BIO-MEDICAL WASTE DISPOSAL PLANT

proposed by Chazhikkadan Medical Foundation at Thodupuzha

and

COMMUNITY HEALTH, ENVIRONMENTAL & HUMAN RIGHTS CONCERNS

- *A JANANEETHI REPORT* -

Introduction:

Bio-medical waste is any waste generated in the process of diagnosis, treatment or immunization of human beings or animals, research activities, production or testing of *biologicals*. It shall be the duty of the *occupier* to take all steps to ensure that such waste is handled without any adverse effects on community health and environment. It is estimated that only 6% of the waste stream is infectious that needs to be disinfected. 2% of the hospital waste stream is pathological waste and shall be burned in a crematorium or other incinerator. The rest of the wastes, more than 90%, can be handled in the same way we handle solid wastes - by reducing, re-using, and re-cycling. Waste collection efficiency in Indian cities range from 50% to 90%. Hazardous wastes pose a risk to humans, animals, vegetations and the environment. Examples include materials that might be radio-active, explosive, flammable, infectious or toxic at variable degrees and in all realms of environment. It is ironic that those institutions engaged in healing the sick and caring community health are unintentionally contributing significantly to the proliferation of some of the most toxic compounds known. One of the reasons why the hospitals have not been leaders in preventing pollution is that they are not monitored or controlled by any statutory rule or regulation with respect to the waste management. The cost-factor in introducing modern technology for the disposal of wastes and the profit motive of the hospital management often compel them to opt for the cheaper and easier 'end-of-pipe' technology solutions. Incineration is one among them. India does not have common standards for operation of incinerators except for incineration of medical wastes as per Bio-medical Wastes (management and handling) Rules 1998 and Municipal Wastes (management and handling) Rules 2000. Medical wastes shall not be incinerated because there are safer and cleaner alternatives.

Bio-medical waste:

Bio-medical waste is defined in Rule 3 (5) of the Bio-medical Waste (management and handling) Rules 1998. As per schedule 1 of this enactment the Bio-medical waste is categorized as follows: -

Categories of Bio-Medical Waste

Option	Waste Category	Treatment and Disposal
Category No. 1	Human Anatomical Waste (Human tissues, organs, body parts)	Incineration [(1)]/deep burial[2]
Category No. 2	Animal Waste (Animal tissue, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by Veterinary hospitals colleges, discharge from hospitals, animal houses)	Incineration[(1)]/deep burial[(2)]
Category No. 3	Microbiology and Biotechnology Waste (Wastes from laboratory cultures, stocks or specimens of micro-organisms live or Attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, Dishes and devices used for transfer of cultures)	Local autoclaving/micro-waving/incineration[(3]
Category No. 4	Waste Sharps (Needles, syringes, scalpels, blades, glass, etc., that may cause puncture and cuts. This includes both used and unused sharps)	Disinfections / chemical Treatment[(3)]/auto craving/ Micro-waving and Mutilation/shredding[(4)]
Category No. 5	Discarded Medicines and Cytotoxic drugs (wastes comprising of outdated, contaminated and discarded medicines)	Incineration([1)]/destruction and drugs disposal in secured landfills
Category No. 6	Solid Waste (Items contaminated with blood, and body fluids including cotton, dressing, soiled plaster casts, lines, beddings, other material contaminated with blood)	Incineration[(1)] autoclaving/ micro waving

Category No. 7	Solid Waste (Wastes generated from disposable items other than the waste sharps such as tubing, catheters, intravenous sets etc.).	Disinfections by chemical treatment[3]/ autoclaving/ micro waving and Mutilation/shredding[4]
Category No. 8	Liquid Waste (Waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities)	Disinfection by chemical Treatment[3] and discharge into drains.
Category No. 9	Incineration Ash (Ash from incineration of any biomedical waste)	Disposal in municipal landfill
Category No. 10	Chemical Waste (Chemicals used in production of biologicals, chemicals used in disinfection, as insecticides, etc.)	Chemical treatment[3] and Discharge into drains for Liquids and secured landfill for solids

1. *There will be no chemical treatment before incineration. Chlorinated plastics shall not be incinerated.*
2. *Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.*
3. *Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.*
4. *Mutilation/shredding must be such so as to prevent unauthorized reuse.*

Segregation, packing and transportation:

There are many specifications provided in the rules with respect the safety and protection while handling the Bio-medical waste materials. Rule 6 provides for Segregation, Packing, Transportation and storage of the Bio-medical waste. The Rule further insists that schedule 3 and schedule 4 is to be followed in all these procedures.

A reading of Rule 6 is as follows:

Segregation, Packaging, Transportation and Storage:

(1) Bio-medical waste shall not be mixed with other wastes.

(2) Bio-medical waste shall be segregated into containers/bags at the point of generation in accordance with Schedule II prior to its storage, transportation, treatment and disposal. The containers shall be labeled in accordance to Schedule III.

(3) If a container is transported from the premises where biomedical waste is generated to any waste treatment facility outside the premises, the container shall, apart from the label prescribed in Schedule III, also carry information prescribed in Schedule IV.

(4) Notwithstanding anything contained in the Motor Vehicles Act, 1988, or rules there under, untreated biomedical waste shall be transported only in such vehicle as may be authorized for the purpose by the competent authority as specified by the government.

(5) No untreated biomedical waste shall be kept stored beyond a period of 48 hours:

Provided that if for any reason it becomes necessary to Store the waste beyond such period, the authorized person must take permission of the prescribed authority and take measures to ensure that the waste does not adversely affect human health and the environment.

