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ROYAL AUDIT AUTHORITY



Audit on Medical Waste Management



Environment

Audit

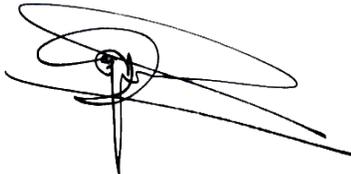
Report

Reporting on Economy, Efficiency & Effectiveness

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We would like to acknowledge the cooperation and assistance extended to the audit team by the officials of the two hospitals and other relevant agencies which facilitated the timely completion of audit.

Yours respectfully,



(Ugen Chewang)

Auditor General

Copy to:

1. The Hon'ble Prime Minister, Royal Government of Bhutan, Thimphu;
2. The Hon'ble Minister, Ministry of Works and Human Settlement, Thimphu
3. The Hon'ble Minister, Ministry of Finance, Tashi chho Dzong, Thimphu;
4. The Hon'ble Minister, Ministry of Home and Cultural Affairs, Tashi chho Dzong, Thimphu;
5. The Hon'ble Deputy Minister, National Environment Commission, Thimphu;
6. The Secretary, Ministry of Health, Thimphu;
7. The Secretary, GNH Commission, Thimphu;
8. The Secretary, Ministry of Works and Human Settlement;
9. Dasho Dzongdags of all 20 Dzongkhags;
10. Executive Secretary, Thimphu City Corporation
11. Thrompon, Phuentsholing City Corporations
12. Chief Medical Officer, RBA (HQ), Lungtenphu
13. The Medical Superintendent, JDWNRH, Thimphu;
14. The Medical Superintendent, Phuentsholing General Hospital, Phuentsholing;
15. The Medical Superintendent, Regional Referral Hospital, Mongar;
16. The Medical Superintendent, Gelephu General Hospital, Gelephu;
17. The Medical Superintendent, Samtse General Hospital;
18. District Medical Officers (DMO), Bumthang, Tsimalakha, Lhuentse, Paro, Pemagatshel, Punakha, Samdrupjongkhar, Samtse, Gomtu, Sipsoo, Sarpang, Gidakom, Trashigang, Riserboo, Trashiyangtse, Trongsa, Tsirang, Yebilaptsa
19. The Chief Audit Officer, SCID, RAA, Thimphu.
20. PPAARD, RAA, Thimphu

*"Every individual must strive to be principled. And individuals in positions of responsibility must even strive harder."
- His Majesty The King Jigme Khesar Namgyel Wangchuck*

TITLE SHEET

1. REPORT : Report on Medical Waste Management of JDWNRH, Thimphu and Phuentsholing General Hospital

2. EXECUTING AGENCY : JDWNRH and Phuentsholing General Hospital, Ministry of Health, Thimphu.

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5. SCHEDULE OF AUDIT : December 2007 to February 2008

6. NAME OF INSPECTING TEAM:

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CONTENTS



1.	Executive Summary.....	1
2.	Introduction.....	4
3.	Overall common observations.....	6
4.	Observations- JDWNRH, Thimphu.....	10
5.	Observations- Phuentsholing General Hospital.....	14
6.	Recommendations.....	16

Every Bhutanese is a trustee of the Kingdom's natural resources and environment for the benefit of the present and future generations and it is the fundamental duty of every citizen to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, visual and physical pollution through the adoption and support of environment friendly practices and policies".

The Constitution of the Kingdom of Bhutan

DISCLAIMER NOTE

The coverage of this audit does not include financial auditing. The audit was confined to management of medical waste within JDWNRH, Thimphu and Phuentsholing General Hospital. The audit was conducted in conformity with economy, efficiency & effectiveness of the activity. This audit was based on Audit Planning set by the Royal Audit Authority and facts & information made available and accessible to the audit team by the Hospital authorities.

This is also to state that the auditors during the audit had neither yielded to pressure, nor dispensed any favor or resorted to any unethical means that would be considered as violation of the Royal Audit Authority's Code of Good Conduct, Ethics and Secrecy.

1

Executive Summary

***Why audit
medical waste?***

Medical waste is a small fraction of municipal waste stream. They are considered as special wastes wherein it requires careful management due to its inherent characteristics and compositions. Unlike solid waste, medical wastes are highly infectious and need special treatment before being disposed off or incinerated. According to WHO, approximately 10% of medical wastes are infectious while another 5% are hazardous. Besides such health hazards, proper management of medical waste could also aid in the respective municipalities' effort in keeping the town clean.

