

In his capacity as the head of National Indigenous Hospital (NIH) at Kawang Jangsa (1979) he spearheaded the development and strengthening of traditional medicine services in the country. In 1993 he became the director of National Institute of Traditional Medicine (NITM) and six years later he received the Druk Thuksey medal from the fourth Druk Gyalpo on the auspicious occasion of silver jubilee coronation, in recognition for his contribution towards the development of traditional medicine. He resigned from the service in 2002 as the Director emeritus.



Drungtsho Sherab Jorden, a personal physician to Lam Namkhai Ningpo worked with Drungtsho Pema Dorji from 1968 to 1997. He initiated the standardization and development of the Material Medica.

From a single Indigenous Dispensary in 1968, the traditional medical service has grown rapidly over the years to cover the entire country. By 2001 traditional medicine units were established in all 20 district hospitals. Seven more TM units were established at the sub district hospitals and basic health units (BHU) by 2007.

At the national level, the Indigenous Dispensary was upgraded to National Indigenous Hospital in 1979. The National Indigenous Hospital was renamed as the National Institute of Traditional Medicine (NITM) in 1988. In view of the increased functions, the NITM has been upgraded as the Institute of Traditional Medicine Services (ITMS) in 1998 with three functional units as the National Traditional Medicine Hospital (NTMH), National Institute of Traditional Medicine (NITM) and Pharmaceutical and Research Unit (PRU).

INSTITUTE OF TRADITIONAL MEDICINE SERVICES

Mandate: Development and provision of traditional medical services

Vision: Centre of excellence in the design, development and promotion of traditional medical services as complimentary to the modern health care services.

Mission: Provide high quality traditional medical services through development of appropriate human resources and production of safe and effective traditional medicines.

Values:

- Preservation of unique culture and tradition
- Efficient delivery of quality TM services
- Improving quality of life of the people
- Ensuring sustainability in traditional medical services
- Striving towards achieving the national goal of GNH

Core Business Areas

- Provision of Traditional Medical Services
- Human Resource Development

- Production of Traditional Medicines
- Research and Development

The ITMS is administratively under the Department of Medical Services, Ministry of Health. Although, there is separate budget line for each of the three units under ITMS, the financial management is with Administration and Finance Division (AFD) of the Ministry of Health. However, the Director of ITMS is the drawing and disbursement officer in relation to traditional medicine budget and has full authority to use the approved budget as per the delegation of financial powers by the Government.

The five year plans and annual work plans are prepared by different units in consultation with the ITMS management as per the guidelines and format provided by the Government and submitted to the Ministry of Health for incorporation in the health sector plan. Once the plans are approved by the Government the activities are implemented by the ITMS based on the approved annual budget. The overall total approved budget of ITMS for the fiscal year 2007-08 is Nu. 24.8 million (Table 2).

Table 2: Approved fiscal budget for the last six years (Nu. in Million)

F. Year	NITM		NTMH		PRU		Total	
	Cur.	Cap.	Cur.	Cap.	Cur.	Cap.	Cur.	Cap.
2002-03	2.119	0.720	5.005	0.565	4.543	5.385	11.667	6.670
2003-04	2.747	0.880	5.432	0.630	4.877	-	13.156	1.510
2004-05	3.302	0.250	5.774	0.100	5.523	3.380	14.599	3.730
2005-06	3.333	2.101	6.630	7.850	7.800	0.235	17.763	17.751
2006-07	3.288	0.360	8.728	1.525	8.089	0.460	20.105	2.345
2007-08	4.388	0.335	7.784	1.295	12.628	0.590	24.800	2.220

NATIONAL TRADITIONAL MEDICINE HOSPITAL (NTMH)

Mandate: Provision of quality traditional medical services

Vision: Service with a humane face and holistic approach

Mission: To develop and provide quality traditional medical services

Values:

- Prompt and efficient service
- Safe and effective treatment
- Concern and compassion towards patients

Core Business Areas:

- Traditional medical services
- Therapy services
- Operational research

Currently, there are 8 Drungtshos including the Medical Superintendent in NTMH for the provision of traditional medical and therapy services. As an apex hospital for traditional medicine in the country, it is responsible for providing tertiary care services and act as referral centre for the district hospitals.