Further, the schedule II insists as follows:

Schedule II

(See rule 6)

Colour Coding and Type of Container for Disposal of Bio-Medical Wastes

Colour Coding	Type of Container	Waste Category	Treatment options as per Schedule I
Yellow	Plastic Bag	Cat.1, Cat. 2, and Cat.3,	Incineration/deep burial
Red	Disinfected container/plastic bag	Cat.3, Cat.6, Cat.7,	Autoclaving/Micro waving/Chemical Treatment
Blue/White Translucent	Plastic bag/puncture proof container	Cat.4, Cat.7.	Autoclaving/Micro waving/Chemical Treatment and destruction/shredding

Notes:

1. Colour coding of waste categories with multiple treatment options as defined in Schedule I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule I.

2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.

3. Categories 8 and 10 (liquid) do not require containers/bags.

4. Category 3 if disinfected locally need not be put in containers/bags.

Saga of Thudanganad:

Thudanganad is a village of Muttom Panchayath in Thodupuzha *taluk* of Idukki district in Kerala State, South India. This agricultural, evergreen, hamlet is surrounded by hills on all sides and is encompassed by many springs and streams maintaining the land ideal for cultivation and human habitation in all seasons of the year. The residents of the area, invariably, are farmers and small peasants who work in their land and produce food for their sustenance.

Thudanganad is 8 kms away on the south-east of Thodupuzha town, the most developed area in the hill district of Idukki, which, perhaps, is the most backward district of the state of Kerala, taking into account the socio-economic and cultural indicators of development. Idukki has large areas of barren land, and the human habitation is concentrated in certain pockets like Thudanganad where the soil is profoundly fertile, water is available in all seasons, and rich in flora and fauna.

There were complaints, received at JANANEETHI office from its friends Mrs.Kuttiamma Michael and Mr.P.F.Michael of Thudanganad regarding the proposed project for bio-medical waste disposal that includes among other things an incinerator, reportedly to be erected at Thudanganad and the consequent, impending environmental havoc that would surely hamper the normal life of the people in the village. The project is reportedly a joint venture of Indian Medical Association (IMA), Kerala Branch and a private firm named as Chazhikkadan Medical Foundation (CMF) having its regd. Office at Thodupuzha.

JANANEETHI, a registered charitable society for HUMAN RIGHTS, providing legal aid and assistance, advocacy, capacity building for empowerment of women and weaker sections, be-friending services for suicide prevention, consumer education, alternate dispute settlements etc. has been concerned with environmental issues for the last one decade of its existence. It believes that any attack on the environment or deprivation of the right to safe water, air and environment will amount to violation of the most sacred of all rights of the humans, animals and plant kingdom – the RIGHT TO LIFE. In the circumstances, Jananeethi delegated a team of its executive members to make on-the-spot study of the situation and report back with an action plan. The team consisted of: -

Dr. Francis Xavier,
Advocate Ms. Jasmine Joseph,
Advocate Bijo Francis, and
Advocate George Pulikuthiyil.

The team on 15th August 2002 visited IMA office at Thodupuzha and had detailed discussion with Dr. Sajan Joseph Chazhikkadan, the chief functionary of the Chazhikkadan Medical Foundation and Dr. Emmanuel, the president of the local unit of the Indian Medical Association. The team later met the representatives of the local

inhabitants who vehemently oppose the project. The team also visited the site for the proposed project and assessed the situations.

The Visit:

Jananeethi team was received at the IMA office by Dr.Emmanuel and Dr.Sajan Joseph Chazhikkadan. The meeting lasted for about 90 minutes. Jananeethi requested for a copy of the project that was refused, as they claimed that they did not have a copy with them. (*Later the team was told that the full text of the project proposal has not been disclosed to any body till date. An abridged version of the same was given at the request of the former minister of the state Mr. P.J. Joseph. However, it does not give any material description of the proposed project).*

What did the team learn from Dr.Emmanuel and Dr.Sajan Joseph Chazhikkadan?

A summary of the discussion and the information collected from the president of the IMA (Thodupuzha) and the Managing Trustee of the Chazhikkadan Medical Foundation (CMF) are enumerated below: -

1. This project was a **dream of late Dr. Joseph Chazhikkadan** and the CMF is vowed to realize it at any cost. (*Dr. Sajan considers it a matter of his pride and therefore he has taken it as a challenge)*
2. Initially the project was conceived, designed, verbalized and presented by Dr. Sajan Joseph of the CMF for Thodupuzha (in view of the hospitals under the CMF situated in and around Thodupuzha) and later the **idea was sold to the IMA** (or*, borrowed by IMA*) for the entire state of Kerala. However, the intellectual property rights of the scheme (if any) rests with the CMF.
3. The project, today, is a programme of the IMA and neither Dr. Emmanuel nor Dr. Sajan was capable of (*authorized to*) giving any explanation or details with respect to the project, and hence whatever they were communicating to the team, had **no official approval**, nor it had any evidential value.
4. The IMA with approval from Government intends to establish **bio-medical waste disposal plants in 12 districts** of the state of Kerala. (*The Supreme Court of India has given clear directive that every hospital should have its own system to dispose its medical waste and that has to be implemented before end of 2002. IMA considers that individual hospitals will not be able to cope with it, since it involves huge expenditure*). To start with, it has divided the whole of the state into four regions and each region will have one plant each. The one it intends to establish at Thudanganad is one among the four.
5. The IMA presented the project to the Government and it was accepted. The same was presented to the Kerala State Pollution Control Board for clearance and it was granted. The IMA requested the Government for land and the designated plot at Thudanganad was allotted by the Government of Kerala. **Application for license from the village panchayath was made long ago** and its response is awaited.

