Research Study: Environmental Baseline of Mid-Day Meal Kitchens

Environmental Synergies in Development (ENSYDE)
2016

Executive Summary

This research project is aimed to evaluate the environmental baseline of mid-day meal kitchens in Bangalore Urban District. Using a sample of 20 kitchens, the ENSYDE team evaluated the current energy, water and waste consumption/management practices to and suggest recommendations.

Most of the small kitchens use LPG, diesel or firewood for cooking. There is a high potential to replace these fuels with solar water heaters partially, which will significantly bring down operating costs, emissions and dependancy on fossil fuels, by increasing the temperature of the water to be heated. The solar water heater has the ability to bring the temperature of water upto 60^{o}C, thereby reducing the use of fossil fuels. Another option evaluated was organic waste briquettes, that may be used in the boilers. This is potentially a good fuel, but several environmental controls will have to be established before use, and supply chains established.

All the kitchens cook food using water which is boiled to produce steam for cooking. Water management (treatment, reuse and recycling) in a majority of the kitchens is lacking. Only a few of the larger kitchens recycle and resuse waste water. The potential for water management is high and the possibility of supplying clean drinking water along with the mid-day meal kitchen could be further explored. Sale of clean drinking water may also be explored as a revenue generation option for the kitchens.

Solid waste management is non-existent in the kitchens that were evaluated barring two large ones. Condsidering that food wastes is the primary category of waste generated, simple composting and or biogas systems may be employed. Vegetable food

gardens/patches may be developed, to reuse the compost. Compost may also be sold to nearby nurseries, or horticultural requirements for additional revenue generation.

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Abstract

Today the global energy scenario is not as encouraging as it was two decades ago. Fossil fuels, by their nature, are limited in supply and will not last us more than a few decades at their current rate of use. In addition, the growing awareness of environmental and health impacts that result from the use of fossil fuels will change consumption patterns in the years to come. Fossil fuels are mainly used in energy generation and transportation. In India, fossil fuels are the main source of energy, with alternative energy sources only recently gaining some prominence.

The mid-day meal scheme in India has given rise to a lot of energy intensive kitchens, which operate almost exclusively on highly polluting fossil fuels. Converting these kitchens into environmentally friendly kitchens is an endeavour that will have high impact on the environment while simultaneously reducing the use of fossil fuels and recurring high costs to the kitchens. Under the guidance of **Environmental Synergies in Development (ENSYDE)**[1]**,** a not-for-profit organisation, a baseline study has been conducted to evaluate energy, water consumption and waste generation patterns in the kitchens operating in Bengaluru Urban District. The study was conducted with the to evaluate the potential technological interventions with cleaner and more efficient systems. This report provides the scope, methodology, assessment and recommendations for the kitchens run by the 15 NGOs undertaking this scheme in Bangalore.

[1] www.ensydeindia.org

Background

The midday meal scheme is an initiative by the Government of India to improve the nutritional status of school-going children nationwide. The programme supplies free lunches on working days for primary and upper primary classes in government, government-aided, local body, Education Guarantee Schemes and alternate innovative education centres, Madarsa and Maqtab supported by the Sarva Shiksha Abhiyaan and National Child Labour Project schools run by the Ministry of Labour. Serving 120 million children in 1,265,000 schools nationwide, it is the largest such programme in the world.

Under Article 24, paragraph 2-C (United Nations, 20 November 1989) of the Convention on the Rights of the Child, to which India is a party (India and United Nations – Human Rights, 2 May 2010), the country had committed to providing adequate, nutritious food for children. The programme entered the planning stages in 2001 and was implemented in 2004. The midday meal scheme covered by the National Food Security Act, 2013, has undergone many changes since its launch.

The midday meal scheme has directly resulted in:

1. Increase in enrolment rates
2. Increase in attendance rates
3. Decrease in malnutrition
4. Decrease in incidence of anaemia and iron-deficiency related illnesses

The scheme has also indirectly resulted in increase in learning levels. These findings were the result of a study conducted by M.S. Ramaiah Medical College as an evaluation of the Akshaya Patra programme in rural Rajasthan.[2]

Objective of the Study

The aim of this study is to understand the environmental baseline of the energy, water consumption and waste generation patterns of the 15 midday meal kitchens in Bangalore (according to the list of NGOs operating in Bangalore, provided by the Department of Public Instruction of Bangalore, Midday Meal Scheme Head Office) in order to obtain information that will help in implementing alternative clean and renewable technologies. The ultimate aim is to use the findings of this study to implement alternative and clean energy technologies in these kitchens to the extent possible, based on geography, energy requirements, available infrastructure, etc.

Scope of the Study

The scope of this study is to evaluate the environmental baseline in mid-day meal kitchens in Bangalore Urban District. Geographical and environmental scope is further described below.

Geographical Scope

The study has been undertaken in Bangalore city, specifically in the areas which fall under the Bangalore Urban District (as per the Department of Public Instruction Midday Meal

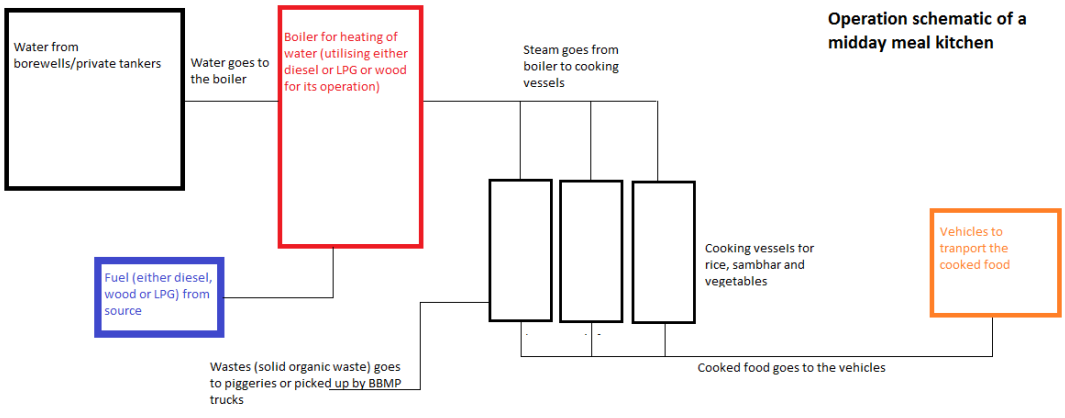
[2] The Impact of School Meals on School Participation: Evidence from Rural India, F. Afridi http://www.isid.ac.in/~pu/dispapers/dp10-02.pdf

