**Investigation on Household Waste Management and the Effects of Compost and Dilute Parts of Waste on the Growth of Plants**

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ABSTRACT

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| **Aims:** Massive populations have led to an increase in open landfills and spreading waste in cities and communities. The purpose of the study was to quantify the amount of compost that can be produced from the examined household trash and to ascertain the effects of compost and plant dilution derived from household wastes. **Design and Duration:** The recorded data of parameters in every 10 days for 6 months and there found strong correlation between those parameters. A selected parameter was then measured and recorded after six months (February-July 2024) of observation and nursing, and a correlation was made between the recorded and measured. **Methodlogy:** 15 households were selected of Bangladesh Ordinance Factory residential area in Gazipur city where three bins were provided, 1st for raw kitchen waste/organic waste, and 2nd for the plastic waste and 3rd for the E-waste. Wastes were collected and weighted them periodically. The collected kitchen waste was recycled into compost and dilution and tested them in laboratory of the Department of Environmental Science, Bangladesh Agricultural University, Mymensingh, Bangladesh. Finally, the contents were applied into the two different types of test plant species (chilli and spinach). **Results:** The value associated between family size and kitchen waste was 0.82, and the correlation between income and kitchen waste was 0.04. The amount of garbage produced in the kitchen climbs directly as family size and income increase. Compost had a pH of 6.26, which is less acidic than dilution, which had a pH of 7.4. Compost contains 12.27% organic C and is diluted by 1.12%. Additionally, compost has a dilution of 0.08% and an organic N content of 1.08%, both of which are advantageous for plant growth. Compost used for growing chillies has a moderately favorable link with budding and flower and a strong positive relationship with leaf number, fruit, and leaf size. Height exhibits a very weak link with spinach leaf size and a strong positive correlation with fruit. Height, leaf number, leaf size, blossoming, and fruit all showed a very strong positive correlation when spinach and chillies were sprayed in dilutions. It is evident that plants benefit from both compost and dilution, but that plants like spinach or chillies benefited more from dilution. **Conclusion:** The study is designed to find way to recycle household wastes. Recycled kitchen wastes to compost and dilution is a big option to reduce huge amount of wastes and on the hand it has great contribution to the home agriculture and in the environment and human health.  |

***Keywords:*** *Composting; Dilution; Plants growth; Pollution; Waste management.*

1. INTRODUCTION

Waste management, which involves handling, storing, gathering, moving, and getting rid of trash (both liquid and solid), is a crucial part of cleanliness (Al-Amin et al., 2024). Waste can be produced by a variety of human activities, including industrialization, urbanization, rising standards of living, etc. (Islam, 2016). According to estimates from 2005, the six main cities in Bangladesh, including Dhaka, Chittagong, Khulna, Rajshahi, Barisal, and Sylhet, produced about 7690 tons of municipal solid waste every day (Alamgir & Ahsan, 2017). Gazipur is densely populated country. The most serious issue that large cities face is solid waste and its effects on the environment. In any of Bangladesh's cities, rubbish that has not been adequately collected by the city administration is just dumped outside (Islam, 2016). Due to this, uncollected waste ends up on roads, canals, rivers, and other public spaces (Tania, 2014; Uddin et al., 2016). The average amount of inorganic garbage produced by the high-income group in emerging countries is higher than the amount produced by slum regions. Moreover, low-income individuals produce very little recyclable waste (Rahman, 2005). The idea that trash from the home could be used as a resource rather than a burden is a smart one (Sujauddin et al., 2008; Miah et al., 2019). Also, integrated solid waste management systems that include a variety of techniques enhance solid waste management systems in any city; there is no one solution to this significant problem (DOE, 2004; Marshall & Farahbakhsh, 2013; Islam, 2016;). Inorganic materials, such as plastic or paper, can be converted and used to meet the industrial sector's demand for recycled materials. Organic materials, on the other hand, can be converted and used as a feedstock to produce renewable energy in the form of biogas for this energy-scarce nation that relies on dwindling natural gas reserves and rising imports of foreign energy sources (Matter et al., 2015; Islam et al., 2018). When digested down to 2.5%, the settlement rate was accelerated and beneficial components like nitrogen and phosphorus, which are used in fertilizers, were released.