6. Hospital wastes (bio-medical wastes) from private hospitals of Thrissur, Ernakulam, Kottayam and Idukki districts will be collected **in sealed vans and in sealed containers** made of 160 micron plastic and will be reached at the plant **in 48 hours**. The waste once put into the special containers will not be retrieved in transit or at dumping. The container will be disinfected with formalin at source. Government hospitals' wastes may also be considered later. (*Wastes from 10,000 hospital beds – is the estimated workload of the plant).*

7. **Specially trained staff at the expense of the respective hospitals will do segregation and classification of the bio-medical wastes at the sources**. The IMA will monitor the entire activity.

8. .The IMA has no doubt about its strengths – its **financial capability, managerial ability and its accountability to public health.**

9. The IMA is prepared to shun its claim on Thudanganad and **will move to where-ever the Government provides land** for the project. (*It was not the mood of the CMF as expressed by Dr.Sajan who seemingly has taken it as a matter of his prestige to have the plant at Thudanganad itself)*

10. The proposed site for the plant at **Thudanganad is a barren land**, not good for any thing else. There is **no organic activity** any where in the vicinity of the plot. There is **no activity or human habitation with in 3 kilometers** of the proposed site for the plant. The sewage water or industrial waste, if at all there is any, will in no way reach to the water sources.

11. The incinerator, probably, is only a small segment of the entire plant, which will be a unique venture in the whole of the country, and it will introduce the **most modern technology** that has not been known even to the western world. In India so far no body has dared to experiment it. (*Dr. Sajan was apparently very vocal about the uniqueness and un-questionable perfection of the scheme that, according to him, surpasses everything that was invented so far).*

12. There will absolutely be **no environmental impact** due to the normal functioning of the plant. There will be **no emission** of any smoke, gas or wastewater from the plant.

13. Only used **linen and cotton** wastes will be incinerated. Other medical wastes like syringe, needles, plastic bags etc will be processed / re-cycled for manufacturing containers to collect the waste from the sources. All organic and human wastes will be buried by the respective hospitals.

14. The incinerator will be operated using **diesel** as fuel and there will be **NO sound, air, water or soil pollution** incidental thereto.

15. The objection to the project proposal by the general public of Thudanganad is orchestrated by a few interested rich families who do not want any **labour- intensive** development to come to Thudanganad since they fear that they may not get cheap labour in their estates any more.

16. The CMF chief, Dr. Sajan Joseph, challenged the team to visit his hospital *par excellence* in the town and get convinced how the **management of hospital waste was ideally done** with out any infringement on the civic rights and community health.

This paddy field, fertile and embraced by springs & streams all around, is also part of the 3 acre adjoining land intended for the installation of the waste processing plant.

What do the villagers say?

The team then proceeded to Thudanganad. They were received by the President of the Grama Panchayat, his council members, few members of the Action Council at the premises of the catholic church of Thudanganad. They took the team to the proposed project site and explained the importance of preventing the reported move by certain business groups who, unfortunately, are in the medical field and are good in the rhetoric of modern technology and further, are wielding high-handedness in politics and in bureaucratic circles as well. The team shared the views of the IMA and the CMF with the representatives of the people of Thudanganad. The people produced for verification the copies of the applications made by the CMF to the State Pollution Control Board and to the Single Window Clearance Board, Idukki for sanction of the project. A closer perusal of those documents proved beyond doubt the objective irregularities and discrepancies in the statements of the IMA and CMF officials (*though they had already bailed themselves out by saying that their depositions had no official nature, nor any authenticity)* and how badly they had distorted facts in order to de-fraud and misguide the team. The following are the responses of the people.

This stream flows less than 10 meters away from the designated plot for the proposed plant. It joins the main river 5 kms from this point, from where drinking water is pumped for people of Thodupuzha town and 4more panchayats each of which has an average population of 15,000.

1. The people and the panchayat authorities are totally ignorant of the reported project proposal and all the attempts to procure a copy of the complete text of the project report were defeated by the personal intervention of the CMF chief under the pretext of intellectual property rights.
2. The Panchayat is a statutory authority in matters concerning the respective panchayat. It should be noted that the applicant has not approached the panchayat in this matter. Further, the CMF and the IMA have been evading at all stages the panchayat authorities to circumvent legal formalities.
3. The *Grama Sabha* had met on four occasions to discuss the various ramifications of such a project in a village like Thudanganad and every time the *Grama Sabha* had unanimously passed resolutions strongly opposing the idea of a bio-medical waste treatment plant at Thudanganad.
4. The Muttom Panchayat has not been approached by either of the two organizations for license. Where as the copy of an application by the CMF chief, Dr. Sajan Joseph, to the Single Window Clearance Board, Idukki for Panchayat license was forwarded to the Panchayat by the Board with a covering letter dated 13th August 2002. The interest of the Board in the matter is so evident that the Board has cautioned in its letter to the Panchayat that action on the application will be taken unless otherwise heard from the Panchayat with in 7 days from the receipt of the notice.
5. The proposed site for the project is not barren as had been described by the CMF chief. It is a fertile agricultural land, vibrant with human habitations on all sides, having private houses and tribal hutments in large number. The fabric of water sources in and around the site leaves the land ideal for crops. A fresh water stream *Karimbani* is coursing through the area and is joining the *Parrappan* stream, which again joins *Thodupuzha River*. This is the source of drinking water for people of Thodupuzha town, and people of Muttom,

Melukavu, Kudayathur, Karimkunnam, Edavatti and Kadanad panchayats each of which has average population of 15000 people. They depend heavily on the same water sources for agricultural and other domestic purposes as well.