Scheme Head Office, Bangalore). In the Bangalore Urban area, there are 20 kitchens of which 15 organizations are actively engaged in the midday meal programme.

The organizations for which information was obtained are listed below –

- Akshaya Patra Organization - Rajajinagar
- Pragathi Foundation Trust – Anekal Town
- Karuna Seva Samithi – HBR Layout
- Integrated Project for Development of People – Nandini Layout
- Asha Kirana Janabhivruddhi Samasthe – Govindapura
- Adamya Chetana – Basavanagudi
- Samarthanam Trust – HSR Layout
- Priya Charitable Trust – Peenya 2nd Stage
- Gilgal Charitable Trust – Nagenahalli
- Taj Charitable Trust – Venkateshpura

Current method of cooking is shown in the Figure below. Water is boiled using fuels, and the steam is used to cook basic rice, sambar (lentil soup) and vegetables.



Environmental Scope

The key environmental parameters that have been studied during this project are -

1. **Energy use**: Various kitchens use different types of fuels for cooking. While most of them have the same technique for cooking which is to heat water , the study focused on the energy use in cooking, lightng and transportation. Specifically data was collected on
    a. Type and amount of fuel used for cooking
    b. Method of cooking, duration of cooking
    c. Number and types of lighting and water pumping motors used
    d. Type of transport used by the kitchens and the fuel used by each vehicle
2. **Water use**: Large amounts of water is used in the kitchens primarily as a result of the technique of cooking. This study assessed the quantity of water used by each kitchen; the end use of the water; water treatment facilities; recycling or reuse systems; etc.
3. **Waste management:** The largest quantum of waste generated in these kitchens is organic in nature. The study briefly evaluated types of waste generated; quantum of each type of waste generated; as well as waste management techniques used by each kitchen.

Methodology of Study

The study was divided into three main parts as described below.

1. **Detailed energy, water and waste survey** – Each kitchen was visited on-site and the manager of the kitchen interviewed. For the interview, a questionnaire was used

(see Annexure). In addition, a list of organizations providing mid-day meals was first procured from the Department of Public Instruction. Where information or contact was not available, the Bangalore Zilla Parishad office provided the data.

2. **Analysis of the data** – Investigations into alternative energy technologies that may be applied, the types of fuels that be used to reduced the carbon footprint, etc., was undertaken. Calculations and preliminary cost analysis has been done and findings evaluated.
3. **Recommendations based on the analyses** – Detailed analysis based on the findings has been conduted for each kitchen as well as generalised recommendations for kitchens as a whole. This along with literature review available on the Internet was used to generate the recommendations.

Baseline - Energy consumption and use

The kitchens in Bangalore operate for an average of 5 hours per day. As the prepared food has to reach the schools by mid-day, all the operations finish early in the morning - between 2:00 am to 6:00 am. Occasionally this may extend to 11:00 am.

In the kitchens surveyed, Liquefied Petroleum Gas (LPG) is the most popular fuel used to boil the water. The most commonly used method of cooking is the steam boiler method, where water is boiled to steam in a boiler from which outlet pipes carry to steam to the vessels in which cooking takes place. Very small kitchens, such as the the Taj Charitable Trust use gas stoves to cook directly, without the use of a steam boiler. The main fuels used by the kitchens are shown the **Table 1** below:

Table 1: Fuels used in Mid-Day Meal Kitchens in Bangalore Urban District

Kitchen/Fuel Type	LPG	Diesel	Wood	Organic waste briquettes	Solar Water Heater
Gilgal	X		X		X
Akshaya Patra		X		X	
Pragathi Foundation	X				
Karuna Seva Samithi	X				
IPDP	X	X			
Asha Kirana Samasthe			X		
Adamya Chetana				X	
Samarthanam Trust	X				
Priya Charitable Trust	X				
Taj Charitable Trust	X				

- Liquified Petroleum Gas (LPG): This is used as the primary fuel in 5 kitchens. It is used as a secondary fuel in the Gilgal Charitable Trust and IPDP kitchens.
- Diesel: This is used as the primary fuel in the Rajajinagar kitchen of Akshaya Patra Organisation and as the primary fuel in the IPDP kitchen.
- Wood: Used as the only fuel in the Asha Kirana Samasthe kitchen and as the primary fuel in the Gilgal Charitable Trust kitchen.
- Organic waste briquettes: Used as the primary fuel in the Kanakapura kitchen of Akshaya Patra Organisation and as the main fuel for the Adamya Chetana kitchen.
- Solar energy: Used to heat water in the Gilgal Charitable Trust kitchen – installed to reduce the use of wood as a fuel.

The main energy consuming points in the kitchens are:

1. Boiling of water for cooking
2. Electricity for the lighting
3. Bore well pumps where used

4. Water treatment, if such a facility is present (rarely)

The secondary energy consumption is the transportation required for the food to be carried to the schools once prepared.

