

AN INTRODUCTION TO TRADITIONAL MEDICINE SERVICES IN BHUTAN



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Homage to Medicine Buddha

“If one meditates on the medicine Buddha, one will eventually attain enlightenment, but in the meantime one will experience an increase in healing powers both for oneself and others and a decrease in physical and mental illness and suffering.”

Thrangü Rinpoche

Tad-ya-tha: OM Be-kkan-dze Be-kkan-dze Ma-ha Be-kkan-dze Ra-dza Sa-mung Ga-te So-wa-ha!

Introduction

Bhutan is known as *Menjong Gyalkhab*, meaning the land of medicinal plants. Above the Indian plains, 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.

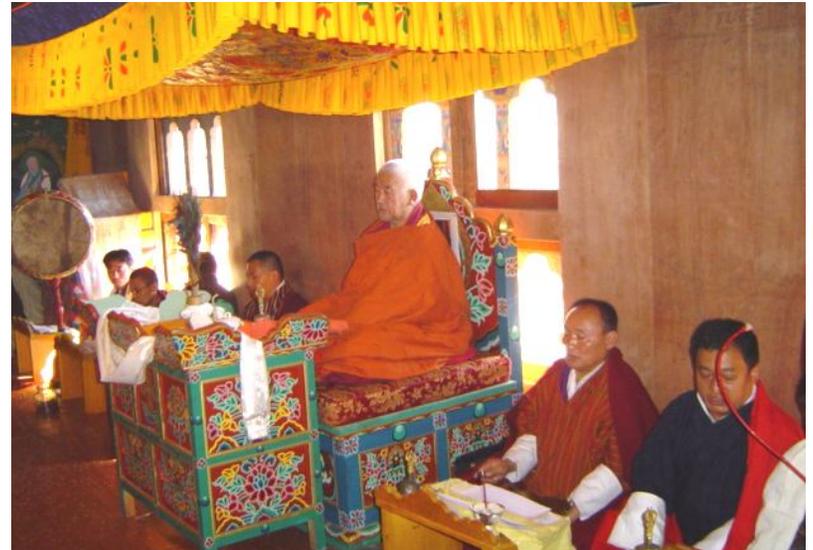
The small Himalayan Kingdom of Bhutan is situated between India and China and is totally landlocked. The country has a forest cover of over 72% attributing to the presence of a rich biological diversity. These forests are home to several endangered species of flora and fauna harbouring over 7000 species of plant, 165 species of mammals and 700 species of birds. Apart from its rich biodiversity and natural resources, Bhutan has a rich cultural heritage which is still characterized by a certain amount of traditional features like traditional medicine.



Lingshi where most of the high altitude medicinal plants are collected

This difference in altitude, bringing almost tropical vegetation right to the base of glaciers, has made it possible 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 specimens grow up to 5000 meters. To date, more than 600 medicinal plants have been identified in Bhutan, and at least 300 of these are commonly used by practitioners in the country for preparing medicines.

The Bhutanese traditional medical system goes well beyond the notion of medicine in the narrow Western sense. It forms part of a whole - blending culture and tradition, in which Buddhism is the prevailing influence. Health and spirituality are inseparable and together they reveal the true origins of any sickness. The art of healing is therefore a dimension of the sacred.



Lopon Kinley Dorji presiding over Menlha Choga

Development of Traditional Medical Services

In November 1967, the third Druk Gyalpo, His Majesty King Jigme Dorji Wangchuck 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.



Dechencholing Dispensary

From a single Indigenous Dispensary

in 1968, the traditional medical service has grown rapidly over the years to cover the entire country. Today, there are 39 traditional medicine units attached to the district hospitals and basic health units in view of the national health policy of integration.

Late Drungtsho Pema Dorji



Main Hospital building

At the national level, the Indigenous Dispensary was upgraded to National Indigenous Hospital in 1979 and shifted to the present site in Kawang Jangsa from Dechencholing. 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 and the post of Director was created. There are three functional units under the ITMS as follows:

1. **National Traditional Medicine Hospital** is responsible for the development and provision of quality traditional medical services including different therapies. It is headed by the Medical Superintendent and there are 10 Drungtshos and 8 Menpas working in this hospital.
2. **National Institute of Traditional Medicine** is headed by the Director and is responsible for development of human

resources required for the traditional medicine services. Eight Drungtshos are working in the Institute as lecturers.

3. Pharmaceutical and Research Unit is responsible for the manufacturing and production of medicines, conducting quality control for both raw materials and finished products, carrying out research activities and marketing of the products. The unit is headed by a Pharmacist.



The Administration Block

The main aims and objectives of ITMS are to:

- a) Promote traditional system of medicine in the country
- b) Preserve the unique culture and tradition related medical practice
- c) Provide alternative medicine as complementary to the allopathic system
- d) Produce medicines required by the traditional medical system
- e) Conduct research and quality control of drugs

- f) Develop human resources required for the traditional medical system
- g) Achieve excellence in traditional medical services in Bhutan.

Historical Background

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 the lord Buddha appeared and gave specific written teachings on medicine. These were recorded in Sanskrit and became part of early Buddhist sacred writings.

When Guru Rinpoche first brought Buddhism into Tibet in the eighth century, some of these medicinal texts 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



Guru Rinpoche

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.



gYuthog Yonten Gempo

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 Gyuthog "the Elder" in the eighth century, and one of his descendants, Gyuthog "the Younger," who lived in the eleventh century. The latter made a notable contribution in spreading the celebrated

Gyu'shi or "Four Medical Tantras" and its commentary, the Vaidurya Ngonpo.