6. Thudanganad is a serene agricultural hamlet surrounded on three sides by hills inhabited by poor people. Even if a chimney of 15 feet/meters high is erected in the plant, as claimed by the applicant in his representation, the smoke with toxic emission will pollute the air, directly hitting the residents of the hill slope.
7. There are 2 schools, one hospital, 2 convents, one Christian church and a host of shops and business establishments in less than 100 meters from the proposed site. The vicinity is vibrant with human activities. Thodupuzha – Pala public road is with in 25 meters only from this spot.
8. It is not the vested interests of a few families who oppose the idea of an incinerator in their village working behind the public protest. The Panchayat officials, irrespective of their mutually opposing political loyalties and varying priorities, all elected members to the local body, and the entire people of the Muttom Panchayat are rallying behind the public agitation. Further, they assert that the adjoining panchayats of Melukavu, Kudayathur, Kadanad, Karimkunnam and Edavetty also support the cause of the people of Muttom panchayat.


9. The agitating public is not totally opposed to the idea of hospital waste treatment plant. They suggest other sites at various other locations with in the district that are devoid of any organic activity and away from human habitation.
10. The people allege hidden motives in the capricious steps initiated by the CMF to get the plant established at the same site considering the proximity of the place to Thodupuzha town where the applicant has several medical institutions
11. The CMF is in no way a model for healthy management of bio-medical wastes as claimed by the CMF chief. The people alleged that the effluents emitted from the applicant's hospital situated in the heart of Thodupuzha town are being flown into the river during odd hours of night. The applicant, according to the people, is a juggler who manipulates for its/his business gains.
12. The people complained that the applicant has been doing unethical practices to divide people by offering material benefits and false promises.
13. The people of the village and neighboring villages are on agitation from the very beginning of the project proposal. They said that the land was procured by the CMF under the pretext of turmeric and ginger cultivation. When they

realized that they had been betrayed, they openly came out in large number and organized themselves in rallies and *morchas* with torches up in their arms

14. The project proposal does not give any scope for creation of job opportunities. Hence it cannot be regarded as a labour intensive programme. Therefore, there is no reason in alleging fear of losing labor force in the farmhouses of the place.

Incineration and related problems:

In India the incineration technology is rudimentary. Most of them are single chambered with a smoke stack for bio-medical incinerators. The incinerators should be double chambered with smoke stack of a particular height. Secondary chamber is needed to eliminate volatile substances by better combustion (biomedical rules). The standard requirement of an incinerator is that its combustion ability should be 99 % and the temperature 800±50°C. The law pertaining to emission also requires specially designed pollution control devices. What will be the sanctity of such standard in a heavy monsoon prone area like Kerala, where large quantity of washed out wastes is likely to pollute the nearby drinking water sources? The pests encroaching such sites can cause mass destruction by spreading health hazards. It is also mandatory that the wastes should be chemically treated with any chlorinated disinfectants before incineration. Do we have any cheaper disinfectant other than the common chlorinated chemicals? All health related *occupants* use bleaching powder as a common disinfectant. How can we address this practice sympathetically or on a casual manner? Toxic metals, too, are to be incinerated. What types of fumes are emitted from such incineration? This holds good in the case of unwanted and dangerous drugs and chemicals too. After incineration the problem of deep burial of the left-over will also arise. This ash has to be dumped in impermeable burial sites. There should not be shallow wells near such areas. It is to be ensured that these pits are away from human habitation. The area should not be prone to floods, soil erosion or other natural calamities.

The World Health Organization (WHO) has presented very generic overview on alternate technologies, usually equating them at par with incinerators. For those who are concerned of public health and community care have always found it rather impossible to recommend a system that is full-proof. Medical waste incinerators emit toxic air pollutants and remain as the major sources of dioxins and mercury in the environment. They also generate ash that is potentially hazardous to health of humans, animals and plants.

Incinerators emit toxic air pollutants:

A medical waste incinerator releases into the air a wide variety of pollutants including **dioxins, furans, metals such as lead, mercury, cadmium, particulate matter, acid gases (hydrogen chloride and sulfur dioxide), carbon monoxide, nitrogen oxides etc.** These emissions have serious adverse consequences on workers' safety, public health and the environment. Dioxins, for example, have generally been associated with cancer, immune system disorders, diabetes, genetic defects, and such other threats to life. It must, however, be noted that non-incineration technologies too may

cause toxic emissions (although research indicates that these occur in smaller amounts). Major reasons for the dioxin emissions from medical waste incinerators in India are:

1. They are used for illegal performances like burning mixed wastes violating rules.
2. Due to failure of law enforcement and monitoring systems, most of the hospitals violate statutory orders restraining them burning their plastic wastes and wastes treated with chlorinated disinfectant
3. Many use single chambered incinerators in spite of the mandatory provision in law that requires double chambered ones.
4. Most of the incinerators, installed in India, are not operating under stipulated temperature. (Primary chambers varying from 800° to 850°C and secondary chambers from 1000°C and above.

Close to 2 schools, one hospital, 2 convents, church and one colony of a backward community and many other residential houses and business establishments, this ever green, pasture land for cultivation and cattle feeding is facing the threat of the proposed Biomedical Waste Disposal Plant.

