

# Study on domestic kitchen chimney

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**Abstract**—The domestic use of chimney is related to cleaning of the residential area from pollutants available from burning fossil fuels. Now a day's technology is developing and population is increasing day by day and as a result environmental problems are also increasing. So as a design work decided to make a chimney which can help the civilians and also economical for them. This chimney is very useful for common people and it is also use full for home, hotels, restaurant etc. cooking places.

**Key words**—Chimney, fossil fuel, pollutants, cooking.

## I. INTRODUCTION

Globally, more than 2.7 million children under five years of age die annually from diarrhoea and acute lower respiratory tract infections. In India, recent national mortality statistics indicate 14% of deaths in children less than 5 years of age were attributable to acute lower respiratory-tract infections and 12% to diarrhoeal diseases. Several studies demonstrated that simple, efficient and effective interventions at household level including improved sanitation, personal hygiene and improved water supply are cost-beneficial and cost-effective approaches in reducing the diarrhoeal disease burden. A recent systematic review estimated that hand washing with soap reduced diarrhoea by 41% and household water treatment by 15%. This is especially important for populations with access to sufficient quantities of water of inadequate microbiological quality. A further type of intervention that can reduce the burden of childhood disease is the provision of improved chimney stoves. A recent meta-analysis on the impact of household air pollution demonstrated a nearly two fold increase in the odds of suffering from childhood pneumonia if the child was exposed to smoke from incomplete combustion of household fuels. Changing from open fires to improved ventilated stoves has been demonstrated to improve indoor air quality and reduce severe acute lower respiratory infections among infants. Though

single interventions can bring benefits, a package can bring greater advantages because of synergistic effects. An integrated package of home-based health interventions on priority child diseases will enhance health gains through synergistic effects. Synergy effects can be expected because children infected with one infectious disease become more susceptible to other diseases and multiple interventions are able to interrupt multiple transmission cycles at the same time. Furthermore, interventions addressing several health hazards simultaneously are more likely to address the caretakers' perceived benefits leading to more sustainable compliance. Finally, the associated costs, especially management costs, are lower if multiple interventions are being implemented jointly. However, interventions can only bring real benefit if they are sustainable. This will only be the case if the interventions are culturally acceptable to the beneficiaries, and they need to be involved in planning and implementation.

Modular kitchen, a significant development in the world of kitchen has worked tremendously in bringing down the common problems of a kitchen. It is an intelligent approach towards positioning the key kitchen appliances in a systematic manner to avoid unnecessary wastage of time and effort. Very convincingly it has entered the premises of today's homes to never leave. Modular kitchens are not only aesthetic but also quite practical and handy, especially for the contemporary families. Decorating the modular kitchen will no longer be a difficult and time consuming task. The Concept and the ethics we run by is to deliver a product for the masses. Kitchens to be installed in homes of not only the high segment customers but also the middle class and the average customers. India has a diverse population and most of the people live on rent or below to middle segment group.

## II. WORKING OF CHINMNEY

A kitchen chimney is the best aid to remove smoke, grease, odor, stains, accumulation of oil droplets, etc. from your kitchen. It also helps in keeping your kitchen ventilated. Nevertheless, to find the best one is difficult. But don't worry for you we have made a list of the best kitchen chimneys available in the market. We have dealt with each product in detail to help you choose the one that fits your need and space. The chimney has a beautiful sleek shining stainless steel body to match every kitchen decor. It is analyzed that it won't occupy much horizontal space on the ceiling. It is equipped with a high-efficiency grease filtration system. It is also tested and found that it can effectively remove oil droplets, grease, stain dust, fume, smoke, etc. The extraction rate or the suction power is 800 cubic meter. This is excellent to remove all the microscopic particles from the surroundings which further ensure that your kitchen has great air quality. It is suggested that it can fit any kitchen space easily especially the Indian kitchen as shown in Fig. 1. Lastly, the other superb feature is the energy-efficient halogen lighting. It is present on the downward side of the chimney to keep your entire kitchen top well lit. So, with this, your kitchen will not have good ventilation but also it would be well-lit. The package included the development and evaluation of an improved ventilated cooking stove together with a kitchen sink, the promotion of a home-based drinking water treatment technique combined with hand washing and hygiene education. Potential beneficiaries were consulted about their needs and preferences before the project started, and asked about their perceptions of the project after a year of implementation. The following area the points considered before selecting a chimney.

- Chimney filter types
- Types kitchen chimney
- Chimney suction power
- Chimney size
- Chimney design
- Chimney ducting



Fig. 1. Chimney installation.