The NTMH provides different therapies such as cauterization with gold and silver needles, blood letting, moxibustion, herbal bath, steam bath and application, nasal irrigation, massage with

medicated oils etc. whereas, at the district TM units only cauterization with gold and silver needle is provided at the moment.

Table 3: No. of patients treated at NTMH for the last 5 years

Year	New Pts.	Old Pts.	Total
2002	16458	14426	30884
2003	14185	17732	31917
2004	15603	16845	32448
2005	14215	18426	32641
2006	21457	21689	43146

Source: Annual morbidity reports of NTMH

Top 10 diseases treated at NTMH in 2006

1. Tsa-kar (Neurological problems)
2. Ya-khrag (Sinusitis)
3. Pho-ned (Ulcer and stomach disorders)
4. Bad-kan (Gastric problems)
5. Drum-bu (Arthritis and rheumatism)
6. Chuser Pak-ned (Skin diseases)
7. Khrag-rlung (Blood pressure)
8. Rim-ned (Cough and Cold)
9. Dab-drum (Chronic injuries)
10. Bad-rlung (Combination of gastric problem and pressure)

Currently, there are no in-patient services in the NTMH due to lack of infrastructure. However, in view of the need to provide intensive care and services to the patients seeking traditional medicines, and also for clinical teaching of the students of NITM, a proposal has been submitted to the Ministry of Health for establishing inpatient services in the NTMH during the 10th five year plan period. It would entail the construction of 20 bedded wards and related facilities like kitchen, store, and quarter for the cooks etc.

The NTMH also provides outreach services to 9 religious and meditation centres around Thimphu valley on a regular basis.

The Bhutanese traditional medicine is usually considered to be more effective for chronic diseases such as sinusitis, arthritis, asthma, rheumatism, liver problems and the diseases related to digestive and nervous system. The reason why traditional medicine is particularly good for such chronic diseases is mainly because of its holistic, rounded and profound approach in the treatment.

In future, there are plans to improve the quality of services through operational research and case studies in relevant areas of traditional medical practices. The traditional medicine units will be established in all health facilities in the country in a phased manner in line with the draft constitution of Bhutan.

District Traditional Medicine Units

The district Traditional Medicine Unit is manned by 1 Drungtsho (Traditional Physician) and 1 sMenpa (Traditional Clinical Assistant). For the benefit of rural communities, religious centres and secluded areas, out reach services for traditional medicine is introduced in all districts

whereby Drungtshos and sMenpas visit these places turn wise on a monthly basis.

Table 4: List of Traditional Medicine Units

S.No.	Traditional Medicine Unit	Year of Establishment
1.	Trashigang District Hospital	November 1979
2.	Trongsa District Hospital	July 1981
3.	Bumthang District Hospital	March 1982
4.	Haa Bali BHU Gr. I	November 1987
5.	Punakha District Hospital	January 1988
6.	Mongar Eastern Regional Hospital	March 1993
7.	Gaylephu Central Regional Hospital	November 1993
8.	Pema Gatsel District Hospital	March 1996
9.	Yebi Lapcha District Hospital	March 1996
10.	Samdrup Jhongkhar District Hospital	April 1996
11.	Paro District Hospital	December 1998
12.	Lhuntse District Hospital	October 1999
13.	Dagana BHU Gr. I	July 2000
14.	Samtse District Hospital	July 2000
15.	Damphu District Hospital	November 2000
16.	Wangdue Bajo BHU Gr. I	November 2000
17.	Gasa BHU Gr. I	November 2001
18.	Tsimalakha District Hospital	January 2002
19.	Phobjikha BHU Gr. II	20 th December 2004
20.	Ura BHU Gr. II	1 st June 2006
21.	Dorokha BHU Gr. II	15 th April 2006
22.	Korphu BHU Gr. II	1 st April 2006
23.	Daksa BHU Gr. II	9 th May 2006
24.	Phuntsholing sub-district hospital	1 st July 2007