With the pace of development in the country, several new hospitals are being built while the existing ones are being upgraded. The Phuentsholing town boasts of a new hospital while Thimphu residents are eagerly waiting for the new 350 bedded hospital. Therefore, the Royal Audit Authority (RAA) found it appropriate and timely to conduct a proper study of medical wastes generated by the above two hospitals. The study was conducted mainly from the perspective of *performance auditing*.

Besides, the findings and recommendations from this study could also be spread over and replicated to many other hospitals and Basic Health Units which are located in other parts of the country.

The main objectives of this audit were:

- To see whether the composition and quantities of wastes generated were recorded;
- To see the existence of waste management system and assess their effectiveness;
- To identify opportunities for improving the current waste management system.

What RAA found?

In order to achieve the above objectives, the Royal Audit Authority took up the study of the medical wastes generated by Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) in Thimphu and Phuentsholing General Hospital. The review of policy documents and files, observations, walk-through tests, questionnaires and interviews revealed that there were several issues common to both the hospitals, with few specific ones. Accordingly, the findings have been categorized as common and specific to each hospital.

The overall findings of the RAA have been briefly summarised as hereunder;

- The composition and the quantities of wastes generated by the hospitals have not been documented;
- Although general guidelines on managing medical wastes exist, they were not transformed into rules and regulations. Therefore, the accountability in managing medical waste is generally lacking.
- Management of waste was often thought to be a secondary assignment by the hospital staff. In a questionnaire response, many felt that a dedicated team should be appointed if medical waste has to be managed properly;
- There was lack of knowledge and awareness amongst the cleaners and ward persons on the management of medical waste. Many of them were found handling wastes without protective gears. Laboratories workers were provided with protective gears which could not fully protect them from work hazards.
- Autoclaving of waste at JDWNRH was found to be done in a normal waste containing polythene bag instead of specially designed autoclaving bags.
- No procedures were in place to deal complaints and cases related to the Occupational Health and Safety (OHS) and Hospital Acquired Infections (HAI);
- The hospital managements felt that since waste management is not their core function, it often did not get the budgetary support from the government.

The detailed findings are provided in Chapter 3, 4 and 5 of this report.

What RAA recommends?

With the construction and upgradation of several hospitals and BHUs in Bhutan, managing medical waste in most scientific manner cannot be ignored. If appropriate steps are not taken now, the problem might

become unmanageable in future.

In view of this and based on the study, the RAA tried to provide certain recommendations in the proper management of medical wastes. The recommendations put forth by the RAA are the outcome of the audit conducted within a particular period and based on the information provided at that point of time. The recommendations have been summarised as given hereunder;

- The compositions and quantities of waste generated from the individual hospitals should be properly documented for future studies related to medical wastes;
- The Ministry of Health needs to formulate rules and regulations in line with the policy document for Solid Waste Management 2006.
- The Ministry should also form a dedicated team to monitor the implementation of the rules and regulations. The present Committee were not able dedicate enough time for monitoring.
- More structured training and awareness programmes need to be organised for people handling medical waste, especially the ward persons and cleaners.
- Patients and their attendants need to be made aware of the concerns and problems associated with medical waste, through awareness sign boards and brochures.
- National Environment Commission (NEC), as a nodal agency for environment, need to backstop hospital management in technical aspects of waste management and monitor their effectiveness from time to time.

The detailed recommendations are provided in Chapter 4 of this report.

2

Introduction

The need for management of medical waste was felt as early as 1970s when medical wastes including syringes and bandages were washed up on the east coast beaches of USA. This was followed by public outcry and based on which the US Government came out with the US Medical Waste Tracking Act (MWTAA) in 1988. With the increasing quantities of medical waste and their associated risks to humans, today medical waste management has become a growing concern all over the world.

There is no denying to the fact that hospitals do generate lot of wastes. In India, it is estimated that an average of 1 – 2 kg of wastes are being generated by every bed in the hospital. According to WHO, approximately 10% of medical wastes are infectious while another 5% are hazardous wastes.

