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An
AICTE
Activity
Points
Report On

“DEVELOPING AND MANAGING EFFICIENT GARBAGE DISPOSAL SYSTEM”

Submitted in partial fulfillment required for award of the Graduation Degree

Bachelor of Engineering
In
COMPUTER SCIENCE AND ENGINEERING

Submitted by
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Under the guidance of
Prof. Xyz
Designation
Department of **Computer Science and Engineering**



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Certificate

Certified that the AICTE Activity Points entitled **“DEVELOPING AND MANAGING EFFICIENT GARBAGE DISPOSAL SYSTEM”**, carried out by **KAVYA R NAIK (1HK21CS063)** is a bonafide student of **HKBK COLLEGE of ENGINEERING**, in partial fulfillment for the award of **Bachelor of Engineering in Computer Science And Engineering** of the **Visvesvaraya Technological University, Belagavi**, during the year **2022 — 2023**. It is certified that all corrections/suggestions indicated for AICTE Activity Points have been incorporated in the report deposited in the departmental library.

Signature of Guide
Mrs.

Signature of HOD
Dr.

NSS Coordinator
Jdhjshd

Signature of Principal
Dr. Tabassum Ara

DECLARATION

I hereby declare that the entire work embodied in this AICTE Activity “Developing and Managing efficient Garbage Disposal System” has been carried out by us during the Third semester of Bachelor of Engineering in Computer Science And Engineering at HKBK College of Engineering, Bengaluru affiliated to Visvesvaraya Technological University, Belagavi, under the guidance ofguide, Associate Professor, HKBK College of Engineering, Bengaluru. The work embodied in this activity is original and it has not been submitted in part time or full-time completion for any other degree in any other university.

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I would like to profoundly thank the **Management** of **HKBK College of Engineering** for providing me with such a healthy environment for the successful completion of this AICTE Activity.

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Also, I would like to express my deepest sense of gratitude to my Guide **Prof.** , Associate Professor, and AICTE Activity Coordinator **Prof Vedival R** for their constant support and guidance throughout the work.

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ABSTRACT

Nowadays waste has become a vital part of our economy, as a by-product of economic activity. It originates from businesses, the government and households and following appropriate management techniques, it can be used as an input to economic activity for instance through material or energy recovery. Waste is produced by all activities and although it is a locally arising problem it has both local and global effects. Societies need to dispose their waste products creating a source of environmental pollution. Sustainable waste management requires the combination of skills and knowledge of physical sciences and engineering together with economics, ecology, human behaviour, entrepreneurship and good governance.

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CHAPTER — 1

INTRODUCTION

1.1. WASTE GENERATION

Waste (or wastes) are unwanted or unusable materials. Waste is any substance discarded after primary use, or is worthless, defective and of no use. A by-product, by contrast is a joint product of relatively minor economic value. A waste product may become a by-product, joint product or resource through an invention that raises a waste product's value above zero.

Examples include municipal solidwaste (household trash/refuse), hazardous waste, wastewater (such as sewage, which contains bodily wastes (feces and urine) and surface runoff), radioactive waste, and others.

What constitutes waste depends on the eye of the beholder; one person's waste can be a resource for another person. Though waste is a physical object, its generation is a physical and psychological process.



Figure 1.1. Waste generation

1.2. CLASSIFICATION OF WASTES



Figure 1.2. Classification of waste

Municipal Solid wastes –Solid wastes that include household garbage, rubbish, construction & demolition debris, sanitation residues, packaging materials, trade refuges etc. are managed by any municipality.

Bio-medical wastes –Solid or liquid wastes including containers, intermediate or end products generated during diagnosis, treatment & research activities of medical sciences.

Industrial wastes –Liquid and solid wastes that are generated by manufacturing & processing units of various industries like chemical, petroleum, coal, metal gas, sanitary & paper etc.

Agricultural wastes –Wastes generated from farming activities. These substances are mostly biodegradable.

Fishery wastes –Wastes generated due to fishery activities. These are extensively found in coastal & estuarine areas.

Radioactive wastes –Waste containing radioactive materials. Usually these are byproducts of nuclear processes.