THE PROBLEM:

Hospital incinerators as major sources of Dioxin and Mercury in the environment:

- The Environmental Protection Agency of a developed country in the West fingered hospital incinerators as one of the three largest known sources of dioxin in the environment. Dioxin is known to be carcinogenic. Inter-acting directly with DNA through a receptor-based mechanism, dioxin also acts as an endocrine disruptor with adverse effects on reproductive, immune systems of human body and human development. Developing organisms are particularly susceptible in all species studied, and extraordinarily small fetal exposures to dioxin frequently have permanent, life-long effects.

- The Environmental Protection Agency, USA, in one of their re-assessment study on dioxin found that dioxin not only causes cancer but also, even at smaller levels, lead to reproductive, developmental and immune system problems. Dioxin is one of the most potent toxins known to science.

- Mercury is another potent neurotoxin, which is already widespread in the environment. Mercury is also bio accumulative and toxic to kidneys and nervous system. Readily converted to its organic form in the environment, mercury interferes with normal brain development. Mercury in the medical waste stream is principally derived from thermometers, blood pressure gauges, batteries, and fluorescent lamps.

Incinerator ash is potentially hazardous:

The ash remains after incineration **contains heavy metals** that may leach out. Dioxins and furans may also be found in the bottom ash (TEQ level range from 106 ng/kg to 466ng/kgwith a mean value of 258ng/kg in municipal waste incinerator in India and fly ash has higher contamination levels 13000ngTEQ/kg5). In states where low-level radioactive waste is incinerated, the ash residue may also contain traces of radioactive isotopes. Fly ash (ash that is carried by the air and exhaust gases up the incinerator stack) contains heavy metals, dioxins, furans, and other toxic chemicals that condense on the surface of the ash. Even when the fly ash is removed from the exhaust stream by pollution control devices such as bag house filters, the toxic materials remain concentrated on the filter cake and should be treated as hazardous waste. Even state-of-the-art incinerators, which produce cleaner air, in turn generate ash that is more toxic, with higher concentrations of dioxin and mercury. The ash must still be disposed of, typically in landfills.

Alternatives disinfect medical waste without producing Dioxin:

A recent study in the United States reveals that medical waste incinerators are quite unnecessary. Medical waste should not be incinerated due to the availability of viable alternatives that are safer, cleaner, do not produce dioxin and are just as effective at disinfection, according to a report by Health Care Without Harm, an international coalition of doctors, hospitals and public health advocates with 335 members in 36 countries. The report proves that the incineration of medical waste is not necessary from a technical standpoint. By choosing a cleaner non-incineration technology, hospitals can demonstrate their commitment to protecting public health and our environment," said the report's primary author, Dr. Jorge Emmanuel, a chemical engineer, chemist and environmental consultant who has been studying medical waste treatment technologies for more than a decade. "Incineration does not make medical waste disappear. The gas byproducts and resulting toxic ash endanger our health and the health of future generations," Dr. Emmanuel said.

Why does the public oppose incineration?

A plume of smoke from the stack of a hospital incinerator is a constant reminder of the environmental havoc and irreparable damage caused to the peace and tranquility of the local inhabitants by the presence of the incinerator. Therefore, INFORMED

CONSENT of the people who are affected thereby should be of paramount importance before permission is accorded to the installation of an incinerator, more especially if it is to be erected in a residential area. RIGHT TO LIFE is the most pivotal of and fundamental to all human rights. Right to CLEAN air, water, and environment is most essential and intrinsic to the right to life. No one should be deprived of this right, any violation of which is prevented by a constitutional mandate upon the State.

There are many proven technologies for the disposal of wastes. Based on the process involved and divergent applications they are categorized as given below.

1. Thermal processes
2. Chemical processes
3. Irradiative processes
4. Biological processes

NON-INCINERATION TECHNOLOGIES	TECHNOLOGY VENDORS
MEDIUM-HEAT THERMAL PROCESSES	
Reverse Polymerization Environmental Waste International	(Ajax, Ontario)
Thermal Depolymerization Changing World Technologies	(West Hempstead, NY)
HIGH-HEAT THERMAL PROCESSES	
Pyrolysis-Oxidation Oxidation Technologies	(Annapolis, MD)
Plasma Pyrolysis DayStar/Prometron	(Tokyo, Japan)
Plasma Pyrolysis Electro-Pyrolysis, Inc.	(Wayne, PA)
Plasma Pyrolysis HI Disposal Systems	(Indianapolis, IN)
Plasma Pyrolysis Integrated Environmental Systems	(Richland, WA)
Plasma Pyrolysis MSE Technology Applications	(Butte, MT)
Plasma Pyrolysis Plasma Pyrolysis Systems	(Stuyvesant Falls, NY)
Plasma Pyrolysis Startech Environmental Corp.	(Wilton, CT)
Plasma Pyrolysis Unitel Technologies	(Mt. Prospect, IL)
Plasma Pyrolysis Vance IDS/Bio Arc	(Largo, FL)
Plasma Pyrolysis Vanguard Research Inc.	(Lorton, VA)
Induction-Based Pyrolysis Vanish Technologies/LFR	(Raritan, NJ)
Laser-Based Pyrolysis Anara Group	(Las Vegas, NV)
Superheated Steam Reforming Duratek	(Columbia, MD)
Advanced Thermal Oxidation NCE Corporation	(Carrollton, TX)
CHEMICAL PROCESSES	
Sodium Hypochlorite-Hammermill Circle Medical Products	(Indianapolis, IN)
Sodium Hypochlorite-Shredding (mobile)	
MedWaste Technologies Corp.	(Houston, TX)
Chlorine Dioxide-Shredding/Grinding Encore/Medical Compliance	(El Paso, TX)
Ozonation Lynntech	(College Station, TX)
Electrocatalytic Wet Oxidation MeDETOX/Delphi Research	(Albuquerque, NM)
"Stericid"-Shredding-Mixing MCM Environmental Technologies	(Gilboa, Israel)
Dry Inorganic Chemical-Shredding Positive	
Impact Waste Solutions	(Pearland, TX)
Dry Inorganic Chemical-Shredding Premier Medical Technology	(Houston, TX)
Peracetic Acid-Grinding Ecocycle 10/STERIS Corp.	(Mentor, OH)
Alkaline Hydrolysis WR_2	(Indianapolis, IN)
IRRADIATION PROCESSES	
Electron Beam BioSterile Technology	(Fort Wayne, IN)
Electron Beam-Shredding U. Miami E-Beam	(Coral Gables, FL)
BIOLOGICAL PROCESSES	
Enzyme-Based Treatment/Extrusion	
Bio Conversion Technologies, Inc.	(Norcross, GA)