With the growing number of hospitals of varying sizes including the construction Regional Referral Hospital at Gelephu and several district hospitals and public health laboratories in the 10th Five Year Plan, Bhutan cannot afford to remain isolated from such growing problem.

Achievements

Acknowledging the need to efficiently manage medical waste, the hospitals management had always put its maximum effort to manage waste within the limited human and financial resources. Ministry of Health had recognized the need to effectively manage the medical waste and came out with a policy document titled **Policy Framework for Solid Waste Management, 2006**. The documents comprehensively mentions about the hazards of medical waste and the ways to handle each of them. Accordingly, they have formed a Committee to monitor the waste management system. JDWNRH had also done away with the incineration and recently installed an autoclave capable of autoclaving all solid infectious waste generated from the hospital. A few awareness programmes were also done by the hospital managements.

With the main objective of assessing the medical waste documentation procedures and waste management systems and to identify opportunities for improving the medical waste management system in the country, the RAA undertook this environmental audit.

Since the functions and other administrative procedures followed by the various hospitals in Bhutan are similar, the RAA selected the two major hospitals from two most populated cities of Bhutan i.e. Thimphu and Phuentsholing. Therefore, all the observations and recommendations are based on the audit of medical waste of the Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) and Phuentsholing General Hospital. However, as stated earlier, the findings and the recommendations from this audit could be spread over and replicated to many other hospitals and Basic Health Units which are located in other parts of the country.

3

Overall Common Observations

3.1 Non availability of inventory/ data on waste

Waste Management records were found to be limited, incomplete and almost non-existent. It was found that both hospitals have not maintained any records on the medical waste management. In absence of such records, the audit team could not ascertain the quantities and the composition of waste generated by the hospitals and whether they have been disposed in the recommended way.

Maintaining an up to date data on waste generated by the hospitals could facilitate studies and research on the management of medical waste.

According to the hospital management such data could not be maintained due to lack of dedicated person/persons for such a purpose. The respondents to questionnaires (nurses, the medical officer, ward persons and cleaners) said that the hospitals are already facing shortage of manpower even for carrying out their routine jobs and do not have sufficient time for taking other responsibilities.

However, the RAA observed that no efforts have been made to recruit such dedicated person by the Ministry of Health. **It was also noticed that no internal audit was carried out.**

3.2 Absence of Rules and Regulations

The Ministry of Health published a document titled **Policy Framework for Solid Waste Management, 2006**, with detailed description of managing each of the wastes and their adverse impacts if not managed well. However, the procedures contained in the document were not translated into proper rules and regulations and therefore not put into practice. This had led to lack of proper accountability in waste

management system in the hospitals. Though many of them understood the importance of managing medical waste, they often felt that it is not their duty to manage it.

A set rules and regulations would direct all the parties concerned, be it the hospital or the staff employed, on the necessary steps to be taken in managing medical wastes. The formulation of rules would also infuse a sense of responsibility amongst the people managing medical waste.

3.3 Lack of monitoring by NEC & Hospital Authorities (IC & HWM Committee)

The National Environment Commission (NEC) is the body established as the principal agency responsible for harmonization, monitoring and administration of all environmental management issues in the country.

However it was learned that both hospitals had not received any monitoring visits either directly by NEC or by the Ministry of Health (MoH). Had there been any visit by the monitoring agencies, some kind of education in the form of technical guidance could have been derived from such visits, which in turn would help the staffs to take corrective or preventative measures related to medical wastes.

The only encouraging sign is that the Ministry of Health had formed a Committee on National Infection Control for monitoring waste generated from health care facilities in various hospitals. However, the achievements and the impact created by the Committee was negligible.

3.4 Lack of internal Control on Waste Management System.

During the audit of both the hospitals in Thimphu and Phuntsholing, it was found that there were no documented internal medical waste control systems. Interviews with the staff (ward persons and cleaners) revealed that they were not aware of the guidelines of medical waste management system.



There is no proper segregation of duties and assignment of specific responsibilities. Some instances were noticed when medical waste like sharps tubes and used attires were transported to the general landfill sites without segregating them, as shown in the picture above. Such practices pose serious threat to the waste handlers and communities residing nearby.

3.5 Use of protective equipments not in practice.

The hospital staffs (especially ward persons and cleaners) who are usually dealing with infectious medical waste are not always in the practice of using protective gear and equipment to prevent injuries and other health hazards.