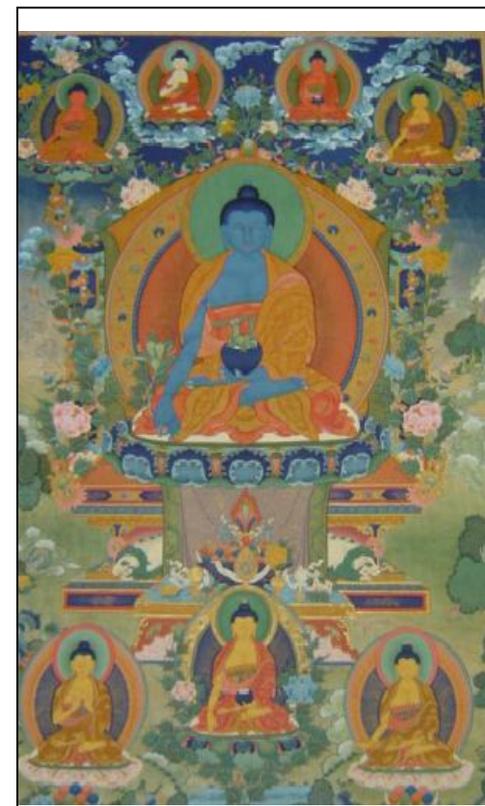
Sources of gSo-ba Rig-pa Tradition

Though it took shape in Tibet, this medical tradition, which is still practiced in Bhutan, has always been characterized by the diversity of its origins. It is based on Indian and Chinese traditions and has also incorporated ancient medical practices connected with magic and religion. However, in essence, it is based on the great principles of Buddhism and provides a comprehensive way of understanding the universe, man, and his sicknesses.

These two great systems of thought inspired Bhutanese traditional medicine, but there were also local influences. 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 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 traditional medicine evolved.

Over and above these various influences, Buddhism itself is at the heart of Bhutanese medical traditions. Buddhism teaches that the existence of phenomena and suffering (sickness, old age and death) have a single origin that prevents man from reaching enlightenment, namely ignorance. This is the origin of the three moral poisons: desire, hatred and delusion. In



sMenlha Choe-gyed

turn, these three moral poisons will produce the three pathogenic agents - air, bile and phlegm, which are the origin of sickness if they are imbalanced. 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.

It was only after reaching enlightenment and understanding of the ties binding man to this world and the means of freeing himself from them that Buddha could define the origin of pain, discover the way to eliminate it and teach an effective theory. It is therefore not surprising that he became the most outstanding healer.

Through his own experience he discovered the art of healing old age, sickness and death. The divinity of medicine, Sangye Menlha, is represented in traditional iconography with a blue body. His right hand holds out the Terminalia Chebula (Aru), which is believed to cure all illnesses, as a gift. In his left hand is a bowl of ambrosia, the elixir of immortality.

gSo-ba Rig-pa in Bhutan and Physicians of this Century

When Shabdrung Ngawang Namgyal came to Bhutan in 1616, his Minister of Religion, Tenzing Drukda, who was an esteemed physician, started the spread and teaching of gSo-ba Rig-pa. Although there were sporadic instances of Bhutanese being sent by their patrons to study this art 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 doctors of the past who excelled in their skills have remained alive in the memory of the people long 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, published in 1986 at Tharpaling Monastery Bumthang, the following names were mentioned as responsible for the development of gSo-ba Rig-pa in Bhutan during that period. They were: Lopon Tshering Samdrup, Ngawang Dhargyal, Chang Gyeltshen and Lopn Tshewang Namgyal

His Majesty Ugyen Wangchuck, the first King of this dynasty, had at his court a personal physician called Drungtsho Pemba, who was the descendant of a family of traditional doctors and



Shabdrung Rinpoche

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 Tongsa and was trained in Tibet in the famous Lhasa Medical School of Chagpori. Duntsho Pemba's son, Duntsho 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. According to some accounts, Duntsho Penjore, was very close to the second King and a very good archer. The above-mentioned physicians used to send raw materials to Tibet and received the prepared 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, 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. People estimated that he died at the age of 100.

In the first half of the twentieth century, another famous physician was Duntsho 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 Lhuntshi in 1966.

Druntsho Singye Namgyal from Bumthang Lamay Goenpa studied medicine from Druntsho 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.

National Policy

The National policy for Traditional Medicine is to preserve and promote the unique system of medicine that is based on rich culture and tradition, through capacity building and establishing an effective system within the framework of national health care delivery system.

Bhutan 2020: A Vision for Peace, Prosperity and Happiness states the importance of Traditional Medicine as follows. *“We must continue to provide a place for traditional medicine in our system of health care. Traditional medicine embodies knowledge that has been accumulated over centuries and which draws upon the nation’s rich bio-diversity and of plants with proven medical qualities. As these qualities become substantiated by scientific research, there is a growing need to integrate more effectively traditional medicine with the modern system of health care. The maintenance of traditional medicine not only adds dimensions to the nation’s system of health care, but provides an alternative for those who seek one. It should also be regarded as a conscious decision to conserve a part of our rich and varied cultural heritage”.*

Therefore, strengthening of traditional medicine and integrating it with modern health care system is considered as an important policy objective of the health sector.

National Traditional Medicine Hospital

The traditional medical service functions as an integral part of the national healthcare delivery system. It is available in all 20 districts and is housed under the same roof of district hospitals and basic health units for mutual consultation, treatment and cross referral of patients.



OPD Block

The system is quite popular especially amongst the older population and treats about 20-30% of the daily OPD patients in the district hospitals and basic health units. The national hospital in Thimphu treats about 200 – 250 patients per day in summer and about 150 to 200 patients in winter. For the benefit general public, the NTMH has also extended the service timing from 3 – 6 PM from Monday to Friday and 1 – 3 PM on Saturdays.

The National Traditional Medicine Hospital provides different therapies such as Acupressure with gold and silver needles, blood letting, moxabustion, herbal bath, steam bath and application, nasal irrigation, massage with medicated oils etc. At the district TM units, only acupressure with gold and silver needle is provided. Few district TM units have also started providing steam therapy services

The traditional medicine is considered more effective for chronic diseases such as sinusitis, arthritis, asthma, rheumatism, liver problems, diseases related to digestive and

nervous system etc. The reason why traditional medicine is particularly good for such chronic diseases is because of its holistic, rounded and profound approach in the treatment of patients.

The main objective of traditional medical services in future is to improve the quality of services through conducting operational research and case studies in relevant areas.