E-wastes –Electronic wastes generated from any modern establishments. Some electronic scrap components, such as CRTs, may contain contaminants such as Pb, Cd, Be or brominated flame retardants.

1.3. TYPES OF WASTE



Figure 1.3. Flowchart on classification of waste

Besides the classification based on their sources of origin, such as Solid waste, Liquid waste, and Gaseous waste also waste can be classified as biodegradable and non-biodegradable. In general, the waste might be ordered into the accompanying classes:

Solid Waste – These are the undesirable substances that are disposed of by human culture. This includes metropolitan, rural, biomedical, and radioactive waste.

Liquid Waste – Wastes created from washing, flushing, or fabricating cycles of ventures are called fluid wastes.

Gaseous Waste – These are the wastes delivered as gases from cars, plants, or consuming non-renewable energy sources like oil. They get blended in different gaseous climates and causes occasions like brown haze and corrosive downpour.

Biodegradable Waste

Waste that consists of organic matter is referred to as biodegradable waste. Food and paper are perfect examples. Organic matter is broken down or decomposed into gases (methane, carbon dioxide) and liquids (water, others) via micro-organisms of micro-organisms.

Major sources of biodegradable waste are households and some types of commercial establishments such as restaurants, hotels, food processing units etc. Some biodegradables can also come from industries, animal farms, and agricultural farms.

Non-Biodegradable Waste

Non-biodegradable waste cannot be further decomposed via the action of the micro-organisms. Such waste is the major source of toxins in the landfills. Chemicals, metals, plastics, paints, rubber, etc. are examples of non-biodegradable wastes.

These materials can remain in landfills for thousands of years without any damage. Toxins from metals and plastics get soaked into the earth and pollute the soil and water sources.



Figure1.4. Types of waste

1.4. SOURCE AND EFFECTS OF WASTE

Source of waste

- ❖ Residential
- ❖ Commercial
- ❖ Institutional
- ❖ Industrial
- ❖ Municipal Solid Waste (Construction and Demolition)
- ❖ Treatment Facilities
- ❖ Agricultural

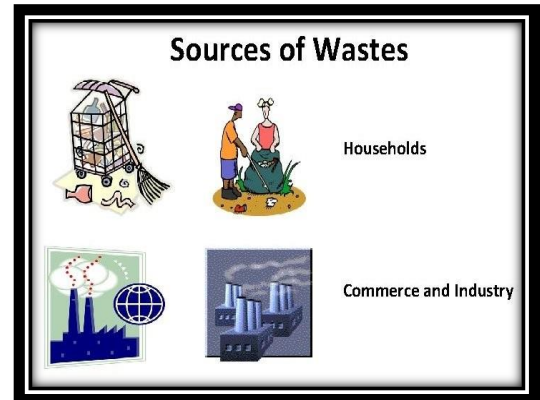


Figure 1.5. Sources of waste

Magnitude of problem:

Indian scenario –

- ❖ Per capita waste generation increasing by 1.3% per annum.
- ❖ With urban population increasing between 3 – 3.5% per annum.
- ❖ Yearly increase in waste generation is around 5% annually.
- ❖ India produces more than 42.0 million tons of municipal solid waste annually.
- ❖ Per capita generation of waste varies from 200 gm to 600 gm per capita / day.
- ❖ Average generation rate at 0.4 kg per capita per day in 0.1 million plus towns.

Effects from waste

The effects associated with waste vary widely and are influenced by the substances or chemicals found in waste and how they are managed. Although data do not exist to directly link trends in waste with effects on human health and the environment, the management of waste may result in waste and chemicals in waste entering the environment.

Generation and management of hazardous wastes can contaminate land, air, and water and negatively affect human health and environmental conditions.