The settlement provided a physical separation of the liquid and solid fractions at a reasonable cost as part of the digestate's partial processing (Fernandes et al., 2020). The use of composts in container media has the ability to protect plants from soil-borne root diseases, and compost may encourage the expansion of antagonists in the rhizosphere (Alvarez et al., 1995). The anaerobic digestion (AD) process is a crucial step in the valorisation of organic waste, including food waste, in terms of the production of renewable energy (biogas) and the nutrient-rich residue that can be used as bio-fertilizer. By producing biogas and compost, this method (AD) enables effective recovery of domestic trash. In this article, we attempt to incorporate many important factors affecting the AD process, such as temperature, pH, organic loading rate (OLR), carbon to nitrogen ratio (C/N), and total solid content (TS (%). The objectives of the study were to estimate the compost generation from studied household wastes and also find out the effects of compost and dilution made from household wastes on the growth of plants.

2. material and methods

***2.1 Study area***

The residential section near the Bangladesh ordnance industry in the Gazipur district was chosen as the study area. Gazipur is a district in the Dhaka Division in central Bangladesh. There are 1741.53 km2 there and total population of Gazipur city is 2,674,697 (BBS, 2022). More than 75% of Bangladesh's garment sector is based in the Gazipur region (GCC, 2023). It is situated between the longitudes of 90°09' and 92°39' east and the latitudes of 23°53' and 24°21' north. 45 bins, a scale, 16 12-inch mud pots, wood sticks, green and brown leaves, dirt, water, two 40-liter plastic containers, 2 nets, paper, bottles, a plant with 6 tubs, a measurement tap, etc.

***2.2 Sample collection and preparation***

Raw kitchen garbage, plastic waste, and electronic waste were initially collected from the 15 selected homes over the course of two sessions, or roughly 60 days. The first session (30 days) of raw kitchen waste collection was for the compost preparation and the second session (30 days) of raw kitchen waste collection was for the dilution preparation. The houses were given three bins, and the residents were told to utilize them in different ways: the first bin was for organic or raw kitchen trash, the second bin was for plastic waste, and the third bin was for electronic waste. The weight machine measured the collected waste differently each day, and the total weight was recorded.

***2.3 Steps of compost preparation***

For compost preparation, an anaerobic method was followed and it took about 45 days for being ready to use in plants. The first step of making compost was selecting a mud container. But as the collected waste was much more so 4 mud containers were needed, and each container was 12 inches in size. Drilled around 3-4 holes around the container so as to let some air in easily and water used to wet them was easily drained outside. And partially block the holes with stones to control the compost from being washed out. The second step was filling the first layer with green and brown leaves because this is the natural way to make compost faster. Thirdly use a little bit of compost from the market as an influencer. Then the collected raw kitchen waste was another layer and use soil for the next layer because the soil is the component which will help to make compost easily and push them as much as possible to make sure that there are no air bubbles.

***2.4 Steps of dilution preparation***

The first step for making dilution was to select a 40-litre container including its own veil. Every 30 days kitchen raw waste was collected and kept in it and on the 30th day, water was added to it. Water was added as much as water is needed for the waste to be soaked. Then leave it like this for 10 days to be prepared to apply in the plants. After 10 days dilute part of the waste was filtered from the waste with the help of a net and collected into the bottles.

***2.5 Determining Soil pH with a Glass Electrode pH Meter***

The suspension was mixed several times by adding distilled water to 20 g of soil in a 100 mL beaker over a period of 30 minutes. In order for most of the suspended clay to settle out of the suspension, the suspension was kept upright for about an hour (EPA, 2015). In the clamps of the electrode holder, the electrodes were repositioned. When the electrodes are lowered into the beaker, the glass electrode is partially immersed in the stationary solution. A calomel electrode is immersed in a sufficiently clean supernatant solution to measure the specific pH.

***2.6 Determination of Organic Carbon***

Soil organic carbon was determined by the wet oxidation method. 2g of soil was taken in an Erlenmeyer flask (weighing being made in a fine balance) in duplicate. 10 mL of N K2Cr2O7 solution was added through a pipette. Also added about 20 ml of concentrated H2SO4 using a cylinder. The mixture was shaken well for a minute or two and then allowed to stand on an asbestos sheet for not less than 30 minutes. In the meantime, the strength of FeSO4 solution by titrating against N K2Cr2O7 solution is found as follows:

10 ml. of N K2Cr2O7 Solution was taken in 500 ml. Erlenmeyer flask. About 20 ml. of conc. H2SO4, 200 ml. distilled water and 10 ml. H3PO4 was added through a cylinder. Then 2 ml. (40 drops) of diphenylamine indicator was added when the colour of the contents in the flask will be purplish-blue. FeSO4 solution was added drop by drop from the burette until the colour just flashes to green in one drop of FeSO4 solution added, carry out this experiment in triplicate.