When questioned most of the staffs were not aware of all the risk arising from not using the protective gears and equipment.

It was also noticed that safety and risk specification were not displayed in and around the hospital campus for awareness to the staff and general public.



Protective attire not being used in JDWNRH and P/ling Hospital

3.6 Disposal of Liquid Wastes

Though hospital authorities had installed waste autoclaving machine for infectious solid waste, liquid wastes were still being disposed off in unscientific manner. As of date, there were no measures to disinfect these wastes. A large quantities of these liquid wastes finally land up being spilled into the drains. For instance, the liquid waste generated

from radiology unit namely, developer and fixtures (picture on right) were disposed into the drain. Management stated that, in the past these waste products were taken by a recycling firm in India, but of late the same is being discontinued by the firm.



3.7 lack of training/workshop for staff

There is no official plan or programme for training the cleaners, ward boys and other low-level group of employees who are regularly associated with infectious wastes in the hospital. In the past there used to some kind of workshops for this category of employees but was discontinued thereafter.

In absence of such trainings/workshops, the employees will not be aware of legal and safety requirements, which could lead to injuries and possible claims in future.

3.6 Budget constraints & lack of manpower

According to the hospital management, the paucity of funds and lack of manpower were the main constraining factors for not being able to properly manage medical wastes. The management's view was also supported by the fact that 80% of the respondents (hospital employees) expressed similar view on a separately distributed questionnaire. The audit team studied the existing staff strength against the approved strength by Royal Civil Service Commission and found that the hospitals currently are facing acute shortage of manpower. Apparently, there also seem to be a budget constraint.

4

Observations – JDWNRH, Thimphu

4.1 Wastes not segregated

The Policy Framework for Solid Waste Management, 2006 published by the Ministry of Health prescribes colour coding of medical wastes as follows:

Colour of Bins	Contents of the waste bins
Yellow	Sharps, tubing, catheters, I/V sets
Blue	Food wastes
Green	Office waste, disposable cloths
Red	Infectious

Accordingly, the hospital authorities had initiated implementation as per the policy guidelines. However, while visiting the Thimphu hospital (JDWNRH) the team observed that no proper segregation is done at the point of origins or at the disposal site. Upon physically observing the waste handling by the staffs, the audit team noticed that the cleaners responsibility was just to collect the waste filled plastics from different wards, put it in the trolley and then finally transport it to the autoclave unit. In the auto clave unit, the autoclave operator also pays no heed for segregation and puts the plastics with un-segregated waste directly into the autoclaving machine.



As can be seen from the picture above that medical waste are not always placed in the prescribed medical waste bags. It is one of the indications of the lack of monitoring by the management on the general health and safety standards laid down in their policy frame work for waste management and other environmental legislations.

4.2 Unhygienic transportation of Medical waste

Questionnaires were distributed to the hospital officials and staffs regarding the carts used for transporting the medical waste within the hospital, between wards and the central storage place.

80.65% of the hospital employees felt that the carts were capable of transporting wastes, 35.48% felt that the carts were designed to prevent spills while 54.84% responded by stating the carts were constructed of materials that permit effective cleaning and disinfecting. Below is the picture of the trolley/cart used for transporting medical wastes.



Unsafe trolley used for carrying medical/infectious waste. No separate passage for transport of medical waste

However, as could be seen from the picture above, the trolleys used at the hospitals for transporting medical and other waste to the autoclave unit and the disposal bins were open, uncovered and congested which could pose health hazards to the employees and the general public. Ward persons and cleaners also complained of not having sufficient carts and some times having to carry wastes in the polythene bags itself.

Paths used for transporting wastes are the same ones as the pedestrian path and is usually transported at very odd hour i.e. 10 A.M.

4.3 Deficiencies in autoclaving of Wastes

Appreciating the ill effects of incinerating medical wastes, National Environment Commission and Hospital authorities had recently done away with the incinerator and installed a waste autoclave unit in the hospital campus. While the initiative was commendable, during the course of audit the following shortcomings were observed;

- **Improper autoclaving bags:**

Generally, infectious wastes are autoclaved in specially designed bags so as to fully disinfect it prior to disposal. In contrary, JDWNRH autoclaves its wastes in ordinary polythene bags that



are used for collecting wastes from different wards. Hospital authorities stated the unavailability of funds as major factor for the lapse.