Energy Technology Alternatives

Based on the data collected for each of the kitchens, the energy analysis is focused on evaluating alternative energy options to conventional fossil fuels being used. To this end, a viable energy option is solar energy – specifically, solar thermal energy. This is proven technology and a viable energy source for a variety of applications such as solar heaters. Solar energy has the advantage of being both completely clean (it does not release any harmful emissions), renewable, and inexhaustible.

Another alternative fuel that may be used is organic waste briquettes. These briquettes are manufactured by compacting organic waste at high temperatures and pressures in order to obtain an organic fuel with greater energy density, which could be a viable option to the conventional wood and LPG.

While **LPG** is a relatively clean fuel, and does better in terms of emissions compared to other fossil fuels like diesel and kerosense, the transportation related to delivering the LPG to the customer is heavy, resulting in carbon dioxide emissions and therefore climate change.

Combustion of **wood** leads to very serious emissions (particulates, carbon dioxide, etc.) which is detrimental to human health and the environment. In addition, since the source of

the firewood still continues to be largely from logging and illegal sources, deforestation is of concern. Therefore its replacement with a better, less polluting alternative is imperative.

The **briquettes** made from organic waste release less harmful emissions than the fossil fuels. This is because the organic matter contains carbon that is already present in the carbon cycle – the release of this carbon into the atmosphere does not lead to any added carbon in the atmosphere – it is carbon that would have been released in any case. Biomass briquettes produces much fewer greenhouse gases.[3] Burning of briquettes does, however, still result in emissions of carbon dioxide and is therefore, not as clean as solar energy, with its completely emission-free operation. The briquettes have comparable calorific value to LPG on a per-weight basis[4], and burn as cleanly as LPG. They are however bulkier, and their transport and storage are major concerns. Also because of their organic nature, they can degrade when stored improperly. However, the Adamya Chetana kitchen has shown that it is possible and economically feasible to use these organic waste briquettes to generate energy – they can be incorporated into boilers with minimal changes to the boiler structure and working. The ash produced during burning is handled by running recycled water as a fine spray over the ash, thereby settling it in the exhaust gas stream.

Thus, solar water heaters and briquettes have been investigated for the analysis, following which, a preliminary cost analysis has also been done.

[3] Ref: Montross, Neathery, O'Daniel, Patil, Sowder and Darrell Taulbee – 2010 "*Combustion of Briquettes and Fuel Pellets Prepared from Blends of Biomass and Fine Coal*". International Coal Preparation 2010 Conference Proceeding.

[4] www.gcmachines.com

The kitchens operate for an average of 5 hours, during which boiling water is required to cook the food (the boiling point of water is 100^{o}C).

Option 1 - Solar Thermal

For the solar thermal energy analysis, the inceidence of sunlight was calculated. The location chosen for the analysis was the that of the Gilgal Charitable Trust kitchen in Nagenahalli, Bengaluru. This may be extended to all the locations in Bangalore Urban area with very small changes in the output energy of the panel.

As the next step, the quantum of energy that can be transferred to the water flowing through the pipes under the collector was calculated, by using data on the dimensions of the collector that will meet the energy demand needs to be set. The energy demand is determined by setting the amount of water that needs to be heated per unit time and the temperature to which the water needs to be heated.

For this analysis, we set the flow rate of water as 200 kg per hour, with the water needing to be heated to 60^{o}C. The input temperature of water has been assumed to be 20^{o}C, in order to design the panel which will give the most energy.

The analysis of solar energy resulted in the design of a solar panel with a collector area of 15 metres-squared (5m * 3m), water flow rate of 200 kg/hour, operational for 6 hours in a day. Each panel is capable of heating 1200 litres of water in 6 hours. The water is heated to 60^{o}C, from 20^{o}C and needs to be stored in an insulated tank.

With the water pre-heated by the solar water heater to 60^{o}C, the fuel required to take the temperature up to 100^{o}C is greatly reduced – by 25% reduction in firewood use, as is shown

in the case of the Proof of Concept case in Gilgal Trust where this has been implemented. Through this intervention, 20 tonnes of CO2e has been reduced.

Option 2 – Organic Briquettes

The briquettes are taken to have a calorific value of 3600 kcal/kg, based on studies conducted which show that organic waste briquettes have a calorific value between 3000 to 4900 kcal/kg.

Also, the cost of briquettes has been obtained from online vendors and information from Adamya Chetana, putting the price at around Rs. 6000/tonne or Rs. 6 per kg.

Organic briquettes used have a potential in cities where solid waste disposal is a problem, such as Bengaluru. The organic briquettes are not easily available and they have to be transported which increases costs and emissions from this supply chain which is not well developed.

Key Observations

A majority of these kitchens use LPG for heating water, while a few of them use LPG directly to cook food and some use briquettes or firewood. There is a potential to increase the temperature of water through the application of solar water heaters, to therefore reduce the primary fuel requirement, as well as costs. This will have a direct bearing on the environmental impacts. This may be applied for those kitchen's using LPG, briquettes, or diesel directly for cooking or water heating.

Akshaya Patra Organisation and Adamya Chetana kitchens being largely energy efficient using renewable energy. All the other kitchens are small, inefficient and their operational

costs related to energy is very high (despite the subsidy received by the government on fuel and raw material).

1. **Energy:** The number of children serviced through these kitchens is ~ 300,700. On an average, the energy utilization per child is variable depending type of fuel and also the efficieny of the technology used in the kitchens. Fuel use is variable, but accessability and ease of use play a huge part in deciding what fuel the kitchen uses. Even though LPG is a popular option, the costs are high, supply chain while well established, carries the huge burden of emissions from transport. Solar water heaters while high on cap-ex, the op-ex is low if not negligible. Solar is on-site, long term and clean option, which may be considered as a total alternative or in hybrid with LPG to ensure use during monsoons or high cloud cover.
2. **Costs & Savings**: The average cost of fuel per child works ranges between Rs. 6/child/day to Rs. 250/child/day. This variation is based on the type of fuel used and the number of children serviced. This is a huge cost to the exchequer and has a huge environmental impact. By implementing the solar option, the potential savings would be variable for each kitchen by large enough (25-40% savings) with a payback of about 1 year.
3. **Environment:** There is a potential to reduce carbon emissions upto 100% from the use of solar water heaters depending on the extent of fossil fuel replaced. In addition, particulate matter and emissions resulting from transportation of the fuel will be reduced greatly.