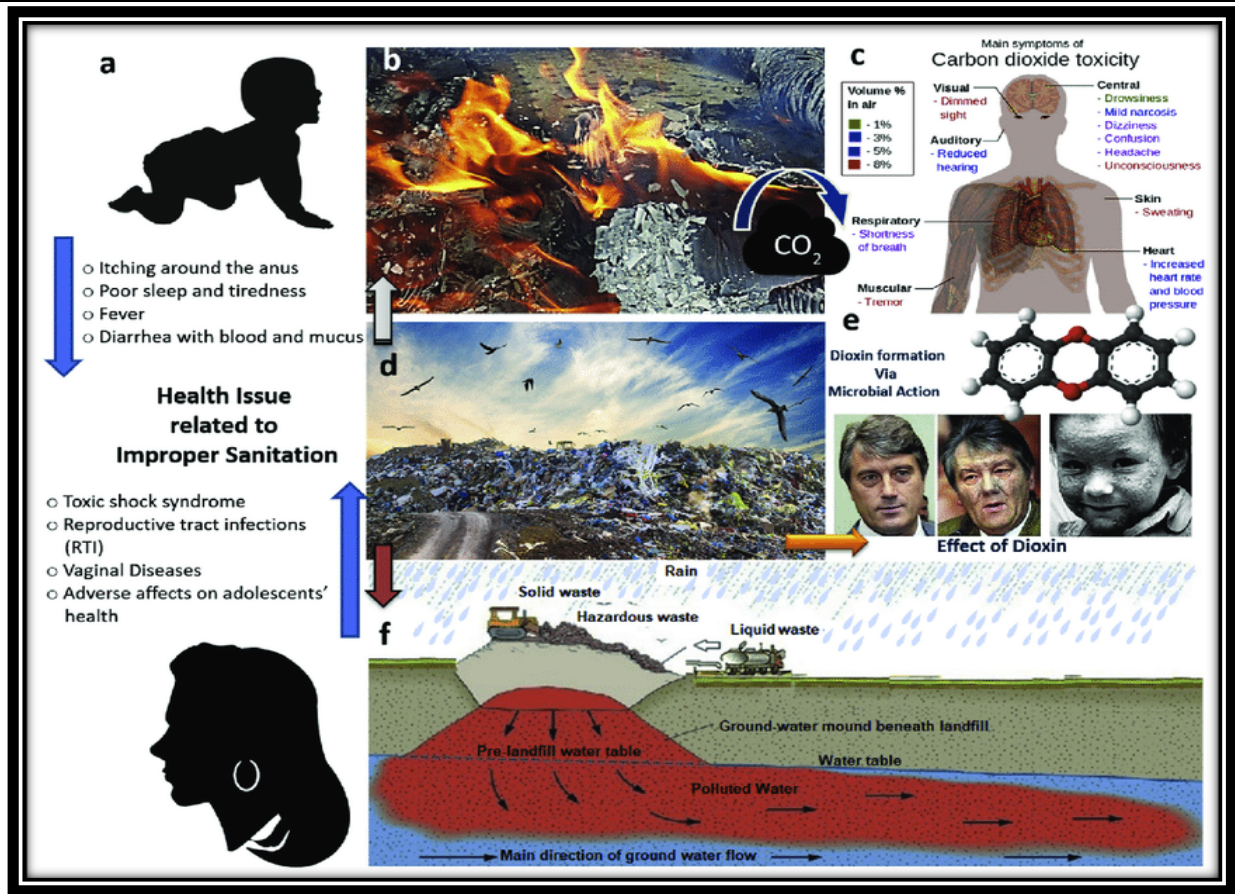


Figure 1.6. Cause and consequences of waste if not managed

Cause and consequences of improper waste management on societal hygiene:

- Poor sanitation results in multiple health issues both in child and women that could lead to chronic disease,
- The burning of solid waste produces harmful volatile organic compounds like NO_2 , SO_2 , CO_2 , CH_4 , etc., and among them potentially CO_2 is most harmful at higher concentration,
- The main symptoms of CO_2 toxicity has been indicated that could lead up to visual impairment,
- The solid dump due to the presence of birds gets scattered promoting potential threat to societal hygiene,
- The antimicrobial action on solid waste produces a class of volatile organic compounds called dioxin, that is extremely harmful,
- The dumped waste under rainy seasons excrete out poisonous water-soluble chemicals that in consequence flow down up to ground level water contamination the basic need of life.

CHAPTER — 2

WASTE MANAGEMENT

Management of Waste

Once generated, wastes must be managed through reuse, recycling, storage, treatment, energy recovery, and/or disposal or other releases to the environment. Most municipal solid wastes and hazardous wastes are managed in land disposal units.