- **Only one operator:** There is only one operator at present. During his absence, the machine remained closed and thus wastes have to be stored outside in open area.

- **No proper waste storage facility:** There is no proper waste storage facility near the autoclave unit. Wastes are usually stored outside and are easily accessible to both humans and animals.

- **Operators not using protective gear:** As could be seen from the picture, the operator was often not in the practice of using the protective gear though he seem to understand the hazards associated with handling medical wastes.



4.4 Improper Storage of Wastes

Physical observation of the various wards and other centres revealed that cleaners collect the waste from the waste bins and store it at awkward locations. As shown in the picture, wastes were found stored under the

stair cases. The location is easily accessible by anyone and provides a very unsightly scene. Upon enquiry, it revealed that wastes generated during the afternoons and the nights were stored to be transported the next day. Given the volume of wastes generated, such practice will continue until alternate solutions are explored.



4.5 Open Burning of wastes within the hospital premise

Despite clear direction from the Thimphu City Corporation to avoid burning of wastes, the JDWNRH had not stopped such practices and continues open burning of wastes inside the hospital premise as shown in the picture. During the physical observation of one such burning incident, it was observed that the authority burnt date expired drugs, kitchen wastes and other general wastes generated from the hospital. The hospital management had continued such practices.



5

Observations –Phuentsholing General Hospital

5.1 Unscientific disposal of medical waste

The Hospital administration, Phuntsholing usually disposes off all the infectious waste in a deep burial pit constructed within the campus.

However there was a lone case where liquid medical wastes were found dumped at the landfill site at Pasakha. Three out of six chambers were filled with such liquid wastes. The audit team along with the officials from City Corporation and hospital visited the landfill site on 5th January 2008. It was observed that neither the City Corporation nor the hospital was aware of such waste inside the chambers. The authorities were not certain of



the source of waste generation. It is very likely that the either Hospital or Medical Supply Depot (MSD) could have generated the waste.

The city corporation, as on date of audit, had no concrete plans managing such wastes. Therefore, the hospital authority in consultation with Phuentsholing City Corporation should work out a proper procedure of *Medical Wastes Chambers (landfill, disposing off these wastes)* in an environmentally friendly manner.

5.2 Lack of awareness on Waste management System

Many of the staff, especially the ward persons and cleaners, were not aware of the existence of guidelines for infection control and health care waste management and thus were not properly oriented in waste management system. None of them were provided with trainings on issues related to medical wastes and its impact on human health and the environment. The hospital management also felt the need for such programmed trainings to improve the waste management practices.

5.3 Need to develop Waste carrying route and procure proper carrying carts

As mentioned above, Phuentsholing Hospital disposes off its infectious waste in a deep burial pit constructed inside the hospital premise. Site visits revealed that the burial pit was located approximately 150 metres away from the main building. As could be seen from the picture, the route is not properly developed and is also used as foot paths by the people. Ideally, the waste carrying route should be separately constructed and should not be used as foot paths considering its ill effects on human health.



Deep burial pit and waste carrying path leading to the pit.

Besides, the cleaners carry wastes in the waste collection polythene bags, instead of waste carrying carts.

6

Recommendations

All the recommendations put forth by the Royal Audit Authority are the results of what has been observed during the course of audit. Some of the best practices around the globe which were found relevant and practical were also referred, compared and analysed during the audit and accordingly recommended. Techniques applied in audit included physical verifications, site visits, walk-through tests, review of records and interviewing stakeholders at various levels.

It is acknowledged that despite the exponential increase in volume and composition of wastes, two hospitals have strived to manage waste within the given limited resources. Human and financial resources were found to be some of the major bottlenecks in the effective management of medical wastes.

Based on the results of what has been observed, analysed and studied during the audit, the RAA recommends the following;

1. Maintain proper documentation on the management of medical wastes

Both the hospitals should strive to maintain proper documentation on management of medical wastes. Proper records at different stages of waste management cycle would assist management in prioritizing resources and managing waste in effective and efficient manner. It would also facilitate studies on medical waste management in future.