No. of Patients treated in National TM hospital:

Year	New cases	Old cases	Total
2004	15603	16845	32448
2005	14215	18426	32641
2006	21517	21749	43266
2007	21071	20231	41302
2008	21839	18924	40763
2009	22385	25158	47543

No. of Patient treated during outreach services and extended service extra time w.e.f. July 2009 to December 2009

Sl.No.	Area of treatment	Number of patient
1	Extra services	1162
2	Outreach service	2216
3	Therapy conducted during extra time service	639
	Total	4017

No. of patients for different Therapies:

Therapy	2005	2006	2007	2008	2009
གདང་ Blood letting	100	118	141	134	175
གསེར་ལབ་ Golden needle therapy	4116	3698	3943	4212	4895
དུང་ལབ་ Silver needle therapy	105	345	23	56	96
སྤུ་ཚུགས་ Heated oil cauterization	486	628	344	668	1277
ཆེང་སྤུགས་ Localized steaming	4056	4243	5151	4554	4724
ཆེང་སྤུམ་ Steam bath	1255	1492	1669	2229	2349
ཚུམ་ལམ་ Herbal bath	2656	2684	2455	2639	2412
སྤྲོད་སྤུ་ Nasal irrigation	341	547	461	803	1005

TOP TEN DISEASES IN 2009 (NTMH)

1	ཡམ་ལག་ Sinusitis	3546
2	ལྷན་རྒྱུ་ Hyper pressure	2746
3	ཚད་ཀར་ Neurological diseases	2423
4	གྲུ་མཐུ་ Arthritis	2284
5	མ་ནད་ Ulcer and Stomach disorders	1969

6	གདང་ཚུད་ Gastritis	1967
7	མཁལ་འགྲུམ་ Renal trauma	1919
8	བད་ལྷག་ Bad-khrag	1836
9	རི་མས་ནད་ Common cold	1512
10	བད་ཚུད་ Bed Lung	1426
Total		21628

District Traditional Medicine Units

Currently, there are 39 Traditional Medicine Units in all 20 districts and there is a plan to establish traditional medicine units in all the basic health units as enshrined in the Constitution of the Kingdom of Bhutan. The district Traditional Medicine Unit is manned by 1 Drungtsho (Traditional Physician) and 1 Menpa (Clinical Assistant). The Traditional Medicine Unit in the Basic Health Units is manned by 1 Menpa. For the benefit of rural communities, religious centres and secluded areas, an out reach services for traditional medicine is introduced in all districts where Drungthos and Menpas visit these places on a monthly basis.

Establishment of Dzongkhag TM Units:

Dzongkhag	Year of Establishment	Dzongkhag	Year of establishment
Trashigang	Nov. 1979	Trongsa	Jul. 1981
Bumthang	Mar. 1982	Haa	Nov. 1987
Punakha	Jan. 1988	Mongar	Mar. 1993
Sarpang	Nov. 1993	P/Gatshel	Mar. 1996
Zhemgang	Mar. 1996	S/Jongkhar	Apr. 1996
Paro	Dec. 1998	Lhuntse	Oct. 1999

Dagana	Jul. 2000	Samtse	Jul. 2000
Tsirang	Nov. 2000	Wangdue	Nov. 2000
Gasa	Nov. 2001	Chukha	Jan. 2002
Reserboo	11/2004	Phobjikha	12/2004
Dorokha	4/2006	Rang Jung	9/2008
Ura	6/2006	Daga Pela	9/2008
Daksa	5/2006	Zhemgang	9/2008
Korphu	4/2006	Pan Bang	9/2008
P/ling	7/2007	SamdrupCholing	9/2008
Kanglung	9/2008	LhamoiZhingkha	9/2008
Kengkhar	9/2008	Jomotsangkha	9/2008
Drametse	9/2008	Gedu	1/1/2010
Nganglam	9/2008		

Traditional medical practice

In the traditional medical system, the diseases are based on three elements of the body viz: Air, Bile and Phlegm commonly known as rLung, mkhrispa and Badkan. rLung (air) is responsible for respiration, movement of hollow organs such as intestine, lungs, heart, blood vessels etc. Mkhrispa (bile) stimulates appetite, helps in digestion and maintains body temperature. It also claims to confer bravery, wisdom, and desire or ambition. Badkan (phlegm) sustains body and produces sleep. It is responsible for movement of joints, muscles and confers patience. Its' aqueous element is associated with bodily fluids.

According to gSo-ba Rig-pa, disturbance or imbalance in any of these three elements leads to diseases and ill health. The diagnosis of the diseases is made through history taking, pulse reading and urine examination.



Pulse reading

The patients are treated with medicines and different therapies such as golden and silver needle insertion, blood letting, herbal steam application and bath, cupping, moxabustion, massage etc.

The National Traditional Medicine Hospital in Thimphu alone treats more than 40,000 patients annually and the figures are growing every year. So is the case with district TM Units. The Traditional medical system serves as complimentary to the modern medical services and is housed in the same hospital and BHU building. This allows cross referrals between the two systems and also offers a choice for the patients.

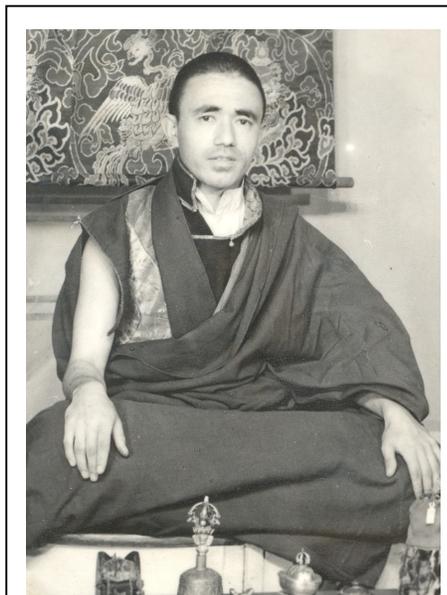


Therapy Unit

National Institute of Traditional Medicine

The training programme for the sMenpa was started in 1971 at Dechencholing Dispensary as on-the-job training, as per the Resolution No. 11 of the 32nd National Assembly held on 29th May 1970. In order to improve the quality of traditional medical services and to promote the study of gSo-ba- Rig-pa., the fourth Druk Gyalpo, His Majesty King Jigme Singye Wangchuck commanded to introduce training programme for the Drungtsho. Accordingly, the training programme for Drungtsho was started in 1978 with an appointment of Ladakh Amchi as Principal as per the Royal command. The Indigenous Dispensary was upgraded to national Indigenous hospital and shifted to the present site at Kawang Jangsa in 1979.