Depending on the material, structure and filtering process, chimney filter types are classified into 3 categories.

- Cassette/Mesh Filter
- Baffle Filter
- Carbon Filter

Usually, the filters have multiple layers of aluminium or stainless steel mesh filters to trap the solid particles while allowing the smoke to escape. However, these filters require high maintenance. In addition, they can reduce the suction capacity of the filters because of the blockages. The best way is to wash the filters regularly either by yourself or getting it done from someone. Most of the Indian chimneys have the baffle filters. This is in fact, an improvement on the aluminium wire mesh filters. In some of the chimneys, these filters are paired up with the charcoal filters. The charcoal ones are used for odour absorption. The filters work well with both ducted or ductless chimneys. The heavy greasy, spicy, and oily particles get absorbed by the charcoal or carbon granules. So, they offer two-way process of odour removal and absorption of unwanted residues. Research says that these filters are about 30% better than the mesh filters.

The design involves the panels on the filter to have multiple curves that allows the smoke to escape freely while restraining the grease from doing so. It is comparatively easier to maintain a baffle filter because they require cleaning once in around 3 to 4 months. Nowadays, you have the detachable baffle filter whereby you can do so at home and clean it thoroughly. You do not need a technician to do so. What type kitchen chimney are you going to buy

decision depends on the structure of your kitchen and where are you planning to fit it, the location of the cooking platform, hob, stove. Based on the capabilities where you can fit, a kitchen chimney can be divided into 4 categories.

- Wall mounted chimney
- Island chimney
- Built-in chimney (Integrated)
- Corner chimney (Rare in India)

The conventional chimneys are available in ducted and ductless variants. Built in chimneys are integrated into the cabinetry above the cook-top. They remain hidden from view and blend in seamlessly with the decoration of the kitchen. The island chimney secured to the ceiling and hang freely over the cooking platform for western kitchen. Wall mounted chimney are the commonest kind of domestic chimney mound on wall the kitchen hood positions. The different functions of chimney include:

- Smoke and oil droplets emitted during the cooking process are drawing in to chimney to exhaust it into the outside environment.
- A kitchen chimney is a contraption that vents, smoke, moisture and grease filled air.
- Kitchen clean and prevents breathing problem.
- They need to be removed through chimney, exhaust fans, window and ventilators.
- Indian cooking entrains plenty of frying and sautéing.
- The recycled air is then released back into the house and not expelled like in a ducted chimney.

The chimney suction power is directly proportional to the chimney’s ability to clean the air. It should recycle the air at a rate of ten times per hour. Higher the suction power higher the rate of the chimney to clean the unwanted particles or gases from the air.

The generalized specifications of chimney are given in the following table 1.

Table 1. Specifications of a chimney

Draft Angle (°)	Inlet area (mm <sup>2</sup> )	Outlet area (mm <sup>2</sup> )	Height (mm)
Flat	354.72	64.51	1143
35	354.72	54.98	1143
40	354.72	87.68	1143
45	354.72	118.50	1143

### III. FUTURE PROSPECTUS

India kitchen hoods market stood at \$ 132 million in 2019 and is projected to grow at a CAGR of over 15%, to reach \$ 313 by 2023 as shown in Fig. 2. Growth in the market is led by rising urbanization, increasing inclination of young population towards western world preferences and growing disposable income in the country. Moreover, technological advancements in kitchen appliances coupled with increasing preference towards modular kitchens for efficient space utilization is further expected to drive India kitchen hoods market through 2023.

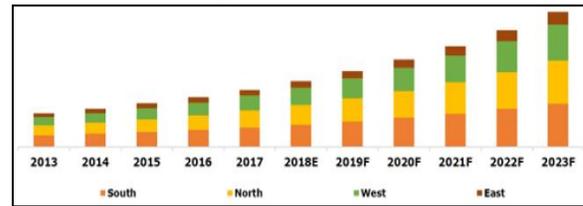


Fig. 2. Indian kitchen hood market rise.

### V. CONCLUSIONS

An excellent kitchen chimney is required in all the kitchens, especially for Indian cooking as it requires a long cooking time and more usage of spices and oil. You often feel irritated with smoke in your kitchen and greasiness effective the space and the things around the kitchen. To solve this issue the best option is investing in the best kitchen chimney. Selecting a best kitchen chimney brand in India requires a lot of research and testing as India is still developing in this term. So, what you need to do is go through general guide list down your requirements and then grab the one that fits you. Be rest assured that all the kitchen chimney listed above are performance wise great and safe to use so you can select any one of them.

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