Then come back to earth. After the appropriate time has passed, an excess of N K2Cr2O7 solution is titrated against standard FeSO4. The solution is stated below. Diluted the mass in the flask with about 200 ml. of distilled water, and added about 10 ml. conc. H3PO4 and 2 ml (40 drops) of diphenylamine indicator. Titrated the contents of the flask as before. Repeated the determination with less soil if more than 75 % of the dichromate is reduced.

Organic carbon can be calculated according to the following formula

% Organic carbon = 

Where, V1= Vol. of NK2Cr2O7 solution

 V2= Vol. of XNFeSO4 solution

 N= Normality of FeSO4 solution

 W = Wt. of soil taken and

 1.3 Conventional recovery factor.

As an outcome, organic matter is equal to organic carbon multiplied by 1.73 (Van Bemmelen factor).

***2.7 Determination of organic Nitrogen***

Kjeldahl method was used for determining organic nitrogen (Kjeldahl, 1883). Kjeldahl flask was filled with 0.1 g sample, 5 ml H2SO4 and 1 tab of catalyst and digested for two hours at 40°C. Then cooled and distilled and finally titrated (0.1 HCL). Then the burette reading is collected and N% is determined using the following formula.

$$N=\frac{14×normality og Hcl ×100}{1000×sample wf}$$

***2.8 Data collection and Statistical Analysis***

The data of respective parameters and their average values (mean) were tabulated. Error data were managed accordingly. Correlation relationships were studied using SPSS analysis on obtained data. Table and Charts were represented based on data and their interpretation.

3. results and discussion

**3.1 Correlation between family size, income and generated waste**

Waste collected over 60 days was weighed and recorded daily with a correlation between household size and waste and another between household income and waste. Below are the results of that correlation (Table 1):

**Table 1. Correlation between Family Size, monthly income and Generated Waste**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Family member | Monthly income | KW (KG) | E-Waste (KG) | Plastic (KG) |
| 5 | 60000 | 19.07 | 0.995 | 0.847 |
| 3 | 30000 | 13.081 | 0.83 | 1.032 |
| 4 | 30000 | 13.112 | 0.711 | 0.746 |
| 5 | 40000 | 19.123 | 0.344 | 0.9044 |
| 3 | 75000 | 9.32 | 0.68 | 0.8434 |
| 3 | 35000 | 14.1569 | 2.779 | 1.1738 |
| 1 | 35000 | 0.919 | 0.2653 | 0.286 |
| 4 | 40000 | 12.6024 | 0.388 | 0.873 |
| 5 | 50000 | 17.575 | 0.306 | 1.065 |
| 3 | 40000 | 17.105 | 0.745 | 0.901 |
| 3 | 70000 | 13.444 | 0.948 | 0.956 |
| 4 | 40000 | 14.4107 | 1.547 | 1.014 |
| 5 | 35000 | 14.8069 | 2.02 | 1.0818 |
| 3 | 45000 | 14.1569 | 2.779 | 1.1738 |
| 5 | 42000 | 19.123 | 0.344 | 0.9044 |

Family Size vs Kitchen Waste (Figure 1) correlation value = 0.8280547 which means family size has a strong positive relation with kitchen waste generation. The more the family size increase the more the kitchen waste generation increases. Family Size vs E-Waste Correlation Value = -0.09842044 means family size has a poor negative relationship with E-waste generation. Surprisingly increasing family size has negative relation with E-waste. In Addition, Family Size vs Plastic Correlation Value = 0.4420559 which means family size has a strong positive relationship with plastic waste generation.



**Figure 1. Correlation Matrix between Family Size and Types of Waste**

Income vs Kitchen Waste (Figure 2) correlation value = 0.04223597 that means family income has a strong positive relation with kitchen waste generation. The more the family income increase the more the kitchen waste generation increasing



**Figure 2. Correlation Matrix between Income and Type of Waste**

Income vs E-Waste Correlation Value = -0.1283124 which means family income has a poor negative relationship with E-waste generation. Surprisingly increasing family income has negative relation with E-waste. Income vs Plastic Correlation Value = 0.03232884 which means family income has a positive relationship with plastic waste generation.

