**Cooking fuel transitions and its importance in India**

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**Abstract**

Cooking fuels transition is more important part of the sustainable development. The fuels transition from traditional biomass to clean cooking fuels secured better health for women and children and over all improves the standard of living of people in developing countries. The solid fuels use for cooking in households leads to household air pollution and harmful impacts on health. Still most of the developing countries use traditional solid fuels even increasing awareness and revolution on use of clean sources of energy for cook which is harmful to both the environment and human health. In India, household air pollution which occurs from burning solid fuels is a significant contributor to the total disease burden, approximately 6, 00, 000 deaths in 2019. It is 68% of population access clean cooking fuels in India where 91% in urban and only 54% in rural. The present paper attempted to find out the transition of cooking fuels and government policies initiatives to improve the use of clean fuels in India.

**Key Words:** Cooking fuels, Sustainable development, Solid fuels, Developing, Environment, Health.

**I. Introduction**

Cooking fuels transition means the accessing clean sources of fuels ignoring the traditional biomass. Clean energy has the most important role in economic, social and sustainable growth. The uses of clean cooking fuels secured better health for women and children and over all improve the standard of living of people in developing countries. Burning of solid fuels to prepare food on simple cook stoves in households with poor ventilation leads to household air pollution and harmful impacts on health (CEEW, 2020). Despite increasing awareness and revolution on use of clean sources of energy for cook, most of households in developing countries continue to use solid fuels, which is harmful to both the environment and human health. Around 3 billion people, mostly in low and middle-income countries, lacked access to clean energy services for cooking resulting nearly 4.3 million premature deaths worldwide (WHO, 2012). Energy is at the heart of many of Sustainable Development Goals (SDGs) considering the expansion of accessing electricity, improvement of clean cooking fuels and restrain deadly air pollution which prematurely kills million every year around the world. Clean cooking is one of the target of SDG 7 where target 7.1 comprise of two targets i.e., 7.1.1 access to electricity and 7.1.2 access to clean cooking fuels. The global population without access to clean cooking remained largely unchanged since 2010 to 2018, standing at close to 3 billion (Tracking SDG7, 2020).

In India, household air pollution which occurs from burning solid fuels is a significant contributor to the total disease burden, accounting for nearly 600,000 deaths in 2019 (CEEW, 2021). Around 69% of global population access clean cooking fuels where 86% in urban and 48% in rural area (WHO, 2021). In India 68% of population access clean cooking fuels and it is 91% in urban and only 54% in rural.

**II. Transition of cooking fuels in India**

 Generally if we observed that cooking fuels transition have taken place in India but it was very slow in past period. Rapid transitions have taken place from launching of Pradhan Mantri Ujjawal Yojana (PMUY) in 2016. The following table 1 show households percentage that the primary sources of energy used for cooking all India from 1993-94 to 2021

**Table 1: Primary source of energy used for cooking all India from 1993-94 to 2020-21**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | coke/ coal | firewood & chips | LPG | dung cake | kerosene | no cooking | Other | Total |
| Rural |
| 1993-94 | 1.4 | 78.2 | 1.9 | 11.5 | 2.0 | 0.7 | 4.1 | 100 |
| 1999-2000 | 1.5 | 75.5 | 5.4 | 10.6 | 2.7 | 1.1 | 3.1 | 100 |
| 2004-05 | 0.8 | 75.0 | 8.6 | 9.1 | 1.3 | 1.3 | 3.8 | 100 |
| 2009-10 | 0.8 | 76.3 | 11.5 | 6.3 | 0.8 | 1.6 | 2.7 | 100 |
| 2011-12 | - | 60 | 15 | 10 | 9 | 1 | 15 | 100 |
| 2018 |  | 44.5 | 48.3 | 5.5 | - | 0.6 | 1.1 | 100 |
| 2020-21 | 0.3 | 46.7 | 49.4 | 3.0 | 0.1 | 0.2 | 0.3 | 100 |
| Urban |
| 1993-94 | 5.7 | 29.9 | 29.6 | 2.4 | 23.2 | 6.3 | 3.0 | 100 |
| 1999-2000 | 4.1 | 22.3 | 44.2 | 2.1 | 21.7 | 4.3 | 1.3 | 100 |
| 2004-05 | 2.8 | 21.7 | 57.1 | 1.7 | 10.2 | 4.9 | 1.6 | 100 |
| 2009-10 | 2.3 | 17.5 | 64.5 | 1.3 | 6.5 | 6.5 | 1.5 | 100 |
| 2011-12 | - | 14 | 68 | 1 | 6 | 7 | 4 | 100 |
| 2018 | - | 5.6 | 86.6 | 0.5 | - | 4.1 | 3.2 | 100 |
| 2020-21 | 0.5 | 6.5 | 89.0 | 0.3 | 0.5 | 1.7 | 1.5 | 100 |

**Sources: NSSO 66th, NSSO 68th (2011-12), NSSO 76th (2018) and NSS 78th (2020-21)**

Table 1 revealed that transition of fuels is faster in urban area compare with rural area. The clean fuel (LPG), only 1.9 percent of rural households used as a primary source of cooking energy in 1993-94 and it became 49.4 percent in 2020-21. In urban area, it was 29.9 percent in 1993-94 and then 89 percent in 2020-21.