These methods are applicable across all the kitchens, thus, while specific observations and recommendations have been made, the methodology followed can be replicated even for the ones about which information was not obtained.

The data for each mid-day meal kitchen surveyed has been given below in **Table 2**.

Table 2: Basic Data on Mid-Day Meal Kitchens in Bangalore Urban District

Name of organisation	Location	No. of children catered to	No. of operational days in a year	Method of cooking	Daily water usage (Lit)	Type of fuel used	Amount of fuel used	Expenditure on fuel (Rs.)
Akshaya Patra	Yeshwanthpur	180,000	220 to 240	Direct steam injection	150,000	Diesel, organic waste briquettes	700L diesel, 3,500 Kg briquettes daily	N/A
Gilgal Trust	Nagenahalli	3,000	240	Steam boiler	3,000	Wood, LPG, solar	200 Kg of wood daily, 1 cylinder (14.2L) weekly	28,000 monthly
IPDP	Nandini Layout	6,700 to 7,200	228 to 232	Steam boiler	6,000	Diesel, LPG	25 to 30L diesel, 1 cylinder (14.2L) LPG daily	2,500 daily
Karuna Seva Samithi	HBR Layout	10,000	220	Steam boiler	8,000	LPG	7 cylinders (14.2L each) daily	5,000 daily
Asha Kirana Samasthe	Govindapura	4,000	220 to 240	Steam boiler	5,000	Wood	600 Kg daily	700 daily
Taj Charitable Trust	Venkateshpura	1,000	220	Gas stoves	1,200	LPG	1 cylinder (14.2L) daily	850 daily
Pragathi Foundation	Anekal Town	10,000	220 to 240	Steam boiler	7,000	LPG	12 cylinders (14.2L each) daily	6,600 daily

Samarthanam Trust	HSR Layout	7,000	220 to 240	Steam boiler	8,000	LPG	5 cylinders (14.2L each) daily	3,500 daily
Priya Charitable Trust	Peenya 2nd Stage	6,500	220	Steam boiler	12,000	LPG	38 cylinders (14.2L each) monthly	22,040 monthly (at 580 per cylinder)
Adamya Chetana	Basavanagudi	72,000	220	Steam boiler	50,000	Organic waste briquettes	1,500 Kg daily	9,375 daily

Source: Collected on site, 2016

Water Usage in Mid-Day Meal Kitchens

Water is a major resource used in the mid-day meal kitchens. Water usage is variable, dependent on the number of children been fed. Usage ranges from 1,200 liters per day to 150,000 liters per day in the kitchens that were surveyed in this study. The water is used for cooking of the food items, cleaning the utensils, cleaning the kitchen floor, washing the vehicles and pre-processing of the food.

Key Observations

1. **Water Usage:** A large amount of water is utilised by each kitchen daily, ranging between 1,200 litres daily for the Taj Charitable Trust kitchen to 150,000 litres a day for the Akshaya Patra Foundation kitchen. In some cases, like in the Gilgal Charitable Trust kitchen, the water is also used domestically by the people living there.
2. **Water Recycling/Treatment:** In general, the purposes for water usage remain common across all the kitchens. Other than in the Akshaya Patra and Adamya Chetana kitchens, there is no method of water recycling, the water is utilised once

and then let off as waste, unusable water. Six of the organisations draw their water from nearby borewells while the others buy the water from private sellers. It was observed that six (6) of the kitchens surveyed have no water treatment facility at all, three (3) have an active R.O. system, and at the IPDP kitchen installation of R.O. is still ongoing.

Table 4 shows the quantity, source and water consumption points in the kitchens surveyed.

Name of organisation	Amount of water used kl/day	End uses of water	Water source	Water treatment facility
Akshaya Patra Foundation	150	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Bought externally	In one kitchen
Pragathi Foundation	7	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Borewell	No facility
Gilgal Charitable Trust	3	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Privately bought	No facility
Samarthanam Trust	8	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Borewell	No facility
Adamya Chetana	50	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Bought externally and from storage and water bodies	No facility
IPDP	6	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Borewell	R.O. system to be installed
Asha Kiran	5	Cooking, cleaning,	Borewell	R.O. system present
Taj Charitable Samasthe Trust	1.2	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Borewell and public tap	No facility
Karuna Seva Samithi	8	Cooking, cleaning, pre-processing of	Private tankers	No facility

Priya Charitable Trust	12	Cooking, cleaning, pre-processing of vegetables, washing of utensils	Borewell	R.O. system present

In the Adamya Chetana kitchen, the water is recycled for use in gardening, cleaning of boiler fumes, washing vehicles, and preliminary cleaning of cooking utensils. This could be followed by every kitchen, having a huge impact on the water consumption.

1. **Water conservation:** Each of these kitchens could esily install rain water harvesting systems to either collect water for cleaning and supplement other water sources, or for recharging their borewells. A simple water treatment and recycling system will help impact the amount they spend on water, which is also getting to be a scarce resource in itself.
2. **Water-energy nexus:** With effecting water recycling systems, the kitchens will spend less on water pumping costs. Planned storage systems and solarization of water pumps will reduce the environmental impact of diesel powered water pumps, as well as bring down pumping costs.
3. **Water treatment:** Many simple systems are available for treating water for use as well as for reuse. Input water from borewells, tankers, or the piped water sources, are polluted (no specific study has been done for these kitchens to evaluate the types and extent of pollution), which may be treated through simple systems. An R.O. system is expensive and many times not necessary for the level of operations and cooking in these kitchens. Also, there is a lot of non-revenue water loss from R.O. systems that need to be kept in mind. Simple systems to remove organic content (BOD) from the used water, will help save water for the kitchen.