2. Appropriate medical waste management rules and regulations to be framed.

Although the Ministry of Health had framed a policy document on solid waste management, no clear rules and regulations have been framed to put the policy into practice. Therefore, the hospital authorities should frame proper rules and regulations

and assign clear roles and responsibilities for management of medical waste. Unless there are clear roles and responsibilities, accountability remains unclear. Ideally, a full time personnel having sufficient knowledge on the subject could be appointed for the task.

3. NEC and Hospital authorities to have improved and continual monitoring

The hospital authorities and the National Environment Commission should monitor waste management on continual basis. A system could also be instituted requiring the hospital authorities to submit Annual Waste Management Report to the NEC and the Ministry of health with a copy endorsed to the respective municipal authorities.

4. Provide awareness on medical waste management to the staff and workers

Though many of the middle level staffs were aware of the waste management issues, cleaners and ward boys do not seem to have clear knowledge on the issues related to medical wastes. Therefore, hospital authorities should structure appropriate courses to educate and create awareness amongst all levels of staff with particular focus on those handling the wastes.

5. Provide storage and transportation facilities at autoclaving site

In order to avoid scavenging by humans and stop access to animals, the hospitals should provide proper storage facilities at the autoclaving site. Besides, the JDWNRH should look for an alternate solution to stop temporary storing of waste under stair cases of the hospital. The temporary storage ideally should be at a place where no one can reach and should be able to contain the smell.

The current timing of transporting the waste i.e. 10 A.M. may also be reviewed. If possible, the time to transport waste could be scheduled at odd hours or else an alternate route to carry waste could be looked into. At present, the same route is used by patients and visitors, is also being used for carrying wastes.

6. Autoclave Machine to be installed in Phuentsholing General Hospital

At present, infectious medical wastes were disposed off at the deep burial pit located in the hospital premise. As stated by the management, a waste autoclave machine was already procured and was yet to be installed. It is recommended that an operator for the machine should be fully trained and oriented not only in operating the machine but also on issues related to medical wastes.

7. Small autoclave machine could be installed inside the laboratories

Laboratory is one centre where maximum wastes of infectious nature are generated. Therefore, it would be prudent to have a small autoclave machine inside the laboratories generating huge wastes so that the risks are not exposed to waste handlers and the external environment.

8. Ensure best use available resources through proper planning and prioritisation

In developing country like Bhutan, human and financial resources will continue to be major constraints for implementing any activity. Therefore, the hospital authorities should plan and priorities all the activities and accordingly propose for fund and manpower to the respective authorities. However, the effort should always be on making the best use of the available resources.

9. Propagate the concepts of 3Rs

Though it is not expected of Hospital authorities to propagate the concept **3Rs** (*Reduce, Reuse and Recycle*) of waste in extensive manner, majority of the waste generated from health care facilities could be reduced or recycled. For instance the paper wastes, cardboards and drugs and non-drugs containers could be used for other purposes. One of the principles of good waste management system is the avoidance and minimization of waste and the promotion of recycling and re-use. Therefore the hospital authorities may look into the possibilities of promoting **3Rs** with due regard to health hazards.

10. Different types of hospital wastes should be segregated

Since different types of wastes warrant different disposal facilities and equipment, it would be necessary to segregate them at the point of their origin. It would also facilitate quantification and resource allocation.

|

Appendix

Sources of Audit Criteria for Medical Waste:

1. Guidelines for infection control & health care waste management in health facilities, 2006;
2. Environment Assessment Act 2000;
3. Environmental codes of practice for Hazardous waste management 2002 and
4. Web sites of International Organization of Supreme Audit Institutions (INTOSAI) and other related organizations.

Methodology:

The aim of the audit was to review and assess the management of medical wastes at Jigme Dorji Wangchuk National Referral Hospital, (JDWNRH) Thimphu and Phuentsholing General Hospital. Due to lack of records on waste, interviews, feed backs and site visits were the main methods of seeking information. In order to gather additional information, the team had also taken participatory observation in the operation and management of waste in municipal areas. Questionnaires were also distributed to the management and stakeholders at various levels.

Scope:

There was no specific time period to review the waste management system; therefore the team reviewed the current system of managing waste in Thimphu and Phuentsholing hospitals.



*Every individual must strive to be principled.
And individuals in positions of responsibility must even strive harder*