Since its inception in 1971, the Institute has trained 47 Drungtshos, 63 sMenpas, 12 Pharmacy Assistants and 11 Research Assistants. The Institute will continue to train Drungtshos and sMenpas as required by the Ministry of Health. The Institute will also train Pharmacy Technicians and Research Technicians in collaboration with the Pharmaceutical and Research Unit as and when required. The focus during the next five years is to improve the quality of



Late Drungtsho Ladak Amchi

training programs through appropriate faculty development and procurement of required teaching learning materials. The Institute will also plan and implement in-service training programs for the qualified Drungtshos and sMenpas to improve the quality of services. The NITM has become a federated college of the Royal University of Bhutan in and follows University programmes in relation to academic requirements. As per the compact signed between NITM and RUB, the Institute is expected to increase the student intake and the infrastructure to accommodate the increased number of student is being built.

Although, human resource development for the traditional medical services at present is based on the actual service delivery needs of the Ministry of Health, it is expected to change in the future. The rapid socio-economic and political development of the country and the population growth and demographic changes will spur the need for more traditional

medical practitioners in the country. There is also a growth in popularity world wide for the alternative medicine and our kind of traditional medicine is one of the popular system. Therefore, there is great scope to increase the intake of students to meet the growing demands. Similarly, the privatization and private practice policies of the Royal Government are likely to be changed in due course of time. All these changes will create more demand for quality traditional medical practitioners.

At present, the gSo-ba Rig-pa education is available only in Dzongkha and Choekye and it limits recruitment of overseas students. If we can develop international program of the gSo-ba Rig-pa in English, it will attract many foreign students and bring in much needed revenue to the country through tuition fees.

Academic Programmes:

Drungtsho Course.

The duration of training for Drungtsho is 5 years after class 12 and they receive Bachelor’s Degree in Traditional Medicine on successful completion of the training programme. The programme is validated by the Royal University of Bhutan and is also recognized by Bhutan Medical and Health Council. The current medium of instruction is in Dzongkha



and Choekye. The number of student intake is based on the requirements of the Health Ministry and the job is guaranteed after the training.

sMenpa Course

The sMenpa course is 3 years after class 10 and they receive a Diploma in traditional medicine after the training. The number of student intake is based on the requirements of the Health Ministry and the job is guaranteed after the training. This program is also recognized by the Bhutan Medical and Health Council. The medium of instruction is in Dzongkha and Choekye.

Pharmacy Technicians

Pharmacy Technicians course is for 2 years after class 10 and is conducted in coordination with Pharmaceutical and Research Unit as on the job training. The medium of instruction is English and the Ministry of Health employs all of them after the training.

Research Technicians

It is a 2 years certificate programme after class 10 passed and is conducted as and when required. The raining mechanism is same as Pharmacy Technicians.

Summary of current training programmes:

Category	Entry Qualification	Training duration	Award
Drungtsho	Class 12 passed	5 years	Degree
sMenpa	Class 10 passed	3years	Diploma
Pharmacy Technician	Class 10 passed	2years	Certificate
Research Technician	Class 10 passed	2years	Certificate

Note: The current academic year is from July to June

In addition to the above training programmes, the NITM is also responsible for organizing and conducting in-service training programmes for the traditional medical practitioners in order to improve the quality of traditional medical services.

At present there are 9 lectures and most of them are graduates of NITM and have not attended the required training in teaching. Although, there is a plan to enhance the technical capability of faculty members, the scope for further training especially at the Masters level is limited due to non-availability of appropriate Institutes. The teaching faculty is supported by 12 administrative staff and there is a student body of 53 at present.

Pharmaceutical and Research Unit



Pharmaceutical and Research Unit

In the past all medicines were produced manually. Small scale mechanized production started only in 1982 with support from World Health Organization. From 1998 onwards, the manufacturing Unit was upgraded to the Pharmaceutical and

Research Unit (PRU) through EC funding and now all products are produced mechanically following Good Manufacturing Practice (GMP) with more emphasis on Quality Control. 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.

As Traditional medicines are an integral part of the national healthcare system, timely supply of effective traditional medicine in sufficient quantity plays a crucial role in the delivery of quality services. With the commissioning of the Pharmaceutical and Research Unit, shortage of traditional medicines has been significantly reduced.

The Pharmaceutical and Research Unit has three main sections:-Production, Research and Quality Control and Marketing.

Production section

This section is responsible for the collection of raw materials and manufacturing of traditional medicines based on the traditional formula using latest production technology. The medicines are manufactured based on Good Manufacturing Practices (GMP) guidelines and Standard Manufacturing Instruction (SMI).

According to gSo-ba Rig-pa, more than 2990 different types of raw materials are used in traditional medicine. However, at present about 265 different types of raw materials are used to produce 108 compounds of which 98 products constitute the essential list of traditional medicines. About 85% of raw materials are available within the country and remaining 15% are imported from India. The raw materials are classified into:

sNgo-sMen – High altitude medicinal plants

- Throg-sMen** – Low altitude medicinal plants
- Sa-sMen** – Mineral origin
- Sog-cha-sMen** – Animal origin

The section currently produces approximately 9 metric tons of traditional medicines and meets the requirement of district Traditional Medicine Units and the National Traditional Medicine Hospital in Thimphu. In addition, it also produces a dozen of herbal products for the local market. 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.

Although there is an abundance of wild medicinal plants available at present, it is difficult to collect them as they mostly grow in remote and dangerous locations.

Today one of the challenges we face is the lack of proper drying system and hence retention of quality of herbs after harvest. The problem is complicated by the fact that the collection time coincides with peak monsoon season, when the humidity is highest and the sunshine is a rare experience. This contributes to wastage of herbs on one hand and deterioration of quality on the other.