What should the hospitals do?

HEALTH IS ALSO FREEDOM FROM ILLNESS. Hence those institutions and corporate initiatives / bodies like IMA / VHAI that are obliged to prevent illness and to promote community health are called upon to perform their moral and social accountability by restraining themselves to -

- *Stop purchasing products containing toxins like mercury and PVC plastic and the unwanted cyto-toxic drugs. Alternatives exist for most uses, and will lead to a considerably cleaner waste stream,*
- *Reduce, recycle, reuse and separate on site to reduce the estimated 85% of the medical waste stream which is not infectious, but rather is just like the solid waste stream,*
- *Consider alternatives to incineration. Incineration does not guarantee medical waste disappear. The gas by-products and resulting toxic ash endanger our health and health of future generations,*
- *Gauge the very idea of waste disposal by putting up an incinerator for medical waste taking into account the impending and indispensable disasters on the society in the near future, and*
- *Consider the public health factor and ethical foundations of a seemingly attractive social intervention like installation of a medical waste incinerator with hidden profit motives.*

Observations by Jananeethi:

1. To utter dismay of the team, who had been impressed by the IMA and CMF officials that the land identified for the plant was away from human habitation and devoid of any organic activity anywhere in 3 km, were convinced that they had been bluffed and ridiculed by two medical professionals who were deemed to be responsible to themselves and to the societies they represent. There is a fresh water stream in less than 10 meters from the designated site (Picture 2). It is a source for drinking water, irrigation, other domestic purposes and further, for the use of school children and the in-patients of the hospital situated within meters from the site.

2. The team felt serious reservations with respect to transparency at every stage of the steps taken for the installation of the proposed plant. The real applicant of the project being the CMF, represented by Dr.Sajan Joseph Chazhikkadan, the team was told that the project was only part of a large programme of the IMA for the entire state of Kerala. However, on close perusal of documents, the name of IMA was found nowhere in the records but for a passing reference in the abridged project report that the project would be implemented with the participation of IMA.

3. A closer perusal of the application submitted to the Single Window Clearance Board which was subsequently made available to the Jananeethi team would unambiguously point out the following interesting factors.

(a) The applicant with the Single Window Clearance Board is one Medical Reprocessing and Research Centre. It is categorically stated that it is an eco-friendly project of Dr. Chazhikkaden Foundation of Reg. no. 60/2001.

(b) The application was made only on 05-08-02, contrary to the statement made by Dr. Sajan & Dr. Emmanuel.

(c) The applicant in all other forms annexed thereto was one Mr. Sajan Joseph Chazhikkaden, the Managing Trustee of Dr. Chazhikkaden Foundation which is a charitable society registered under the provisions of the Travancore Cochin Literary Scientific & Charitable Societies Registration Act.

(d) The area allotted for the project is only 2.5acre.

(e) The southern and western boundary of the site is owned by private persons who are apparently residing there with their kith and kin.

(f) It is admitted in the application that a water stream, residential house and a school is situated within meters away from the proposed site.

(g) The chief executive of the proposed project is Dr. Sajan Joseph Chazhikkadan for Dr. Joseph Chazhikkadan Foundation or for Medical Reprocessing and Research Centre in contravention to the earlier statements of the IMA and the CMF officials.

(h) 70 KW electric power is expected to be consumed for the working of the machinery for which the power source is mentioned as by way of new connection from the KSEB.

(i) The machineries to be installed as per the applicant are - (1) Autoclave 1no., (2) Boiler 1no., (3) Shredder 1no., (4) Smelter unit 1no., (5) Powdering Shredder 1no., (6) Incinerator 1no., (8) Scrubber 1 no., Effluent Treatment Plant 1no. and a generator. Adequate provision for prevention of pollution by the afore mentioned machines has not been provided.

(j) The applicant has admitted that they will be utilizing 105000 polypropylene bags, 7500 polypropylene cartons and 600 polypropylene containers initially.

(k) There is no proposal for waste (if any generated) disposal. In this case it is admitted fact that any incinerator would generate waste which is termed as incinerator ash. The water used in the plant would also be contaminated.

(l) No area has been demarcated for waste management. By the term waste it means the waste generated during the repossessing of biomedical waste.

(m) The fuel intended to be utilized for burning in the incinerator as well as in the boiler is 280 lts and 70 lts respectively. However, the application is silent with regard to the analytical report about the type of diesel to be used.

(n) The unit is expected to produce 150 kg of polypropylene, 450 kg of glass powder and 7.5 kg of steel.

(o) The total man power requirement is only less than 25.

(p) They intend to further develop the unit but the scale and proportion is unspecified.