Table 5: No. of Patients treated in District TM Units

Year	New Patients	Old Patients	Total
2002	53191	42947	96138
2003	43956	44564	98520
2004	55905	44064	99969
2005	57849	42896	100745
2006	62218	52059	114277

NATIONAL INSTITUTE OF TRADITIONAL MEDICINE (NITM)

Mandate: Human resource development for traditional medicine

Vision: Centre of excellence in learning and human development

Mission: Develop appropriate human resources with requisite knowledge and skills for the provision of traditional medical services

Values:

- Rich culture and tradition
- High quality of education
- Creativity and innovation
- Efficient delivery of programmes
-

Core Business Areas:

- Teaching and learning

- Continuing education programmes
- Research and development

The National Institute of Traditional Medicine (NITM) is one of the premier Institutes under the Ministry of Health and is responsible for the development of human resources required for the delivery of traditional medical services in the country. The NITM programmes are recognized by the Bhutan Medical and Health Council and the Royal Civil Service Commission. The Institute is also affiliated to the Royal University of Bhutan and follows the University academic programmes.

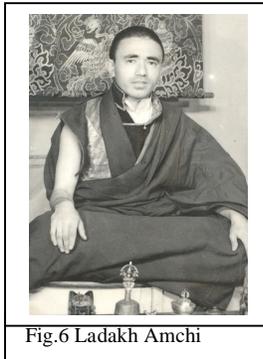


Fig.6 Ladakh Amchi

The institute shoulders the responsibility of preserving and promoting the unique system of *gSo-ba Rig-pa* through education and practice. The training program for sMenpa was started in 1971 as on-the job training at Decehncholing Dispensary as per the resolution of the 32nd session of the National Assembly. The training programme for the Drungtsho was introduced in 1978 as per the Royal command of His Majesty, the fourth King of Bhutan. The Pharmacy and Research Technician training programmes were introduced in 1998 following the establishment of the Pharmaceutical and Research Unit. Venerable Thubten Lekpai Lodre - Popularly known as Ladakh Amchi, was appointed as the first Principal in 1978 under the Royal Command. As a Principal and Lecturer, he developed standard training curricula for the five year Drungtsho program; revived the traditional methodology of gso-rig teaching and learning and established institutional norms.

Besides teaching and treating thousands of patients, he attended the royal court time to time. He was an in-born writer and composed many texts including a treatise on pulse reading and urinalysis. Today, his students form the core structure in provision of traditional medicine services throughout the entire kingdom.

Number of graduates

The numbers of student intake for each programme are based on the actual service delivery requirement of the health sector. Since its inception in 1971, the Institute has trained 43 Drungtshos, 58 Menpas, 12 Pharmacy Technicians and 11 Research Technicians.

The draft Constitution of Bhutan reflects the wisdom of providing free traditional medical services at par with modern medicine. This would require establishing traditional medicine units in all Basic Health Units (BHU) in the country and the demand for traditional medical practitioners especially, sMenpas will be increased drastically. The demographic changes and rapid socio-economic and political development will spur the need for more traditional medical practitioners in the country.

At present, the *gSo-ba Rig-pa* education is available only in Dzongkha and Choekye, limiting the recruitment of overseas students, but the affiliation of the Institute with the Royal University of Bhutan will lead to the development of programs in English for international students so as to generate revenue as well as promote the traditional medical system at the international level. This would increase the number of student intake by NITM.