To facilitate the drying, a mini hydro power plant was set up at Lingshi but the capacity of only 10 kilowatt energy generated is inadequate. This impacts the supply of both quality and quantity of traditional medicines around the country.

Traditional Medicine production in 2009

Sl.No.	Dosage	Compounds	Qty.kg
1	Pills	29	2905.25
2	Tablets	28	3033.253
3	Capsules	32	1754.16
4	Powder	5	216.8
5	Drop	1	30
6	Medicated Ointment	6	456.7
7	Herbal mixture	1	521
8	Syrub	1	300
9	Hot compression	1	50
	Total		9267.163

Sustainable Production of Traditional Medicine

To sustain the production of Traditional Medicine, Lingshi under Thimphu and Langthel under Trongsa were selected as collection sites for high altitude and low altitude medicinal plants respectively. Of the total 20.51 tons of raw materials procured in 2009, about 85% of it is collected within the country. Perhaps medicinal plant collection may be one of the first economical activities initiated and sustained in this highland.



Dr. Jigmi Singay, Ex Health Minister and his team in Lingshi checking the medicinal plants collection sites

While other highlands like Gasa, Ha and Bumthang are being explored to introduce as alternative collection sites, Lingshi has been collection centre for high altitude medicinal plants since 1967. Medicinal plants are collected by the local

community and sold to PRU either at the drying centres or at the unit.

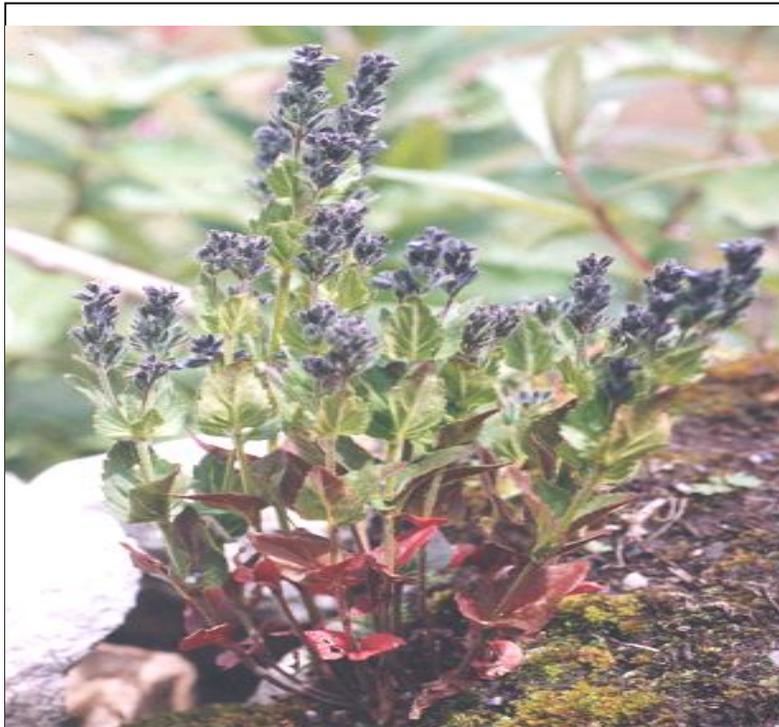


Jagoe Poe - a plant substitute for deer musk

As sustainability is essential in the long run, Community Based Sustainable Management of Medicinal Plants has been established and farmers are being educated in the sustainable collection and cultivation. The intention is to promote and encourage farmers to grow medicinal herbs as cash crops like fruits and vegetables. Some species of medicinal plants are already introduced for cultivation in collaboration with the Medicinal and Aromatic Plants division of Ministry of Agriculture.

The ongoing second phase of the EC project further focuses on the technical and organizational methodologies development for sustainable conservation, collection and /or domestication of a range of high altitude medicinal plants as well as on the development of medicinal plants industry at all

levels including sustainable collection and /or production and marketing of herbal products. This would enable PRU to function as a self-sustaining commercial entity in the future. To render the unit financially self reliant, marketing has been instituted and at present we have one product on national market and six products at local (Thimphu) market. In addition, export opportunities are being explored for future prospects of the Unit.



Domna Domthri - a plant substitute for Bear Bile

With farsighted vision of our leaders, we manage to keep our environment intact, if we are to reap dividend from our rich heritage, we need to take cautious developmental strides. Traditional Medicine and natural resource based research presents a great potential. However, building leadership in

research and drug development is a resource and knowledge intensive activity and must accord top priority and capacity building given due importance. Now with the start of EC Project Phase II, we hope to initiate some product development activities and PRU has already identified few product groups that it intends to carry out within this project period.

Research & Quality Control section

This section is responsible for assuring quality and assessing the efficacy and safety of the traditional medicine produced. 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 Quality Control 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

For any drug research, the core component is the pre-clinical and clinical studies. Such studies will tell us quantitatively how effective our formulations are. It will also help us to explain the probable mechanism of action. Without acquiring proper pre-clinical data with accepted protocols, we cannot move on to clinical phase of studies and without clinical data, population willing to accept our formulation will dwindle with time.

Main activities of Research and Quality Control section

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. Building monographs on each medicinal plant used in the production of traditional medicine.
4. Drug efficacy and stability trails.
5. Survey and documentation of medicinal plants, including herbarium specimen collection.
6. Survey of medicinal and hot springs in the country and identification of their medicinal values.
7. Establishing therapeutic value indices of medicinal plants.
8. New product development trials.

Under Research and Quality control section there are several sub-sections each one with their own specializations and functions.

The **Quality control** section is responsible for assuring quality of the medicine by implementing the set quality parameters independent of Production. Besides this routine quality checks, QC section monitors the stability of traditional medicine on the shelf-life, co-ordinates product recalls in case of adverse drug reactions. It is also responsible for the validation and monitoring of standard manufacturing instruction which is part of GMP.

Pharmacognosy section studies the cells and tissues of the raw materials that needs authentication and standardization, and authenticated raw materials for monograph building. The section in co-ordination with ethno-botany, also studies the species variation at the cellular level and through physio-chemical studies.

The **pharmacology** section is responsible for the scientific

validation of traditional drug efficacy by developing appropriate disease models for in vitro, in vivo and clinical studies.