For hazardous and industrial wastes, land disposal includes landfills, surface impoundments, land treatment, land farming, and underground injection. Modern landfill facilities are engineered with containment systems and monitoring programs.

Waste management practices prior to Resource Conservation and Recovery Act (RCRA) regulations left legacies of contaminated lands (see Contaminated Land).



Figure 2.1. Managing the waste by separation

Current approaches to waste management evolved primarily due to health concerns and the need to control odors. In the past, waste often was deposited on land just outside developed areas. Land disposal created problems such as ground water contamination, methane gas formation and migration, and disease vector hazards.

2.2. Waste hierarchy

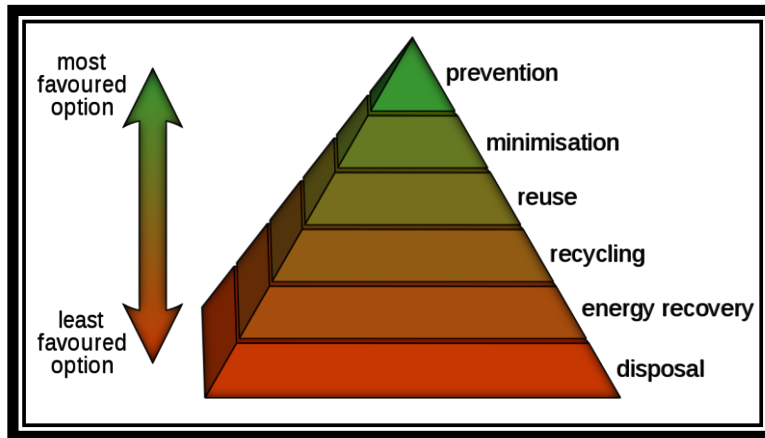


Figure 2.2. Waste Hierarchy

Waste hierarchy refers to 3 R's Reduce, Reuse, Recycle

Waste Minimizing solid waste Minimizing packaging Recyclable Paper, plastics, metals, glass, wood
Reusable? Textiles, leather, rubber, metals, wood Compostable Yard trimmings, food scraps (vegetable)

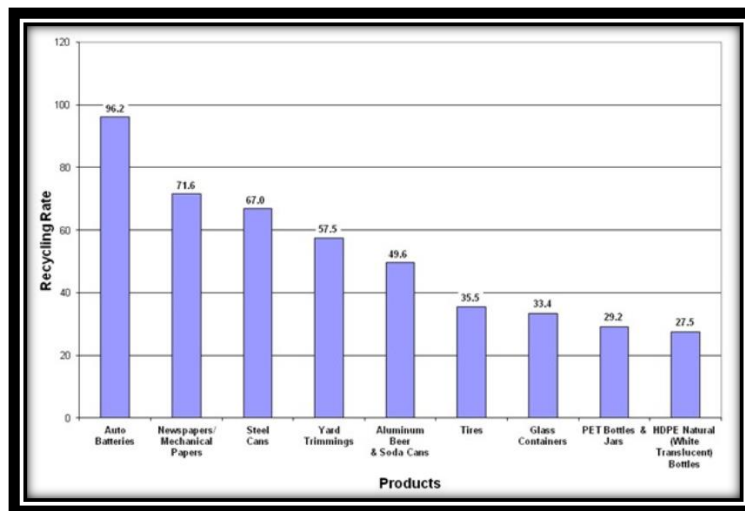


Figure 2.3. Recycling waste of selected products *2010

“By recycling almost 8 million tons of metals (which includes aluminum, steel, and mixed metals), we eliminated greenhouse gas (GHG) emissions totaling more than 26 million metric tons of carbon dioxide equivalent. This is equivalent to removing more than 5 million cars from the road for one year.

2.3. What should be done

Reduce Waste

- Reduce office paper waste.
- Improve product design to use less materials.
- Redesign packaging to eliminate excess material while maintaining strength.
- Work with customers to design and implement a packaging return program.
- Switch to reusable transport containers.
- Purchase products in bulk.

Reuse

- Reuse corrugated moving boxes internally.
- Reuse office furniture and supplies, such as interoffice envelopes, file folders, and paper.
- Use durable towels, tablecloths, napkins, dishes, cups, and glasses.
- Use incoming packaging materials for outgoing shipments.
- Encourage employees to reuse office materials rather than purchase new ones.