Currently, there are only 46 Drungtshos and 58 sMenpas serving in the national and district TM hospitals, NITM and PRU. In addition to the existing strength a total of 25 Drungtshos and 271 sMenpas will be required. Also, from now on the attrition rate will be high as many Drungtshos will retire after reaching superannuation. In order to meet this additional requirement, there is need to increase the number of student intake for training programmes in the National Institute of Traditional Medicine.

In order to fulfill the number of additional requirement for Drungtshos and sMenpas, the annual intake of students will have to be increased as follows:

Category	2006	2007	2008	2009	2010	2011	2012	2013	2014
Drungtsho	3	3	6	6	6	6			
sMenpa	0	10	20	20	20	20	20	20	20

Considering the duration of training for Drungtsho as 5 years and for sMenpa as 3 years, we will have more than 80 students at any given point of time. If we continue the training of Pharmacy Technician and Research Technician as and when required, then the total number of students at any given point in time will be more than 100.

Since there is no capacity at present to increase the student intake, there is a need to construct a new separate teaching block with adequate class rooms and other facilities like library, multipurpose hall, demonstration laboratory, botanical garden, faculty rooms etc. The existing hostels also need to be expanded or rebuilt to accommodate more students. There is also a need to construct facilities for indoor and outdoor games.

The Ministry of Health and Royal University of Bhutan will need to take the lead role in mobilizing adequate financial resources either from the RGOB or donor agencies for the development of Institute infrastructures. A detailed master plan for infrastructure development including drawing and estimates will need to be drawn up. Since the Health Infrastructure Development Project (HIDP) is fully engaged in other projects, we may have to hire local consultants for this activity.

One of the biggest challenges is in mobilizing adequate resources for infrastructure development and improving training facilities to deliver quality training programmes. The faculty development is another important challenge in view of the limited scope for the Lecturers to pursue higher studies like Masters and Ph.D in Traditional Medicine. There is lack of personnel with adequate expertise in the development of training programs for higher and specialized courses.

The establishment of a separate training Institute with adequate infrastructures and facilities would ensure the quality of trainings offered to the practitioners of traditional medicine, thereby improving the quality of traditional medical services in the country. Together with the infrastructure development, the faculty development also needs to be given equal importance. The current faculty members lack skills in teaching methodologies and they also need to obtain Masters Degree for successfully implementing Bachelors degree programme.

The need for preserving our rich culture and unique tradition of *gSo-ba Rig-pa* as envisioned by our successive Monarchs can be achieved through establishment of such an Institute of international repute. The NITM can gradually introduce Masters programme in Traditional Medicine and conduct research in traditional medicine for the benefit of human beings.

The management and administration of NITM will be transferred to the Royal University of Bhutan from July 2008 as per the MOU signed between the Ministry of Health and RUB on 13th June 2007.

PHARMACEUTICAL AND RESEARCH UNIT (PRU)

Mandate: Production of safe and effective traditional medicines

Vision: Sustainable production of traditional medicines

Mission: To produce high quality traditional medicines and other herbal products based on principles of good manufacturing practices

Values:

- Ensuring safety and efficacy of all medicinal and herbal products
- Promoting innovation through research and development
- Building team spirit to increase work output
- Ensuring sustainability of natural medicinal resources
-

Core Business Areas:

- Collection and procurement of raw materials
- Production of traditional medicines in different dosage forms
- Production of commercial products
- Research and quality control of the raw materials and finished products
- Marketing of the products

The Pharmaceutical and Research Unit (PRU) was established in 1998 with the main mission of producing safe, effective and high quality traditional medicines and other health promoting herbal products through sustainable collection and utilization of medicinal ingredients. Since its establishment, all traditional medicines are produced using modern machines and technology and efforts are made to follow GMP norms and principles with emphasis on quality assurance (QA). Unlike modern drugs, traditional medicine in Bhutan is purely an indigenous product as its source, processing know-how, and the human resource capacity are all available in the country. Our preparations are purely natural and no chemicals are used. With the commissioning of the Pharmaceutical and Research Unit, shortage of traditional medicines has been significantly reduced. However, owing to the multi-ingredient nature and complexity of the production process, challenges are still faced to meet the demand.