The present activities of this section include screening of traditional drugs and medicinal plants of Bhutan for any anti-microbial activities by developing bioassays for anti-microbial screening, adverse drug reactions, evaluation and research of



clinical information on disease pattern, drug consumption etc. This section is also involved in the documentation of various traditional therapies including Tsa-chus (hot springs) and sMenchus (medicinal water). The section also carries out basic operational research from time to time in coordination with other sections when new products are developed and released for trial.

In future we would like to initiate and institute in vivo

bioassays for drug screening as well as toxicity studies. We also like to develop cellular and molecular techniques for screening traditional drugs, medicinal plants and other chemicals for useful therapeutic properties.

Phytochemistry section screens the potential plant materials through chemical extractions. The major task of this section is the extraction and identification of main chemical constituents present in different extracts. The extracts are then preserved for authentication/standardization and quality control purposes. The extracts with potential are provided to different sections for further research. This section also sets the quality parameters to be adopted by the quality control section by running through different instruments and method validation. The other activity of this section includes development and validation of pre-processing/detoxification methods.

Ethno-botany section is responsible for the research on ethnic uses of medicinal plants, authentication of plants through botanical studies, and standardizing as per traditional texts. This section is also responsible for developing and maintaining medicinal plant herbarium in the unit. In addition this section carries out survey on species diversity, distribution and population robustness of medicinal plants that are being used in the manufacture of traditional medicine as well as those plants, which are proven to be of medicinal value.

Marketing Section

Marketing activities were initiated since 1998 onwards. 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. There are also few new products in the process of development.

Besides marketing our products, the regional markets of SAARC countries will be explored for sourcing the low



altitude medicinal plants and other ingredients to have a competitive raw material sourcing strategy. SAARC region is a vast source of medicinal plants and herbal products. Opportunities for two way trade relation in both raw herbs as well as finished herbal products exist to be explored.

It is anticipated that the PRU would become a self-sustaining, and a dynamic profit centre of the Royal Government with operational autonomy, producing and supplying traditional medicines and herbal products of international quality standards (Cost effective, safe, and of high therapeutic value). With the assistance from EC under project phase II, marketing activities are expected to pick up. A marketing strategy and a plan to market products both in the domestic and international markets will be developed based on the capacity of the Unit. The market studies will also be conducted within the region and in international markets.

Marketing of the commercial products in 2009

S.No.	Product name	Unit sales	Value (Nu)
1	Tsheringma safflower	2398 Pkts	215820
2	Cordy PLUS	492Bttls	492000
3	Cordy ACTIVE	296 Bttls	355200
4	Men-sang (incense powder)	1994.70Kg s	532154
5	Calming incense sticks	504 Pkts	73350
6	Protecting incense	646 Pkts	94,650
7	Purifying incense sticks	832 Pkts	122550
8	Rinchen sna 5	-	-
9	Rinchen sna 7	90 Pkts	68400
10	Bres-3-phyema	41.25 Kg	5755
11	Man-drup-phyema	522 Kg	289710
12	Zang-dru-phyema	86.25 Kg	60695
13	Bumzed 25	337 Pkts	50550
14	Massage oil	-	-
15	Yung-ba-chi-thang	177 Bttls	5310
16	Raw Materials	19610 Kg	44460.60
17	Post Cards	117 Nos	35100
	Total		1913550

Revolving Fund

The Revolving Fund under the Institute of Traditional Medicine Services is a very important and critical source of money for the PRU in producing the traditional medicines required for healthcare services to the people. Its significant contributions are often un-noticed and un-known within the MoH in particular and within the government in general. Through the Fund, we are able to procure all the raw material needs for traditional medicine productions.

The Revolving Fund was established in 1996 to procure medicinal ingredients & raw materials for TM production and to gradually transform PRU into a financially-self-sustainable entity. Over the years, the objectives and scope of the Fund have been widened and they have evolved with the changing times through successive management board meetings of the Fund.

The initial mandates of the Revolving Fund were to:

1. Pay for all the raw material purchases required for the production of traditional medicines
2. Accept any sales proceed whether domestic or export as income of the Unit

The current areas of fund utilization are:

1. Purchase of medicinal raw materials (medicinal plants, minerals, animal parts and precious substances)
2. Purchase of consumables for production (containers, packaging materials, labels, gunny bags)
3. Research & Development (small-scale research & publications, product development,)
4. HRD (short term trainings as per approval of the Board)
5. Product promotion and publicity (advertisements, product launch)

6. Short and medium term investments (Staff loan, Fixed deposit, shares)
7. Other related expenses- as and when approved by the Board (such as daily wages, refreshment and other expenses for conducting Board meetings)

Revolving Fund Status: 2005 to 2009

Fiscal Year	Opening Balance	Receipt	Expenditure
2005	2574209.00	5883901.28	976952.95
2006	4505496.00	9367892.86	7162187.53
2007	4933269.00	10732798.56	10432561.71
2008	6651195.00	5659788.00	7742474.00
2009	6579677.00	13295529.59	9341417.00
Total		44939910.29	35475593.19

The Revolving Fund is managed by a board under the chairmanship of the Director, ITMS and at least 2 board meetings are held in a year. The current management board members are comprised of 3 officials from the MoH and 3 from within ITMS.

Conclusion

The traditional medicine system in this country has come a long way since its inception in 1967 due to strong political commitment of the Royal Government of Bhutan. It is one of the most sustainable methods for the health care delivery system, as all traditional medicines are manufactured in Bhutan, and the human resources are developed within the country.