Donate/Exchange

- old clothes, books
- old computers
- old books
- excess building materials
- old equipment to local organizations

2.3.1. Impacts of waste if not managed wisely

- ❖ Affects our health
- ❖ Affects our socio-economic conditions
- ❖ Affects our coastal and marine environment
- ❖ Affects our climate Green Houses gasses are accumulating in Earth's atmosphere.
- ❖ Rising global temperatures leading to changes in precipitation and other local climate conditions.
- ❖ Changing regional climates could alter forests, crop yields, and water supplies.
- ❖ This could also affect human health, animals, and many types of ecosystems.
- ❖ Deserts might expand into existing rangelands, and features of some of our national parks might be permanently altered.



Figure 2.4. Impact of waste dispersion

Residents may be organized into small groups to carry out the following:

- ❖ construction of backyard compost pit construction of storage bins where recyclable and reusable materials are stored by each household,
- ❖ construction of storage centers where recyclable and reusable materials collected by the street sweepers are stored prior to selling to junk dealers maintenance of cleanliness in yards and streets greening of their respective areas encouraging others to join.

CHAPTER — 3

PROJECT IMPLEMENTATION

3.1. Aim of Activity

Disposal of garbage is a severe issue in rural areas. In rural areas, solid waste includes wastes from kitchens, gardens, cattle sheds, agriculture, and materials such as metal, paper, plastic, cloth, and so on. They are organic and inorganic materials with no remaining economic value to the owner produced by homes, commercial, and industrial establishments.

Most household waste in rural areas is organic, with little inorganic material, and is non-toxic. Though solid waste generated in rural areas is predominantly organic and biodegradable, it is becoming a significant problem as the waste produced is not segregated at the source itself.

This activity has been planned to achieve the following objectives

1. Community Education .
2. Creating awareness among village people.
3. Visiting schools and perform the activity with students and tell them regarding waste management and its benefits.
4. Visiting houses in the village and creating awareness.

3.2. Location details

The village Kyasamballi is located in K G F Taluk of Kolar District in the State of Karnataka in India. It is governed by Kyasamballi Gram Panchayat. It comes under Bangarapet Community Development Block.

Kyasamballi - Village Overview	
Gram Panchayat :	Kysamballi
Block / Taluka :	Bangarapet
District :	Kolar
State :	Karnataka



Figure 3.2.1. Map



Figure 3.2.2. Location details

3.2.1 Activities performed

One of the most important aspects, when organizing a community clean-up, is organizing for removal of trash.

Waste should be removed as soon as possible after the event to prevent the creation of unhygienic conditions and to avoid it becoming an eyesore and an environmental externality.

It is the responsibility of the project coordinator to decide with the local authority for the collection of garbage collected.

Where the local authority is not able to provide haulage service, prior arrangements should be done for alternative methods such as private companies.



Figure 3.2. Kyasamaballi vilage

In regard with “**Managing Efficient Garbage Disposal System**”, we approached people in the designated place and created awareness by guiding them in a proper manner.



Figure 3.3 Discussion on waste management



Figure 3.4. Surrounding waste

Some of the key points to achieve effective waste management are discussed below.

- ❖ The best way of dealing with waste both economically and environmentally is to avoid creating it in the first place.
- ❖ For effective waste management and waste minimization, reuse, recycle and energy recoveries are more sustainable methods than the conventional landfill or dumpsite disposal technique.
- ❖ The key to efficient waste management is to ensure the proper segregation of waste at the source and to ensure that the waste goes through different streams of recycling and resource recovery processes.
- ❖ To separate the waste as dry waste, wet waste which helps in proper management of waste.
- ❖ The separation of waste reduces the time for recyclable which in turn is good for environment as well.



Figure 3.5. Waste in the vicinity

Then reduced final residue is then deposited scientifically in sanitary landfills. We made an attempt of making people understand about separating decomposable and non – decomposable wastes, minimizing the use of plastic and providing several measures of effective disposal of garbage without creating harm to the environment.