Alternatively, this some of this water can also be used to grow vegetables within the premisis of the kitchen (where space is available) for use in the kitchen itself.

4. **Water Recycling:** Compact and low cost water recycling systems are available that may be installed at the kitchens. This will help bring back 80-90% of the water for reuse.

Solid Waste Management

The type of solid waste generated is common throughout the kitchens to a very large extent – vegetable peels, shells, wasted food, spillages, etc. The amount of waste generated per kitchen is an extremely variable number, ranging from 6 kgs – 5000 kgs of solid waste a day.

Observations

- The way the waste is disposed of is similar in most of the kitchens. None of the kitchens have any waste recycling or reuse methods in place during the operations. The Adamya Chetana kitchen has developed a method of disposing waste where the waste is fed into an in-house biogas generator. The waste feed rate is about 100 to 200 kg per day of solid organic waste. They had earlier adopted systems to dispose the waste by sending to the piggeries.
- Eight (8) of the kitchens surveyed dispose the waste by handing it over to the Corporation or Bruhat Bengaluru Mahanagara Palike garbage trucks of which the IPDP kitchen also disposes the waste by supplying it to nearby piggeries. The Gilgal Charitable Trust kitchen disposes waste by feeding it to nearby cattle and stray animals.

The solid waste data has been tabulated below -

Table 5 – Solid Waste data

Name of organisation	Amount of waste generated (kgs)	Type of waste	Method of disposal
Akshaya Patra Foundation	5420	Solid waste - peels, wasted food, spillages	Municipal corporation
Pragathi Foundation	15	Solid waste - peels, wasted food, spillages	BBMP trucks
Gilgal Charitable Trust	6	Solid waste - peels, wasted food, spillages	Fed to nearby animals
Samarthanam Trust	30 - 50	Solid waste - peels, wasted food, spillages	BBMP trucks
Adamya Chetana	100 - 200	Solid waste - peels, wasted food, spillages	Biogas generator, piggeries, goshalas
IPDP	100 - 200	Solid waste - peels, wasted food, spillages	Piggeries, BBMP trucks
Asha Kiran Samasthe	50	Solid waste - peels, wasted food, spillages	BBMP trucks
Taj Charitable Trust	25	Solid waste - peels, wasted food, spillages	BBMP trucks
Karuna Seva Samithi	25 - 40	Solid waste - peels, wasted food, spillages	BBMP trucks
Priya Charitable Trust	30- 40	Solid waste - peels, wasted food, spillages	BBMP trucks

Suggested Interventions

1. The solid waste generated may be reduced by employing more efficient methods in the kitchens – minimising spillages during operations, packaging more carefully and segregating the wastes properly so that recycling can become easier.
2. Recycling of the wastes may not be possible directly, but the organic wastes can be sent to manufacturers to turn into briquettes, or to convert to biogas in biogas generators.

3. Simple pit composting may be undertaken on-site to reduce the transportation of wastes and resulting leakages.
4. Compost generated may be used for on-site vegetable gardens where space is available, or sale to nearby nurseries for some additional revenues.

Conclusions

Understanding the energy and water consumption patterns in the mid-day meal kitchens, as well as waste disposal systems, the baseline operations to manage these resources clearly indicates simple effective ways to reduce resource consumption, costs and environmental impacts.

There is a massive advantage in introducing solar water heaters for pre-heating water which is the main method of cooking. Where possible it is recommended that briquettes may be utilized. The use of firewood, kerosene and diesel may be completely replaced by using a hybrid of solar and LPG; or solar and organic briquettes. This is cost effective as well as environmentally friendly.

A large amount of water is also used in these kitchens, with a great stress on the underground water table, as several kitchens use water from bore wells. The water needs to be recycled in order to prevent water shortages for these kitchens. Several recycling technologies exist, they are being used by the Akshaya Patra and Adamya Chetana kitchens. The other kitchens need to implement some of these techniques to save and conserve water.

Solid waste is being managed sustainably only by the Adamya Chetana kitchen, which disposes of the waste by feeding it to a biogas generator. The organic wastes can be sent to manufacturers to turn into briquettes, or to convert to biogas in biogas generators.

References

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ANNEXURE – Kitchen-wise data

NAME OF ORGANISATION	**The Akshaya Patra Foundation**
ADDRESS	No. 72, 3rd floor, 3rd Main Yeshwanthpur Industrial Suburb Mahalaxmi Layout Bangalore - 560022
PERSON IN CHARGE	Kitchen manager
NAME	Arun Kumar
CONTACT NUMBER	+918494918836
E-MAIL ADDRESS	arun.k@akshayapatra.org
NUMBER OF CHILDREN CATERED TO	1,80,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	Bangalore – 1,131 schools, out of which – 32 schools in Anekal, 20 in Kanakapura, 47 in BBMP.
NO. OF OPERTATIONAL DAYS IN A YEAR	220 – 240 days
ENERGY DATA	
METHOD OF COOKING	Steam (Direct Steam Injection).
TYPE OF FUEL(S) USED	1) Rajajinagar kitchen – Diesel. 2) Kanakapura road kitchen – Briquettes.
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/litres)	1) Rajajinagar kitchen – 700L of diesel. 2) Kanakapura road kitchen – 3,500Kg of briquettes. 3) 12,000L in one consignment from Indian Oil Corp.
EXPENSES ON FUEL (RS.)	
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	Locations at close proximity to oil extraction sites, such as Tumkur.
HOURS OF COOKING	6 hours (2 a.m. to 8 a.m.)
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) Power consumed – 11,250 units per month – this is an average for both the kitchens. 2) Vehicle data a) 24 trucks in Rajajinagar b) 36 trucks in Vasantha Nagar 3) The trucks are TATA 407s or