The PRU has four main sections: Production, Research and Development, Quality Control and Marketing.

Production Section

This section is responsible for the manufacturing of traditional medicines based on the traditional formulae using latest production technology. The section currently produces approximately 8 metric tons of traditional medicines and meets the requirement of district Traditional Medicine

Units and the National Traditional Medicine Hospital in Thimphu. For better patient compliance and management, dosage forms are standardized. Currently, medicines are manufactured in the form of pills, tablets, capsules, syrups, ointment, medicated oil and powder. In addition, it also produces a dozen of herbal products for the local market.

Research and Development Section

This section is responsible for assuring quality and assessing the efficacy and safety of the traditional medicines. Research efforts are focused on authentication of species, building quality parameters both for raw materials and finished products and standardization of the production processes. The main objectives of the Research and Development Section are:

1. To scientifically validate the efficacy and safety of traditional medicine.
2. To ensure and enhance the quality and stability of traditional medicine.
3. To explore the opportunities for new products using natural resources to combat existing and emerging health problems.
4. To improve production methodologies.
5. To build monographs raw materials and finished products.
6. Documentation of medicinal plants including herbarium development.
7. Documentation of medicinal waters and hot springs in the country

Quality Control Section

The quality control section is responsible for:

1. Building Quality Control test parameters and standards for starting material and finished products.
2. Carrying out routine quality control tests on starting materials and finished products.
3. Drug efficacy and stability trails.
4. Establishing therapeutic value indices of medicinal plants.

Marketing Section

Marketing activities were initiated since 1998 onwards to streamline the procurement of raw materials and sales of medicines and other products. Since then, eight products were introduced for commercial sale in the local market. Tsheringma herbal tea and Tsheringma incense powder are two of the popular products at the moment. Few products such as incense sticks (3 types) and cordycep products have been introduced recently in the market.

A marketing strategy and a plan to market products both in the domestic and international markets were developed based on the capacity of the Unit. The market studies were also conducted within the region and in international markets.

Table 6: Raw materials purchased during 2006

Categories	Items	Quantity (kg)	Amount (Nu.)
High altitude medicinal plants	87	4995	1116439
Low altitude medicinal plants	26	4936.5	527406
Minerals	5	931	231209
Animal parts	11	253	1317028
Capsule shells		780	878080
Total	129	112095.5	4070162

Table 7: Marketing of the products in 2006

S.No.	Products	Quantity	Amount in Nu	Remarks
1.	Medicines	9251	6903878	Kg
2.	Tsheringma herbal tea	16077	871140	packets
3.	Cordy plus	344	533400	bottles
4.	Mensang	4393	409190	packets
5.	Incense sticks	311	46650	bundles
6.	Lumen rilbu	6635	33175	Pills
7.	Rinchen sna5 & sna7	177	91815	Pkts.
8.	Drebu Sumthang	74	10790	pkts
9.	sMen sna Phyma	688	89095	pkts
10.	sMendrup Phyma	184	101301	pkts
11.	Zangdru Phyma	188	83220	pkts
12.	Bumzey25	75	11250	Pkts
13.	Raw material	22	140369	Different types
	Total		9321273	

Currently, available commercial products are mainly sold in Thimphu through the sales counter located within the PRU complex. We have few wholesale buyers and shops that retail our products in Thimphu. Other than these, we have just one wholesale buyer outside Thimphu which is in Paro.

Although one preliminary market study has been done in Bumthang, Trashigang and Gelephu, no retail agents have been identified. Identifying few agents in these towns could boost our sales. Other avenues such as art shops, museums, gift shops, hotels and restaurants need to be explored as well. It is clear that the sales from new products are contributing significantly to the generation of revenue for Revolving Fund.