In this point of view, we shared our knowledge with the people of Kyasamballi village about how they must manage efficient garbage disposal system by adopting certain preventive measures.



Figure 3.6. Awareness among villagers

In concern to this we conducted an awareness program as a group to the villagers and educated them about segregation of dry and wet waste and putting it in different bins and handing over it to the municipality vehicle daily in order to have better environment which inturn provides better health.

We visited to individually houses and giving information about sewage disposal. Almost all village onsite sewage disposal are carrying out so it will affect to aesthetic appearance of village. We suggest them to keep clean their surrounding area including drainage, garbage disposal etc.



Figure 3.7 Demonstartion of segregation of waste

After adopting sewage disposal system, which will improve aesthetic appearance of village. The gram panchayat had buid a specific area for monitoring and decomposing of waste which was a highlight of the village. The village had an very systamatic garbage desposing system being an inspiration to the other surrounding villages as well.

The gram panchayat was very peculiar in waste mangaement which reduces the disease in the village and enhances both the environment as wel as health of the people. The waste collection was done everyday and the people had a positive concern towards the environment which shows they concern about the environment they live in.



Figure 3.8. Place for waste disposal

In addition to this we made an attempt to educate the people about the importance of managing effective garbage disposal system by conducting an AICTE Activity Programme.

These are some places we identified on the first day of our visit. We visited some of the places in the village-like school surroundings, road streets, roadside houses, etc. We planned for the next day's activity for respective areas and what process as to be done in those places so that our work will be very interesting, productive and for good results.



Figure 3.9. Waste disposal management



Figure 3.10.. Vicinity of the area

As we saw the spots of the village, we got some idea about the places and how effectively we implement our work. Local people in the village helped us in many ways like guiding the routes and the best way to convey and to reach the village people and some people helped to influence the gram panchayat and School teachers also.



Figure 3.11 Segregated waste

Now talking about the interaction between schoolteachers, principal they responded very significant to us, and they encouraged us very nicely like they gave permission to speak to the school children.



Figure 3.12 Interaction done in school

We enjoyed our day and completed our work, and we tried our level best to reach our goal as we planned the schedule. It was a very good experience to all of us and were atleast able to reach our goal as expected.

Outcome of activities will be improve environment conditions & also it improves esthetic appearance of village



Figure 3.13 Saansad Adarsh Gram Yojana

CSE DEPARTMENT MISSION AND VISION

Department Vision

To advance the intellectual capacity of the nation and the international community by imparting knowledge to graduates who are globally recognized as innovators, entrepreneur and competent professionals.

Department Mission

1. To provide excellent technical knowledge and computing skills to make the graduates globally competitive with professional ethics.
2. To involve in research activities and be committed to lifelong learning to make positive contributions to the society.

PROGRAM OUTCOMES

Engineering Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations. Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

Modern Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

Environment and Sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

CSE DEPARTMENT PROGRAM SPECIFIC OUTCOMES

Problem-Solving Skills:

An ability to investigate and solve a problem by analysis, interpretation of data, design and implementation through appropriate techniques, tools and skills.

Professional Skills:

An ability to apply algorithmic principles, computing skills and computer science theory in the modelling and design of computer-based systems.

Entrepreneurial Ability:

An ability to apply design, development principles and management skills in the construction of software product of varying complexity to become an entrepreneur.