	SWARAJ MAZDA 407s. 4) Expenditure – 8 - 10 Lakh rupees per month for both the kitchens. Rate of diesel - 55.65 rupees per litre.
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	150KL per day, except on Sundays.
END USES OF WATER (LITERS)	1) Processing 2) Cooking 3) Cleaning of utensils 4) Cleaning of vegetables 5) Washing of peels
SOURCE OF WATER (BWSSB/BOREWELL)	Bought externally (source not disclosed)
WATER TREATMENT FACILITY Y/N	The Kanakapura road kitchen has a water treatment facility.
EXPENDITURE ON WATER (RS.)	Rs. 2,00,000 per month, per kitchen.
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Solid waste, such as – a) Cooked food returned from schools, unconsumed b) Spillages during cooking, etc. c) Vegetable peels.
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	1) 1920Kg/month – generated at the kitchens themselves – peels of vegetables, etc. 2) 3500Kg/month – spillages during packaging, transport, etc.
CURRENT METHOD OF WASTE DISPOSAL	Municipal corporation
COST OF DISPOSAL (RS.)	Rs. 50,000 – Rs. 60,000

NAME OF ORGANISATION	Adamya Chetana – Smt. Girija Shastri Memorial Trust
ADDRESS	BBMP Community Hall Gavipuram Guttahalli Bangalore - 560019
PERSON IN CHARGE	
NAME	Shreya Rao
CONTACT NUMBER	+919449867954
E-MAIL ADDRESS	
NUMBER OF CHILDREN CATERED TO	72,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED/NUMBER OF SCHOOLS SUPPLIED TO	324
NO. OF OPERTATIONAL DAYS IN A YEAR	220
ENERGY DATA	
METHOD OF COOKING	Steam Injection Method
TYPE OF FUEL(S) USED	Briquettes from organic wastes
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (Kgs/litres)	1,500 Kg
EXPENSES ON FUEL (RS.)	Rs. 625/Kg
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	Magadi Road (8 to 10 Km)
HOURS OF COOKING	2.30 a.m. to 6.30 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 10 – 12 lights which are solar lights 2) 5 2hp motors pump water from the 3 water sources present there. 3) A 10hp motor is used for the boiler. 4) 24 trucks (of which one is a three wheeled goods auto) are hired at Rs. 650 per day, per truck
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	50KL daily
END USES OF WATER (LITERS)	1) Washing utensils 2) Washing vegetables, rice, etc. 3) Cooking

	4) Cleaning of utensils 5) Washing of vehicles 6) Gardening
SOURCE OF WATER (BWSSB/BOREWELL)	1) BWSSB 2) 3 water sources near the kitchen, each of which provides 15 to 20,000L of water per day.
WATER TREATMENT FACILITY Y/N	Not present
EXPENDITURE ON WATER (RS.)	Rs. 10,000- Rs. 12,000/ month.
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	1) Wet wastes 2) Dry wastes such as paper, plastics, etc. – solid wastes
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	Vegetable and organic wastes – around 100 kg/day
CURRENT METHOD OF WASTE DISPOSAL	1) Piggeries, goshalas (earlier) 2) Biogas generation plant (for the last year).31
COST OF DISPOSAL (RS.)	

NAME OF ORGANISATION	**Asha Kirana Janabhivruddhi Samsthe**
ADDRESS	Govindapura, Veerannana Palya Main Road, Bangalore - 560045
PERSON IN CHARGE	
NAME	Fairoz
CONTACT NUMBER	9972415804
E-MAIL ADDRESS	ashakiranasamasthe@gmail.com
NUMBER OF CHILDREN CATERED TO	4,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	30
NO. OF OPERTATIONAL DAYS IN A YEAR	220 to 240
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	Wood
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	600 Kg daily
EXPENSES ON FUEL (RS.)	Rs. 700 daily
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	6 Km
HOURS OF COOKING	5.00 a.m. to 8.00 a.m
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 25 lights - 35W CFL lights 2) One pump - 1 hp 3) 3 trucks, all running on diesel - daily expenditure on diesel for all the 3 trucks combined is Rs. 500 daily.
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	5
END USES OF WATER (LITERS)	Cooking, cleaning, washing of vegetables, utensils, vehicles
SOURCE OF WATER (BWSSB/BOREWELL)	Borewell
WATER TREATMENT FACILITY Y/N	R.O. system treatment facility
EXPENDITURE ON WATER (RS.)	N/A
SOLID WASTE DATA	

TYPE(S) OF WASTE GENERATED	Solid waste (food waste, vegetable waste such as peels)
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	50 Kg
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	Rs. 500 monthly

NAME OF ORGANISATION:	Gilgal Charitable Trust
ADDRESS	No. 52/53 Balaji Layout, Nagareshwara - Nagenahalli, Bangalore 560052
PERSON IN CHARGE	
NAME	Anita K.N.
CONTACT NUMBER	9886479773
E-MAIL ADDRESS	anita.gilgal@gmail.com
NUMBER OF CHILDREN CATERED TO	3,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	11
NO. OF OPERTATIONAL DAYS IN A YEAR	240
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	Wood, LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	Wood - 200 Kg daily, LPG - 1 cylinder weekly (14.2L weekly
EXPENSES ON FUEL (RS.)	Rs. 28000 monthly
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	2 Km for wood, 10 Km for LPG
HOURS OF COOKING	4.00 a.m. to 9 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 10 lights 2) One pump 3) Rs. 1400 to Rs 1870 per month is the bill amount - with 223.71 and 261.91 units used respectively 4) 1 truck that totally covers 60 Km, with the expenditure on diesel for the truck being Rs. 500 daily.
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	3