The Revolving Fund (RF) was established in November 1996 with the noble vision to ease the financial burden on the Royal Government of Bhutan (RGoB) for the procurement of medicinal ingredients and at the same time to gradually make the Pharmaceutical & Research Unit a financially self-sustainable entity. It was approved by the Project Steering Committee and the Ministry of Finance. Today, we no longer require funds from the Royal Government to procure medicinal herbs and other ingredients for manufacturing traditional medicines.

The initial mandate of the Revolving Fund was to:

- a) Pay for all the raw material purchases required for the production of traditional medicines.
- b) Accept any/all sales proceeds from the Pharmaceutical & Research Unit as an income of the Fund without requiring to be deposited into the Government Revenue Account.

All supplies of traditional medicines made to the Department of Medical Services are billed to the Ministry of Health and the sales proceeds deposited into the Revolving Fund.

Since its inception, the Revolving Fund has been able to carry out its mandate of raw material procurement successfully. Shortage of funds for procuring medicinal ingredients has never occurred. Therefore, the focus of the RF today is more towards making the production of traditional medicines a self-sustainable and a commercially-viable entity for PRU in the long run.

The main sources for the Fund are: a) sales of commercial products and b) sales of traditional medicines. The income generated from the sales of essential traditional medicines to the Drugs,

Vaccines and Equipment Division (DVED), Ministry of Health, has been the largest source. The total income from the sale of medicines to DVED for the year 2006 amounts to Nu. 6.9 millions, which is 54%, increase from the previous year. As the traditional healthcare services expand further to meet the healthcare needs, there is scope for the Fund to grow through increase in sale of traditional medicines.

There have been similar achievements on the commercial products' front. The sales of various commercial products including herbal tea, incense sticks & powders, health promoting and other religious products, amounts to Nu. 2.4 millions which is a 78% increase from the previous year. This is attributed to the introduction of new products like CordyPLUS, Dri-Zang incense sticks (protecting and calming) and also due to the price revision done after improvement of packaging and labeling designs for Tsheringma Herbal tea. Also, this increase is due to the 2 new outlets in Thimphu that were appointed during the year.

On the expenditure front, purchase of raw materials/ingredients is the main area amounting to Nu. 5.2 millions during the year. This purchase consists of high and low altitude medicinal plants, minerals, animal parts and other ingredients. Other expenditures include those incurred for packaging materials, casual labor and other overhead expenses.

Given the primary mandate of supplying our core products, the shortages and restrictions of supply and the complexity and cost of complying with international drug standards, we obviously cannot cater to the wider market. However, niche marketing is very possible. Our niche comprises people with very strong social and environmental values and who have an interest in the Buddhist ethics that forms a large part of our collective culture - people who are not just looking at the product but into the whole process of making it and the spiritual values that lie at the core.

Conclusion

Provided we can sustain, further nurture and communicate these values, our customers, regardless of their location, can be assured that they purchase a product that is morally and ethically wholesome and that their money supports needy households in the Himalayas, funds R&D on traditional medicines in Bhutan and keeps this rich resource and its cultural roots alive for all our children.

Developing products for export requires further work on quality. Products are marketable only if they are certified by applicable international standards like the GMP, HACCP, ISO, etc. This requires the PRU to be able to work to these standards; from the sourcing of our raw materials up until finished products are delivered to the consumer.

Product development is an essential process and should continue developing products that ideally must all originate or evolve from *gSo-ba Rig-pa*. Local and foreign customers are concerned about the origin of health related products and clearly, products that have been in use for centuries and developed by the Medicine Buddha himself are both more efficacious and more appealing, even to those that do not share Mahayana beliefs.

The PRU will be de-linked from the Ministry of Health and become a Corporation in the near future. The Govt. has already approved for making it as a corporation to improve its efficiency in the production of traditional medicines and commercial products. The details are being worked out for smooth transition from a Govt. organization to a corporation.