CHAPTER — 4

CERTIFICATE

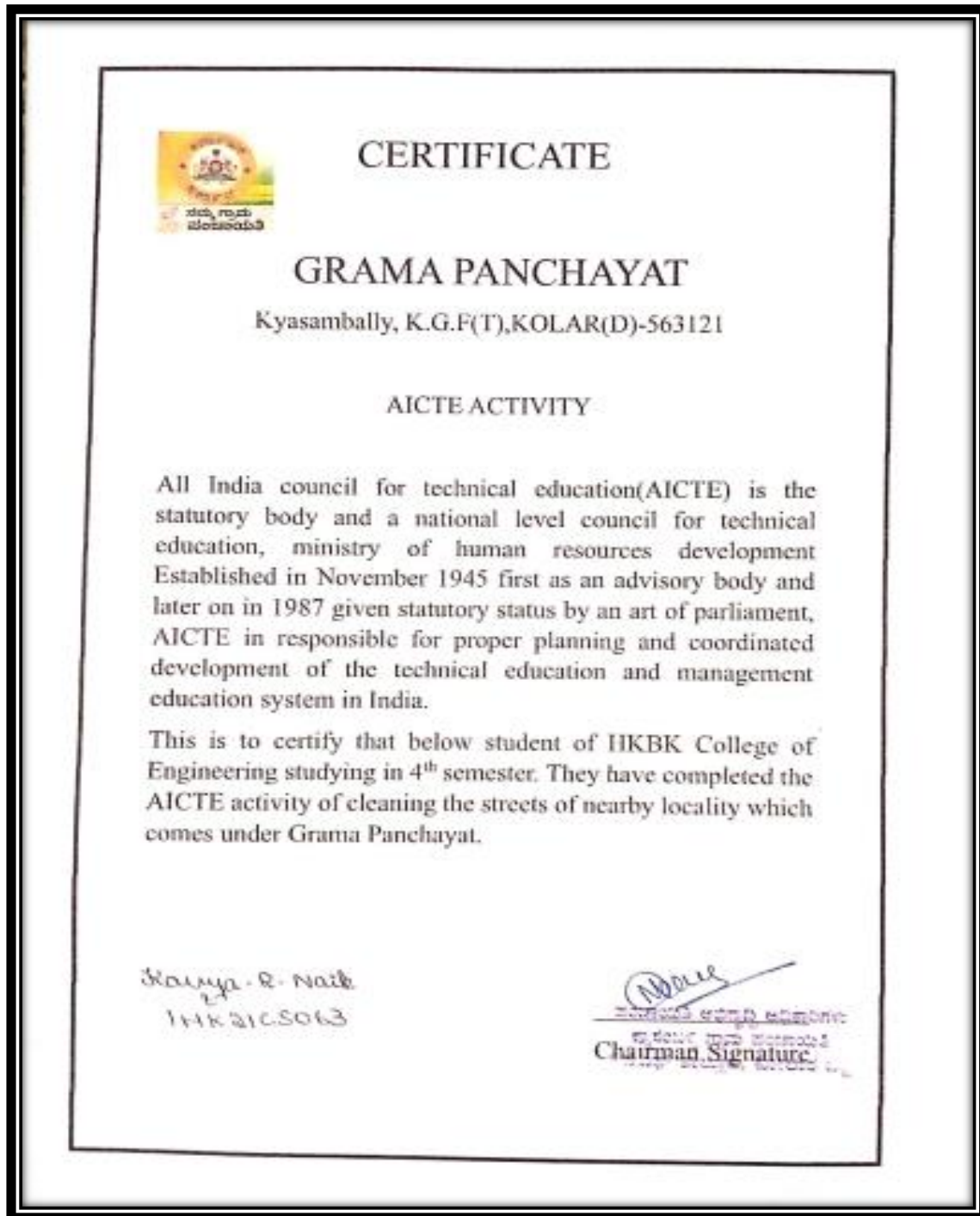


Figure 4.1. Photocopy of the certificate

CONCLUSION

People's attitudes towards waste and understanding of the consequences of poor waste management play a significant role in encouraging their participation in improved solid waste management. By participating in clean-ups, citizens can contribute in creating immediate and long-term solutions for their neighborhoods.

Clean-ups can serve as catalysts for permanent changes in behavior and attitude as well as encouraging communities to adopt good practices such as reuse and recycling, which have a profound effect on waste management in a community. The experience also showed that organizing a clean-up campaign requires careful timeous planning.

Overall, it was concluded that not only did the activity serve the practical purpose of cleaning up, but it also created a greater sense of unity and friendship among community members. A clean-up provides community members an opportunity to bond with one another. It also assists to cross or dissolve racial, cultural, ethnic, and other established neighborhood divides.

Further, the power of beautification in a clean-up campaign would naturally motivate residents to believe that their problems could be solved. This would then result in a shared responsibility for sustainable management of waste and commons at local level. This activity assisted the community to measure (hypothetical) how much control they had over their lives if they worked together for a common goal. Therefore, communities need to consider clean-up campaigns as ongoing activities that they could turn into neighborhood tradition