END USES OF WATER (LITERS)	Washing, cooking, cleaning, pre-processing, domestic use by 4 people living there
SOURCE OF WATER (BWSSB/BOREWELL)	Privately bought
WATER TREATMENT FACILITY Y/N	No water treatment facility
EXPENDITURE ON WATER (RS.)	Rs. 11000 to Rs. 12000 monthly
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Vegetable peels, rice, spillages, other food items.
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	6 Kg daily
CURRENT METHOD OF WASTE DISPOSAL	Fed to nearby animals
COST OF DISPOSAL (RS.)	N/A

NAME OF ORGANISATION:	Integrated Project for Development of People.
ADDRESS	No. 103, 8th Main, 4th Block, Nandini Layout, Bangalore 560096
PERSON IN CHARGE	
NAME	Bheema K.
CONTACT NUMBER	9341495716
E-MAIL ADDRESS	ipdpblr@gmail.com
NUMBER OF CHILDREN CATERED TO	6700 to 7200
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	83
NO. OF OPERTATIONAL DAYS IN A YEAR	228 to 232
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	Diesel for cooking, LPG for masala preparation
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	25 to 30L diesel, 1 cylinder daily (cylinder is 14.2L).
EXPENSES ON FUEL (RS.)	Rs. 2500 per day
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	1 Km
HOURS OF COOKING	5.30 a.m. to 10.30 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 4 lights presently, 8 in the new one 2) One pump - 3hp 3) 7 vehicles - 3 3 wheelers, 4 TATA S model trucks, the smaller vehicles travelling upto 15Km one way, the larger ones travelling upto 35 Km. 6 vehicles owned by IPDP - the 3 wheelers cost Rs. 150, 200, 250 per day, the TATAs - Rs. 400 per day. The 7th hired vehicle - Rs 1500 per day.
WATER DATA	

AMOUNT OF WATER USED DAILY (KL)	6
END USES OF WATER (LITERS)	Cooking, cleaning, washing vegetables, washing vehicles.
SOURCE OF WATER (BWSSB/BOREWELL)	Borewell
WATER TREATMENT FACILITY Y/N	At present, no, but an R.O. system will be installed in July
EXPENDITURE ON WATER (RS.)	N/A
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Rice, vegetable wastes, cooking wastes - production wastes.
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	100 to 200 Kg
CURRENT METHOD OF WASTE DISPOSAL	Piggeries, BBMP
COST OF DISPOSAL (RS.)	Rs. 600

NAME OF ORGANISATION:	Karuna Seva Samithi
ADDRESS	#1016, 1st Stage, 2nd Block, HBR Layout, KG Halli, Bangalore - 560045
PERSON IN CHARGE	
NAME	P. Sumithra
CONTACT NUMBER	9379258133
E-MAIL ADDRESS	karunaseva24@gmail.com
NUMBER OF CHILDREN CATERED TO	10,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	50
NO. OF OPERTATIONAL DAYS IN A YEAR	220
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	7 cylinders daily (14.2L)
EXPENSES ON FUEL (RS.)	Rs. 5000 monthly
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	Lingarajapuram (3Km)
HOURS OF COOKING	4.30 a.m. to 11.00 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 5 lights 2) Electricity bill is Rs. 800 per month 3) 4 vehicles - TATA ACS. Each vehicle runs 80 to 100Km per day, with Rs. 500 per day per vehicle spent on fuel
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	8
END USES OF WATER (LITERS)	Cooking, cleaning, washing vegetables, washing vehicles.
SOURCE OF WATER (BWSSB/BOREWELL)	Private tankers

WATER TREATMENT FACILITY Y/N	No water treatment facility
EXPENDITURE ON WATER (RS.)	Rs. 700 daily
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Food, vegetable peels, etc - solid waste
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	25 to 40Kg daily
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	Rs. 1,000 a month

NAME OF ORGANISATION:	Pragathi Foundation
ADDRESS	#240, Attibele Main Road, Anekal Town, Anekal 560106
PERSON IN CHARGE	
NAME	H.P Vernekar
CONTACT NUMBER	7411230824
E-MAIL ADDRESS	pragathifoundationmdm@gmail.com
NUMBER OF CHILDREN CATERED TO	10,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	82
NO. OF OPERTATIONAL DAYS IN A YEAR	220 - 240
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	11 to 12 cylinders (14.2L) daily
EXPENSES ON FUEL (RS.)	Rs. 550 per cylinder
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	1.5 Km
HOURS OF COOKING	4 a.m. to 10 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 6 lights 2) One 3 hp pump, one 4 hp submersible pump 3) 5 vehicles - minitrucks. They travel a maximum of 20 Km per day as per the organisation. The cost per day is from Rs. 600 per day to Rs. 800 per day
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	6 to 7
END USES OF WATER (LITERS)	Cooking, cleaning, washing utensils, food items, etc.
SOURCE OF WATER (BWSSB/BOREWELL)	Borewell
WATER TREATMENT FACILITY Y/N	No water treatment facility

EXPENDITURE ON WATER (RS.)	Rs. 800 to Rs. 1000 per day when borewell is not operational.
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Solid wastes - cooked food returned from schools, spillages, vegetable peels, rice, etc
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	15 Kg
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	Rs. 100 a month