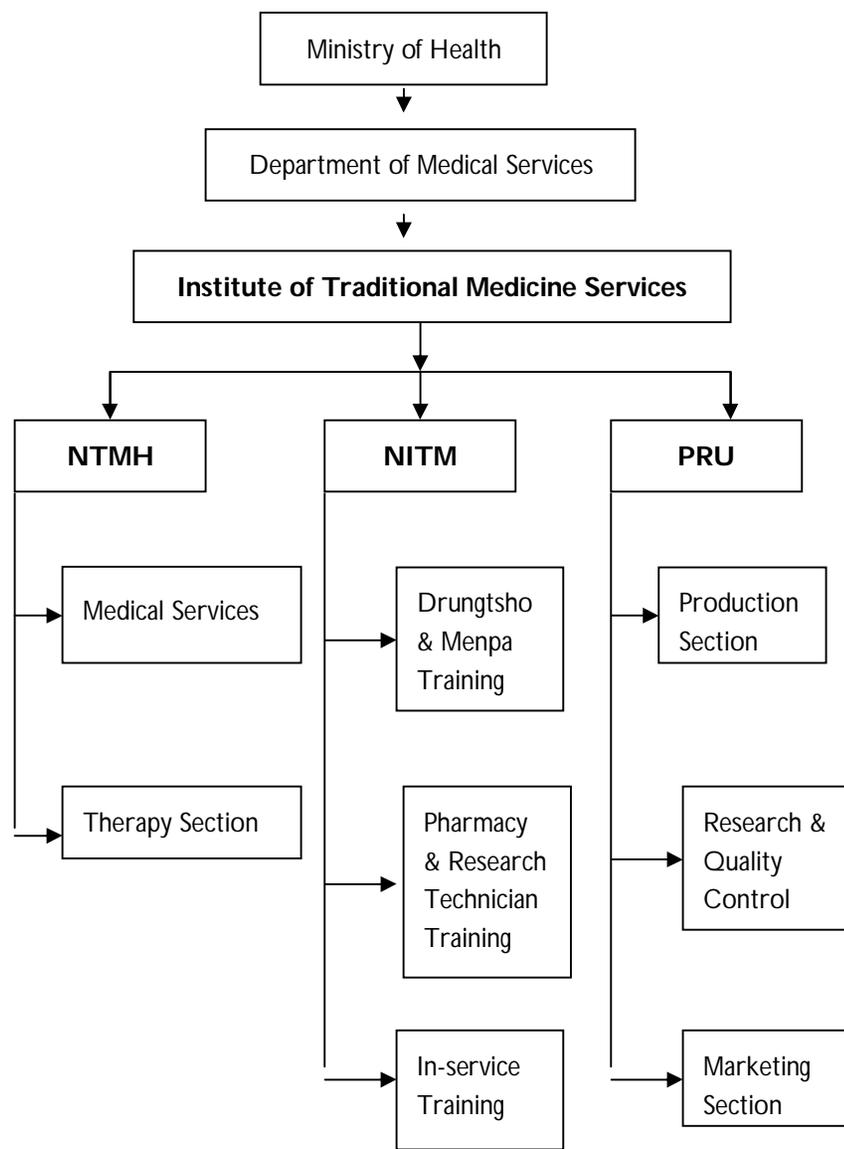
The Traditional Medicine Services in Bhutan is fully integrated with modern health care delivery system and is available in all 20 district hospitals. There is a plan to establish Traditional Medicine Units in all Basic Health Units in the country. This change of Government policy would require heavy investment in the traditional medicine services for the development of human resources and for the production of traditional medicines. Currently, the Institute does not have a separate teaching and academic block and there is no scope to increase the number of enrollment for Drungtsho and sMenpa training. The production capacity of the Pharmaceutical and Research Unit also needs to be upgraded in terms of raw material collections, production machines and materials and space to meet the growing demand of Traditional Medicines. The National Traditional Medicine Hospital does not have adequate space for the providing different therapies.

Further there is a need to build adequate infrastructures for all three units of the Institute of Traditional Medicine Services in order to fulfill its mission for the development of human resources for traditional medical services, production of traditional medicines and for the provision of quality traditional medical services. The major challenges for traditional medicine services are to mobilize adequate resources for the infrastructure development and for introducing post graduate programmes in Traditional Medicine.

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ORGANOGRAM OF ITMS**STAFF STRENGTH IN 2010****General Administration:**

Sl. No.	Name	Position Level	Position Title
1.	Ms. Tenzin Wangmo	P3A	Information Officer
2.	Mr. Dawa Tashi	S3 A	Sr. Store In-Charge
3.	Ms. Dorji Wangmo Lhaki	S3 A	Adm. Assistant I
4.	Mr. Karma	S4 A	Adm. Assistant II
5.	Mr. Ugyen Wangdi	S4A	Plumber
6.	Ms. Tashi Yangzom	S3 A	Electrician
7.	Mr. Thinlay Jamtsho	O1 C	Office Assistant
8.	Ms. Dema Yangzom	O4 A	Tele. Operator II
9.	Mr. Tempa	O1 A	Driver
10.	Ms. Chimi Dema	O1A	Dispatcher I
11.	Mr. Jagat Bdr. Tamang	O4	Driver III
12.	Ms. Namgay Pemo	GSC II	Messenger
13.	Ms. Tshulthrim Zangmo	ESP	Gardener
14.	Mr. Lobzang Tashi	ESP	Night Guard
15.	Mr. Sangay Wangdi	GSC I	Day Guard
16.	Ms. Tshering Yuden	GSC II	Wet Sweeper
17.	Ms. Sangay Wangmo	GSC II	Wet Sweeper

National Traditional Medicine Hospital:

1.	Drg. Tshering Tashi.	P1 A	Medical Supdt.
2.	Drg. Kunzang Wangchuki	P1 A	Chief Tra.Physician
3.	Drg. Gembo Dorji	P1 A	Chief Tra.Physician
4.	Drg. Ugyen Tenzin	P1 A	Chief Tra.Physician
5.	Drg. Karma Gaylek	P2 A	Dy. Chief Physician
6.	Drg. Dorji Uden	P2 A	Chief TraPhysician
7.	Drg. Pema Choden	P4 A	Trad. Physician
8.	Drg. Dorji Nidup	P4 A	Trad. Physician
9.	Drg. Karma Ugyen	P4 A	Trad. Physician