(q) There is no proposal for solid waste disposal but for the admission that per day the unit would produce 180 kg of incinerator ash which is intended to be utilized for municipal land filling or to be mixed with fertilizer. Here it is pertinent to note that the fertilizer value of incinerator ash is not specified.

(r) The unit intends to utilize 5000lts of water per day.

(s) It is admitted that the unit would emit Sulphur dioxide, Oxide of Nitrogen & Hydrochloric acid whereas the chimney height is only 30 mts for the incinerator and 15 mts for the boiler. On three sides of the intended site, are hills thickly populated by humans, animals and birds.

(t) The sound emission level is ought to be maintained well within 55 db during day time (6am – 6pm) and 45 db during night time (6pm – 6am) as per the pollution control board guidelines. The project does not envisage any scheme to contain sound pollution.

4. The full text of the project report has been intently kept away from all concerned. The Grama Panchayat authorities being the statutory authority of the respective panchayat has been bypassed all through and, inspite of repeated demands, the details of the project were not been disclosed to the concerned authorities.

5. It is understood from relevant records that a clearance certificate, of course with 21 conditions appended there to, has been granted to the applicant organization by the State Pollution Control Board to proceed with the construction activities of the Medical Processing and Research Centre at Thudanganad in Muttom panchayat even with out a preliminary investigation regarding the possible environmental havoc and hardships to the people living around. This amounts to a serious misappropriation of powers vested in the PCB and its decision is arbitrary, unfounded and without any bonafides.

6. It is born out from the application and from the project report that water would be utilized in abundant quantities in the proposed unit. But the source of this abundant quantity of water is not mentioned either in the project report or in the application.. The industrial water which should not be mixed with other water sources has to be contained within the premises. This would be impossible given the train of the land and the lack of any specific method in the proposed project.

7. The unit has to obtain the approval under the Kerala Water (Prevention of Pollution) Rules 1976 and this is yet to be obtained or overlooked.

8. The Hazardous Wastes (Management & Handling) Rules 1989 categorically classifies hazardous wastes. Category 12 of the schedule of the above rule would say Sludge arising from treatment of waste waters containing heavy metals, toxic organics, oils, emulsions and spent chemicals and incineration ash irrespective of the quantity generated per year is a hazardous waste. No license is obtained from the appropriate authority in this regard.

9. The application would admit that the unit emits Sulphur dioxide, Oxide of Nitrogen & Hydrochloric acid. This means the unit has also to get appropriate license from the authority under the Air (Prevention & Control of Pollution) Act and Rules, that has been overlooked.

10. The unit also utilizes Hydrochloric Acid as one of the constituents for reprocessing of the waste. If that be so the project ought to get license from appropriate authorities under the provisions of The Manufacture, Storage And Import Of Hazardous Chemicals Rules, 1989. According to the provisions of this rule the term 'Hazardous Chemicals' is defined in Rule 2 (e) as follows: "Hazardous chemical" means, -

    (i) Any chemical, which satisfies any of the criteria, laid down in Part I of Schedule I and is listed in column 2 of Part II of this Schedule;

    (ii) Any chemical listed in column 2 of Schedule 2;

    (iii) Any chemical listed in column 2 of Schedule 3; Hydrochloric Acid is listed as item no. 313 in Schedule 1 of this rule.

    More over in Rule 2 (h) the term 'Industrial Activity' is defined as follows:

    "Industrial activity" means,-

    (i) an operation or process carried out mail industrial installation referred to in Schedule 4 involving or likely to involve one or more hazardous chemicals and includes on-site storage or on-site transport which is associated with that operation or process, as the case may be; or

    (ii) Isolated storage; or

    (iii) Pipeline;

Here admittedly the project envisages an industrial activity where HCL is one of the constituent chemicals used for the purpose of processing the Biomedical Waste. In Schedule 4 of this Rule it refers to

Installations for the total or partial disposal of solid or liquid substances by Incineration or chemical decomposition.

These foregoing provisions of law mandate the license to be obtained from the appropriate authority for processing the Bio-medical waste which has been over looked by the Pollution control board.

11. As per the provisions of the Panchayat Raj Act, the applicant should have applied to the Grama Panchayat for necessary clearance certificates. It / he could appeal to the higher bodies on refusal of its/his original application with specific reasons. As a responsible body, the Single Window Board should have made detailed enquiries regarding the *bonafides* of the application and the neglect of the statutory regulations implied therein.

12. According to records, 56.46% of the total wastes belong to the category of general solid waste. As a rule the Municipalities / Corporations have their own systems or arrangements to dispose such wastes. The rest of the waste is comprised of medical waste and patients' waste (including human, animal wastes, organic and anatomical wastes etc). In fact the proposed / suggested waste *processing and recycling plant* should have had programmes for disposal of such wastes. Unfortunately the CMF project proposal does not speak about that. On the other hand, they told the team that disposal of such wastes should be at the risk of the respective hospitals!

13. Further, the project report is conspicuously silent on the disposal of rubber items that can not be re-processed. The only byproduct of rubber would be carbon and apparently there is no mention about that. The same anxiety may be raised against metal wastes for which there is no solution suggested. As per the project report for the proposed project the wastes sought to be processed are only those which are defined in categories 3,4,5,6,7&9 of schedule I of the Bio-Medical Waste (Management and Handling) Rules, 1998. The project report for the purpose of convenience divides category 4 into two via. 4(a) & 4(b). The manner and yardstick for this division is best known to them only.