**Amount of Compost and Dilution by Recycling Kitchen Waste**

From 15 selected houses about 106.6653 kg of kitchen waste was collected for 30 days and 80 kg of compost was recycled from those wastes. And again, for another 30 days, 105.3405 kg of kitchen waste was collected and 20.8 litter dilutions were made from them. Hence, it is obvious that a significant amount of waste was recycled, and it was a substantial amount. It's a valuable opportunity for us to recycle household waste in a simple way, minimize waste as much as we can, plant trees in the balcony garden and roof garden, and most importantly, contribute to a healthy environment.

**3.2 Six Month Observational Result of Plants**

After six-month observation and nursing those two variants then selected parameter is being measured and recorded where a correlation is being made among the recorded parameter. In below the result of correlation is being described. This study revealed that organic waste can be recycled as compost which has traditionally been used as a soil improver. As more waste is recycled as compost, it is becoming increasingly important to find alternative uses for compost. In the study, it was attempted to ascertain whether organic household trash that contained food scraps (such as citrus fruit and vegetable peels, oil, dairy products, etc.) could be composted in backyard gardens (Neugebauer & Sołowiej, 2017). Kitchen waste was mixed with garden waste (bulking agent) at different proportions. In order to evaluate the process and the quality of the end product, better knowledge of the microbial community dynamics is needed. As the range of ways to utilize compost products is increasing, the demands on compost quality also increase. It has been demonstrated that compost is applied to agricultural fields as long-term fertilizer (Steger et al., 2007).

**Table 2. Analysis of numerous measurements from a chilli compost sample and correlation findings**

|   | Height(inch) | Leaf no. | Leaf Size(inch) | Budding | Flower | Fruit |
| --- | --- | --- | --- | --- | --- | --- |
| Height(inch) | 1.00 |  |  |  |  |  |
| Leaf no. | 0.90 | 1.00 |  |  |  |  |
| Leaf Size(inch) | 0.63 | 0.69 | 1.00 |  |  |  |
| Budding | 0.51 | 0.78 | 0.76 | 1.00 |  |  |
| Flower | 0.53 | 0.43 | 0.25 | 0.16 | 1.00 |  |
| Fruit | 0.73 | 0.80 | 0.28 | 0.43 | 0.18 | 1.00 |

According to Table 2 we get a clear scenario of chilli growth used compost with other parameters. Height has a very strong positive relationship with leaf no, strong positive relationship with Fruit and Leaf Size then moderate positive relationship with Budding and flower. Here Fruit has also very strong positive correlation with leaf no, and strong positive correlation with Budding and leaf no. Again, Leaf size has strong positive correlation with budding. Other’s parameters have very poor and poor positive correlation. The substantial decrease in seed germination, chlorophyll content, and plant development of both ornamentals demonstrated the phytotoxicity of compost (Belda et al., 2013).

**Table 3. analysis of numerous measurements from a chilli dilution sample and correlation findings**

|   | Height(inch) | Leaf no. | Leaf Size(inch) | Budding | Flower | Fruit |
| --- | --- | --- | --- | --- | --- | --- |
| Height(inch) | 1 |  |  |  |  |  |
| Leaf no. | 0.98 | 1 |  |  |  |  |
| Leaf Size(inch) | 0.33 | 0.31 | 1 |  |  |  |
| Budding | 0.95 | 0.94 | 0.21 | 1 |  |  |
| Flower | 0.58 | 0.63 | 0.43 | 0.41 | 1 |  |
| Fruit | 0.81 | 0.78 | 0.51 | 0.76 | 0.49 | 1 |

Chilli’s where dilution (Table 3) is being used height has a positive and very strong correlation with leaf no, budding and fruit. Budding has very strong positive correlation with leaf no, budding has a positive and strong correlation with fruit. Other’s parameters have very poor and poor positive correlation among them.

**Table 4. Analysis of numerous measurements from a chilli blank sample and correlation findings**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Height(inch) | Leaf no. | Leaf Size(inch) | Budding | Flower | Fruit |
| Height(inch) | 1 |  |  |  |  |  |
| Leaf no. | 0.70 | 1 |  |  |  |  |
| Leaf Size(inch) | 0.32 | 0.83 | 1 |  |  |  |
| Budding | 0.78 | 0.91 | 0.71 | 1 |  |  |
| Flower | 0.44 | 0.27 | 0.03 | 0.24 | 1 |  |
| Fruit | 0 | 0 | 0 | 0 | 0 | 1 |

Chilli’s where no fertilizer is being used has a very strong positive relationship (Table 4) with leaf no with budding and leaf size. Besides height has positive correlation with leaf no and budding. Leaf size has a very poor relationship with flower.