10.	Drg. Sangay Thinlay	P4 A	Trad. Physician
11.	Mr. Nado	P5 A	Sr. sMenpa
12.	Mr. Nima Dorji	S1 A	sMenpa II
13.	Ms. Phub Dem	S2 A	sMenpa
14.	Mr. Namgay Lhendup	S2 A	sMenpa
15.	Mr. Tshering Wangchuk	S2 A	sMenpa
16.	Mr. Dawa	P5 A	sMenpa I
17.	Mr. Pema Tashi	S1 A	sMenpa
18.	Ms. Kezang Choden	O2 A	Receptionist I
19.	Ms. Tashi Wangmo	O3 A	Receptionist II
20.	Ms. Neten Zangmo	GSC I	Therapy Aid
21.	Mr. Gato Doya	ESP	Therapy Helper
22.	Mr. Sangay Wangdi	GSC I	Day Guard
23.	Mr. Lobzang Namgay	GSC II	Therapy Assistant
24.	Ms. Tulasa Devi Acharya	GSC II	Therapy Assistant
25.	Ms. Tshering Yuden	GSC II	Wet Sweeper
26.	Ms. Sangay Wangmo	GSC II	Wet Sweeper

National Institute of Traditional Medicine:

1.	Mr. Dorji Wangchuk	EX3 A	Director (Tertiary)
2.	Drg. Dophu	P1 A	Dean Std Affairs
3.	Drg. Phurpa Tshering	P1 A	Chief Lecturer
4.	Drg. Ngawang Zangpo	P1 A	Sr. Lecturer
6.	Drg. Tendrel Wangdi	P2 A	Lecturer
7.	Drg. Dawa Tashi	P2 A	Lecturer
8.	Drg. Sangay Wangdi	P2 A	Lecturer
9.	Drg. Tempa Gyeltshen	P2 A	Lecturer
10.	Drg. Leki Wangchuk	P4 A	Lecturer
11.	Ms. Namgay Lhamo	P2 A	Lecturer
12.	Ms. Pema Zangmo	P5 A	Asst. IT Officer
13.	Ms. Anju Pradhan	S3 A	Account Assistant
14.	Mr. Lhundupla	S5 A	Adm. Assistant
15.	Mr. Badal Tamang	S5 A	Adm. Assistant
16.	Ms. Sonam Tshomo	S5 B	Asst. Librarian
17.	Mr. Tashi Tenzin	O3 A	Driver
18.	Mr. Ku Dorji	O3 A	Driver
19.	Ms. Tshering Yuden	GSC II	Messenger

20.	Mr. Sangay	GSC II	Cook
21.	Mr. Norbu Wangdi	GSC II	Cook
22.	Ms. Tshering Zangmo	GSC II	Wet Sweeper
23.	Ms. Pema Choden	GSC II	Wet Sweeper

Pharmaceutical and Research Unit:

1.	Drg. Yeshe Dorji	P1	Chief Trad. Physician
2.	Mr. Kinga Jamphel	P2	Dy. Chief Pharmacist
3.	Mr. Ugyen Dendup	P2	Dy. Chief Pharmacist
4.	Mr. Sherab Tenzin	P3	Sr.P pharmacist
5.	Mr. Phurba Wangchuk	P3	Sr. Research Officer
6.	Mr. Jigme Thinley	P4	Trad. Clinical Asst. I
7.	Mr. Shacha Gyeltshen	P4	Engineer
8.	Mr. Sonam Wangchuk	P5	Marketing Officer
9.	Mr. Tashi	P5	Sr. Research Asstt. I
10.	Mr. Samten	P5	Sr. Research Asstt. I
11.	Mr. Nado Tshering	P5	Asst. Engineer I
12.	Mrs. Tenzin Wangmo	P5	Asst. Marketing Officer
13.	Mr. Jigme Wangdi	P5	Sr. Medical Tech. I
14.	Mr. Pema Jamtsho	P5	Sr. Medical Tech. I
15.	Mr. Pema Wangchuk	P5	Sr. Medical Tech. I
16.	Mr. Jamyang Loday	S1	Trad. Clinical Asstt II
17.	Mr. Chhimi Jamtsho	S1	Medical Tech. I
18.	Mr. Singye Wangchuk	S1	Medical Tech. I
19.	Mr. Karma Wangchuk	S1	Research Asstt. I
20.	Mrs. Tshering Zam	S1	Research Asstt. I
21.	Mrs. Norbu Dolma	S1	Research Asstt. I
22.	Mr. Kencho Tenzin	S2	Research Asstt. II
23.	Mr. Sangay Wangchuk	S2	Medical Tech. II
24.	Mr. Sangay Tempa,	S2	Medical Tech. II
25.	Mr. Sherab Phuntsho	S2	Medical Tech. II
26.	Mrs. Goma Rai	S2	Medical Tech. II
27.	Mr. Dendup Penjor	S2	Research Asstt. II
28.	Mr. Kinley Dorji	S2	Research Asstt. II
29.	Mr. Kinley Penjor	S2	Medical Tech. II
30.	Mr. Sonam Nidup	S3	Medical Tech. III
31.	Mr. Yeshe Tobgay,	S3	Medical Tech. III
32.	Mr. Yeshe Gyeltshen	S3	Medical Tech. III

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|-----|---------------------|-----|------------------------|
| 33. | Mr. Sonam Tshering | S3 | Medical Tech.III |
| 34. | Mr. Tshewang Rinzin | S3 | Medical Tech.III |
| 35. | Mrs. Namgay Lhamo | S5 | Adm.Asstt.II |
| 36. | Ms. Kencho Lhazom | S5 | Sr. Telephone Operator |
| 37. | Mrs.Sonam Choden | S5 | Lab Asst. |
| 38. | Mrs. Chey Chey | S5 | Lab Asst |
| 39. | Mrs.Singay Wangmo | GIC | Sale girl |
| 40. | Mr. Dechog Wangdi | ESP | Helper |
| 41. | Mr.Sangay Penjor, | GSP | Helper |
| 42. | Mrs. K M Gurung, | ESP | Sweeper |
| 43. | Mrs. I.K Gurung, | ESP | Sweeper |
| 44. | Mr. Yeshi Gyeltshen | ESP | Security Guard |
| 45. | Mrs.TsheringZangmo | GIC | Sweeper |
| 46. | Kunzang Choden | ESP | Gardener |



Gangyul village in Lingshi, where medicinal plants are collected



Medicine Buddha Mandala