14. Said about the wastes proposed to be processed, on an examination of the proposed repossessing method, it is made out that category 4(a) which contains a complex mix of plastic and sharps are finally recycled. Given the fact that 40% of the plastic used for medical purposes are chlorinated plastic how does the plant separate chlorinated plastic from other plastic is still a mystery. So is the case with the strange mixing of categories 7 & 3. While category 3 contains wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures category 7 contains wastes generated from

disposable items other than the waste sharps such as tubing, catheters, intravenous sets etc. There is no mention about the possible adverse effects.

15. The team also noticed that the PCB had committed serious errors by over-looking the issue of chemical wastes. One does not get an answer with respect to cyto-toxic drugs and radio-active chemicals. In short, any endeavor in this respect should address the following categories of wastes

    Contaminated industrial wastes,
    Toxic fumes,
    Burnt toxic ashes,
    Heavy metals, and
    Diesel wastes.

16. The applicant herein is not the IMA, but is CMF represented by its chief Dr. Sajan Joseph Chazhikkadan. It is stated in the application to Single Window Clearance, "*Medical Reprocessing and Research Centre is an ecofriendly project of Chazhikkadan Foundation, being set up for reprocessing of Bio-medical waste where by the unit can generate reprocessed plastic, glass powder, steel, ash etc. The project is being implemented in association with and active participation of Indian Medical Association, Kerala Branch*". From all the available documents it is very evident that the whole project proposal is a calculated, entrepreneurial move of a private firm, *the Chazhikaden Medical Foundation*, with business (profit) motives. It is also clear that through the IMA net-work the CMF will be able to deliver the goods all over the state of Kerala enabling itself to collect huge sum from every private hospital, present and future.

17. The applicant has admitted in his application to the Single Window Clearance Board that there would be emission into the atmosphere the following toxic gas:
    1. Sulphur Dioxide,

    2. Oxide of Nitrogen.
    There would also be *incinerator ash* which will be used a landfill or as fertilizer. All the same he had categorically denied even a remote chance of environmental pollution. The applicant has from the beginning been conspicuously hiding material facts from the villagers and who-ever concerned.

18. Given the above observations and conclusions Jananeethi is convinced beyond doubt that the applicant organization has no respect for law and human rights as enunciated in the Constitution of the country. Money, political power, manipulative skills or institutional audacity should not be allowed to do away with social accountability, respect for rule of law and strict compliance of statutory guide lines of respective authorities / bodies.

The mind of the Apex Court in India.

The Supreme Court of India, on several occasions, has made it clear that environmental rights are human rights. In a developing society like ours, a balance

has to be maintained with ecology and environment on the one hand and industrial growth on the other, paramount being the service of the society and protection of the lives of the citizens. Only for the purpose of profit making, the private parties cannot be permitted to adopt means and resort to methods, which are irritable, irrational and uncontrolled resulting in health hazard to the citizens. The Supreme Court in *Rural Litigation and Entitlement Kendra vs State of Uttar Pradesh* (AIR 1987 SC 359) took note of consciousness for environment protection, which is of recent origin. It also referred to the United Nations Conference on World Environment held in Stockholm in June 1972 and follow up action thereafter.

In *M.C.Metha vs Union of India and Others* (1991, 2 SCC 353) the court observed, " Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations .."

In *Virender Gaur vs State of Haryana*, the Supreme Court held that environmental, ecological, air and water pollution etc. should be regarded as amounting to violation of right to life assured by Art.21 of the Constitution. Hygienic environment is an integral facet of the right of healthy life and it would not be possible to live with human dignity without a humane and healthy environment. Environmental protection therefore has now become a matter of grave concern for human existence. Promotion of environmental protection implies maintenance of eco and friendly environment as a whole comprising of man-made and the natural environment. It is therefore the duty of every citizen and industry to conserve, protect and preserve the purity and sanctity of the environment.

The Royal Commission on Environmental Pollution in U.K. in its third report gave the following definition to the term "Pollution" –

> "*The introduction by man into the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structure or amenity or interference with legitimate uses of the environment".*

According to section 1 (3) of the U.K. Environment Protection Act 1990, the term "Pollution" means as follows:-

> "*The release (into any environmental medium) from any process of substances which are capable of causing harm to man or any other living organisms supported by the environment. Pollution occurs when there is the potential for harm. Harm of man is not confined to physical injury but encompasses offence caused to any of his senses or harm to his property, therefore smells and noise which may not cause injury can constitute pollution*."

"**Environmental Pollution means", says McLaughtin, "the introduction (by man into any part of the environment) of wastes, water energy or energy or surplus energy which so changes the environment directly or indirectly adversely to effect the opportunity of men to use or enjoy it."**

Conclusion:

There can not be excellence in the matter of community health without excellence in medical practitioners and civil administrators with respect to health as a fundamental right of every human being. Herbert Spencer once wrote, "No one can be perfectly free till all are free; no one can be perfectly moral till all are moral; no one can be perfectly happy till all are happy." So also, no one will enjoy perfect health till all are ensured of healthy environment. Health as a human right has a wider community orientation. The human rights continuum, as conceived in the constitution of the land and in several international covenants, is perennially progressive and life rises to higher forms and fuller manifestations. This philosophic foundation for all innovative initiatives under any modern technology should be held most sacred and pivotal to all ethical principles.

Therefore any waste, industrial or municipal, organic or bio-medical, is the necessary by-product of material affluence and social development. Hence it is only just and fair that the burden of burying such wastes should be at the risk of those who enjoy the material benefits of highly polluting developments, and not those who are denied of such benefits, but are exposed to more poverty, lack of human dignity and comforts, malnutrition, disease, etc. Jananeethi, therefore, has **no reason to believe** that the IMA and the CMF are exempted from the rule and are privileged to violate human rights and constitutional imperatives.

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