**Table 5. Analysis of numerous measurements from a Spinach compost sample and correlation findings**

|   | Height(inch) | Leaf no. | Leaf Size(inch) | Budding | Flower | Fruit |
| --- | --- | --- | --- | --- | --- | --- |
| Height(inch) | 1.00 |  |  |  |  |  |
| Leaf no. | 0.56 | 1.00 |  |  |  |  |
| Leaf Size(inch) | -0.10 | 0.50 | 1.00 |  |  |  |
| Budding | 0.49 | 0.87 | 0.66 | 1.00 |  |  |
| Flower | 0.19 | 0.54 | 0.11 | 0.44 | 1.00 |  |
| Fruit | 0.98 | 0.58 | -0.17 | 0.49 | 0.24 | 1.00 |

Spinach which used compost has moderate growth with time. Table 5 shows Where height has a strong positive correlation with fruit and very poor negative correlation with leaf size. Budding has a very strong and positive correlation with leaf no. others parameters has very poor and poor correlation.

**Table 6. Analysis of numerous measurements from a Spinach dilution sample and correlation findings**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Height(inch) | Leaf no. | Leaf Size(inch) | Budding | Flower | Fruit |
| Height(inch) | 1 |  |  |  |  |  |
| Leaf no. | 0.98 | 1 |  |  |  |  |
| Leaf Size(inch) | 0.92 | 0.91 | 1 |  |  |  |
| Budding | 0.81 | 0.85 | 0.79 | 1 |  |  |
| Flower | 0.75 | 0.73 | 0.86 | 0.60 | 1 |  |
| Fruit | 0.89 | 0.91 | 0.74 | 0.68 | 0.52 | 1 |

Spinach do not use compost but dilutions has very strong and positive correlation among height, leaf no, leaf size, budding and fruit where flower has positive strong correlation with height (Table 6). Leaf no, leaf size, budding and fruit has very strong positive correlation among them and strong positive correlation with flower. Leaf size has very strong positive with flower and strong positive with fruit and budding correlation. Other parameters have moderate to poor correlation among them.

**Table 7. Analysis of numerous measurements from a spinach blank sample and correlation findings**

|  | Height(inch) | Leaf no.  | Leaf Size(inch) | Budding | Flower | Fruit |
| --- | --- | --- | --- | --- | --- | --- |
| Height(inch) | 1 |  |  |  |  |  |
| Leaf no. | 0.96 | 1 |  |  |  |  |
| Leaf Size(inch) | 0.77 | 0.77 | 1 |  |  |  |
| Budding | 0.74 | 0.86 | 0.50 | 1 |  |  |
| Flower | 0 | 0 | 0 | 0 | 1 |  |
| Fruit | 0 | 0 | 0 | 0 | 0 | 1 |

Table 7 indicates that Spinach do not use any compost or dilution has very strong and positive correlation with leaf no. where height, leaf size, budding has strong and positive correlation among them. Leaf no, leaf size and budding has strong positive correlation among them. Flower and fruit parameters have very poor to poor or no relationship among them considering the time period of data collection.

The microbial biomass is able to rapidly store significant amounts of easily soluble P and to prevent it from adsorption or other fixation processes (Khan & Joergensen, 2009). Organic putrescible wastes were biologically stabilized by composting in an aerated static pile to produce humified organic matter (green compost), which can be applied as a soil conditioner for farming. Here, the effectiveness of the composting technique used as well as the physico-chemical properties of the raw material and the finished product are described. Furthermore, included are some facts on this green compost production's microbiology and phytotoxicology (Vallini & Pera, 1989). The diluted materials (compost at the 25: 75 and vermicompost at the 50: 50 and 25: 75 proportions) produced good-quality plants (Belda et al., 2013). Organic fertilization has been proposed as an alternative method, in the frame of sustainable agriculture, to enhance soil fertility and satisfy the nutritional needs of crops, without the input of chemical fertilizers.

**Laboratory test result (pH, organic C, organic N)**

The compost and dilution were made from the collected organic waste/ kitchen waste from the randomly selected 15 households tested in the laboratory. Compost has a pH of 6.26, which is less acidic than diluting, which has a basic pH of 7.4. pH always can affect the soil structure and plant growth and a range from 5.5 to 7.0 pH is best for plant growth (Ward, 2015). Since both compost and dilution are inherently high quality and have the ideal pH level, they are both helpful for plant growth; nevertheless, compost is more suited than dilution. Again, organic C of compost is 12.27% and dilution is 1.12%. 2-10% organic C is suitable for plant growth. So, the organic C of compost and dilution is comparatively good for the plant. In addition, the organic N of compost is 1.08% and dilution is 0.08% which is also good for plant growth.