NAME OF ORGANISATION:	Priya Charitable Trust
ADDRESS	#104, 1st Main, 5th Cross, Annapoorneshwarnagar 2nd Stage, Thigaralapalya, Peenya 2nd Stage, Bangalore - 560058
PERSON IN CHARGE	
NAME	Ravindra Kumar N
CONTACT NUMBER	9972525814
E-MAIL ADDRESS	priyacharitabletrust2013@gmail.com
NUMBER OF CHILDREN CATERED TO	6,500
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	33
NO. OF OPERTATIONAL DAYS IN A YEAR	220
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	5 cylinders (14.2L) on 4 days of the week, 6 cylinders daily for the other 3 days
EXPENSES ON FUEL (RS.)	Rs. 580 per cylinder
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	5 Km
HOURS OF COOKING	4.30 a.m. to 8.30 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 8 lights - 36W 2) One pump - 2 hp 3) 100L per hour - R.O. system 4) 3 vehicles - 207, 407, Mahindra Maxima, with a total of Rs. 2000 per day for all three vehicles. Each vehicle travels 18Km one way
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	10 to 12
END USES OF WATER (LITERS)	Washing, cleaning, pre-processing, cooking
SOURCE OF WATER (BWSSB/BOREWELL)	Borewell
WATER TREATMENT FACILITY Y/N	R.O. system - 100L/hour capacity

EXPENDITURE ON WATER (RS.)	Rs. 24000 every 3 months for the R.O. system's membrane repacement
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Vegetable peels, rice, packaging troubles, spillages, etc.
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	30 to 40 Kg of solid waste daily
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	Nominal fee

NAME OF ORGANISATION:	Samarthanam Trust for the Disabled
ADDRESS	#39, 15th Cross, 16th Main HSR Layout Bangalore - 560102
PERSON IN CHARGE	
NAME	Krishnaiah
CONTACT NUMBER	+919449864776
E-MAIL ADDRESS	krishnaiahtm@samarthanam.org
NUMBER OF CHILDREN CATERED TO	7,000
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED – NUMBER OF SCHOOLS	51
NO. OF OPERTATIONAL DAYS IN A YEAR	220 – 240 (6 days a week)
ENERGY DATA	
METHOD OF COOKING	Steam boiler method
TYPE OF FUEL(S) USED	LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (Kgs/litres)	4 – 5 cylinders daily, each cylinder has a capacity of 16.4L
EXPENSES ON FUEL (RS.)	Rs. 3,500 daily
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	Indian Oil Corporation (10-12 Km away)
HOURS OF COOKING	4 – 5 hours (3 a.m. to 8 a.m. generally)
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) Lights – 6 lights each of 40W 2) 1 pump – 3 hp 3) 4 vehicles – travel 40 Km a day. a) 1 Bolero – Rs. 250 – 300 per day on fuel b) 3 trucks from vendors – Rs. 800 – 850 per day per truck on fuel 4) Each vehicle will travel 40 Km a day.
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	8 KL per day
END USES OF WATER (LITERS)	1) Washing of vegetables and rice 2) Cleaning of utensils 3) Cooking of food

SOURCE OF WATER (BWSSB/BOREWELL)	Borewell
WATER TREATMENT FACILITY Y/N	No water treatment facility
EXPENDITURE ON WATER (RS.)	On days when there is a problem with the pump or maintenance work is going on, the expenditure on water is Rs. 1,400 per day.
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Solid food wastes such as – a) Peels b) Spillages c) Packaging wastages
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	30 – 50 Kg of food (solid) waste per day
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	No expenditure on disposal of waste

NAME OF ORGANISATION:	Taj Charitable Trust
ADDRESS	#25 Someshwar Lane 1st Cross, Bharath Matha Layout, Venkateshapuram, Bangalore 560045
PERSON IN CHARGE	
NAME	Fahimulla Aslam
CONTACT NUMBER	9742573028
E-MAIL ADDRESS	aseemMaz@gmail.com
NUMBER OF CHILDREN CATERED TO	1,000 this year
LOCATION/ADDRESS OF SCHOOLS TO WHICH FOOD SUPPLIED	4 Govt. schools, 2 Govt. aided schools, 1 high school - 7 in total
NO. OF OPERTATIONAL DAYS IN A YEAR	220
ENERGY DATA	
METHOD OF COOKING	LPG (using gas stoves)
TYPE OF FUEL(S) USED	LPG
AMOUNT OF FUEL SOURCED DAILY/MONTHLY (kgs/liters)	1 cylinder daily (14.2L)
EXPENSES ON FUEL (RS.)	Rs. 850 per cylinder
POINT OF ORIGIN OF FUEL (KM FROM KITCHEN)	3 Km
HOURS OF COOKING	6 a.m. to 9 a.m.
OTHER ENERGY CONSUMING POINTS - **LIGHTING (NOS. & TYPE/WATT)** - **PUMPING (NOS. & HP CAPACITY)** - **TRANSPORT VEHICLES (NOS., TYPE, KMS RUN PER MONTH, FUEL, COST)** - **OTHER (SPECIFY)**	1) 5 lights - 100W 2) One pump of 1 hp motor 3) 1 Maruti van 1 auto. They travel 5 Km round trip. Auto is hired at Rs. 300 per day, fuel expense is Rs. 500 per day
WATER DATA	
AMOUNT OF WATER USED DAILY (KL)	1.2 (1 KL from borewell, 0.2 KL Cauvery water - tap water)
END USES OF WATER (LITERS)	Washing, cleaning cooking, milk preparations, etc.
SOURCE OF WATER (BWSSB/BOREWELL)	Borewell and public tap
WATER TREATMENT FACILITY Y/N	No water treatment facility
EXPENDITURE ON WATER (RS.)	N/A
SOLID WASTE DATA	
TYPE(S) OF WASTE GENERATED	Vegetable peels, rice, spillages, other

	food items.
AMOUNT OF WASTE (DATA BY CATEGORY OF WASTE)	20 to 25 Kg
CURRENT METHOD OF WASTE DISPOSAL	BBMP trucks
COST OF DISPOSAL (RS.)	Rs. 10 daily