The results of the laboratory tests are fairly positive, and no chemicals were employed here; however, a significant amount of garbage was recycled to create the compost and dilution, making this a very beneficial and happily accepted product. It has no negative effects on the environment and aids in waste reduction and recycling as well as agriculture and roof or terrace gardening.

In comparison to using only organic fertilizer, applying a mixture of organic and mineral fertilizer increased yield. The strongest overall predictor/regressor for grain production, total nitrogen yield, and apparent bioavailable nitrogen was typically total mineral N in the fertilizer. In comparison to compost, the use of biogas residue increased yield and grain quality (Svensson et al., 2004). Large levels of heavy metals could be applied together with the compost if a larger application rate is used to make up for the compost's low mineral N concentration (Svensson et al., 2004).

To reduce the risk of N and P losses, nutrient-rich composts are used sparingly; as a result, their effectiveness as soil improvers through C addition and the accumulation of soil organic matter is constrained (Castan et al., 2016).

**Plant Growth Parameter Observation of Plants**

On the other hand, another important thing is found in those two variants. On the same variant compost and dilution has different effect on the plant growth. At the case of chilli plant in C1C First budding in 26th December 2020 and in C1D first budding in 6th February 2021 and in C1B first budding in 26th December 2020 but with a very little in number. Again, C1C First flower blooms in 26th February 2021 and in C1D first flower blooms in 18th April 2021 and in C1B first flower blooms in 8th May 2021. Again, C1C First fruit comes in 18th March 2021 and in C1D first fruit comes in 18th April 2021 and in C1B there is no fruit. At the last day C1C plants height was 40 inches where C1D plants height was 29 inch and C1B plants height was 24 inches. More than 100 fruits come at C1C and more than 45 fruits comes at C1D and there is no fruit comes ate C1B. So, it is clearly seen that compost and dilution both are very good for plants but for chilli plants compost is more effective than the dilution.

At the case of spinach plant in S1C First budding in 6th January 2021 and in S1D first budding in 26th January 2021 and in S1B first budding in 18th April 2021. Again, S1C First flower blooms in 6th February 2021 and in S1D first flower blooms in 8th March 2021 and in S1B there is no flower. Again, S1C First fruit comes in 16th February 2021 and in S1D first fruit comes in 28th March 2021 and in S1B there is no fruit. At the last day S1C plants height was 121.9 inch where S1D plants height was 112 inch and S1B plants height was 16 inch. So, it is clearly seen that compost and dilution both are very good for plants but for creeping plants like spinach compost and dilution is more effective than the normal plants.

4. Conclusion

Waste generation is increasing day by day and reducing or recycling them is getting too hard proportionally. Solid waste management is a growing environmental and financial problem in developing countries like Bangladesh. Despite significant efforts in the last decades, the majority of municipalities in developing countries face difficulties in managing the growing quantity of waste in their cities. Family size has a significant impact on waste production because it contributes to global population growth. Family size and kitchen waste regeneration are strongly correlated, and both the direct and indirect effects on the environment are negative. Family income also has a strong positive correlation with kitchen waste generation. Recycled kitchen waste to compost and dilution is a big option to reduce a huge amount of waste. It has greatly benefitted to domestic agriculture, the environment and human health as well. Effects of compost and dilution on the plant's growth rate show that there has a strong positive correlation between all the parameters of the plants. It's very obvious to the aware general people the fearlessness of increasing waste from the household. Because when general public realizes how bad the situation is, they will work to decrease waste in their contributions. We have to protect our environment for ourselves for our better health, better environment, and most importantly for our clean country. Every dweller has to be responsible for their duty to protect the environment and keep it net and clean besides have to help the Government in every step of managing the waste.

Consent (where ever applicable)

"All authors declare that ‘written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

Ethical approval (where ever applicable)

this article does not contain any studies involving human or animal subjects.

 “All authors hereby declare that "Principles of laboratory animal care" (NIH publication No. 85-23, revised 1985) were followed, as well as specific national laws where applicable. All experiments have been examined and approved by the appropriate ethics committee”

“All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.”

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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