**Figure 1: Transition fuels use in Rural India from 1993-94 to 2020-21**

**Source: Sources: NSSO 66th (2009-10), NSSO 68th (2011-12), NSSO 76th (2018) and NSS 78th (2020-21)**

The above figure 1 show the simple trend line primary cooking fuels used by the rural households all India from 1993-94 to 2020-21. It is observed that only two sources of energy are main i.e. LPG and firewood that are approaching each other. The LPG is increasing and firewood is decreasing. It is also found that all other sources of energy used for cooking by the households are decreasing; some of them increase till 2012 but they start declining from 2012. It is cleared that cooking transition has taken in India since the primary use of clean cooking fuels increase in every decade.

The figure 2 indicate that the urban households use primary sources of energy used for cooking all India from 1993-94 to 2020-21. It is revealed that the used LPG is increasing very rapidly but other sources of energy are declining. Firewood & chips was already 29.9 percent in 1993-94 and it became only 6.5 percent. The LPG was 29.6 percent in 1993-94 and 89 percent in 2020-21. So it is observed that transition of clean cooking fuels is faster in urban area compare with rural area.

**Figure 2: Transition fuels use in urban India from 1993-94 to 2020-21**

**Source: Sources: NSSO 66th (2009-10), NSSO 68th (2011-12), NSSO 76th (2018) and NSS 78th (2020-21)**

The figure 3 indicate that the rate of households access different sources of cooking energy in 2020. LPG is accessed by 85 percent of households and 5 percent electricity and firewood (49.4%), crop residue (15.4%), dunk cake (23.70%), and others (13%).

**Source: IRES, 2020**

The figure 4 indicates the rate households use primary sources of energy for cooking all India in 2020-21. The 62 percent of households use LPG as primary source of energy for cooking and firewood, chips & crop residue (33.8%), other natural gas (0.5%), dunk cake (2.2%), kerosene (0.2%), coke/coal (0.4%), gobar gas (0.1%), electricity (0.1%) and no cooking (0.7%). It is found that only 62.6 percent (LPG, electricity and other natural gases) of households are using clean fuel as the primary source of energy for cooking. Observing the both figures 3 and 4, 90 percent of household are assessing clean fuels for cooking ( LPG 85% and 5% electricity) but only 62.3 percent are use clean fuels as their primary for cooking. So the rate of households accessed to clean fuel is significant but primary use it for cooking is insignificant.

**Source: NSS 78th round (2020-21)**

**III. Trend of rate of population access to clean cooking fuels in India**

Throughout this paper we have found transition cooking fuels all o India from 1993-94. Now we can analyse trend of rate of population access to clean cooking fuels in India. The World Bank has given the information that the different nations access to clean cooking fuels and technology basis of population. The figure 3 show the simple trend line that the percentage of population access to clean cooking fuels in India. It revealed that the percentage of urban population is more than the rural and overall that access the clean fuels over the different period. The Indian 22% of population access clean cooking fuels in 2000, then increases to 68 % in 2020. While, in rural, area it was only 7% and 50% in urban area in 2000. In 2020, it became 54% in rural and 91% in urban area.

**Figure 5: Rate of Population access to Clean Cooking fuels in India**

**Source: World Bank** <https://data.worldbank.org/indicator/EG.CFT.ACCS.ZS>

**IV. Indian Government Policies to improve clean cooking fuels**

Throughout this paper, we found that poor access to clean cooking fuels in rural areas of India in the earlier period. To improve this poor access to clean cooking fuels, the government of India has introduced various programmes about LPG to make it accessible and affordable for low-income families. DBTL (direct benefit transfer for LPG) was launched on 1st June, 2013, initially in 291 districts and later it is expanded throughout the country to provide direct subsidy that can be reached to beneficiaries’ bank account (Ministry of Petroleum and Natural Gas, Government of India). The main objectives of this programme are to remove subsidy diversion and clear out the fake connections.

 The ‘Give It Up campaign’ was launched on 27 March, 2013 and it urges middle-class families to abandon their LPG subsidy so that it could be transferred to low-income families. Since the campaign’s launch, about 1.13 crore people have left their subsidies.

 In the year 2016, Pradhan Mantri Ujjawal Yojana (PMUY) was introduced with an aim to provide LPG connection against a female member of a below poverty level (BPL) family. To empower women and protect them from the health risks caused by solid fuel use was the main objectives of the scheme. Under this world larges clean cooking energy programme more than 80 million Indian household had benefited between 2016 and 2019. As per 76th round of NSSO, 48% rural household are using LPG in India. While North-East Indians hardly use LPG for cooking, eastern states like Jharkhand (21.5%), West Bengal (24.5%), and Odisha (23.8%) have shallow coverage. In north India like Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh have increased LPG connection under PMUY scheme (CWWE, 2020).

In India, Piped Natural Gas is a cheaper option than LPG. According to the data published by the Petroleum Planning and Analysis Cell (PPAC) 8,217,913 connections were provided in the country on September 2021. However, around 29 crore households, there is still a so far way to go, to create infrastructure for providing natural gas through pipes for domestic cooking.

In February 2021, the Union ministry of power launched the “Go Electric” Campaign intending to create awareness among the masses about the benefits of switching over to electrical cooking using appliances such as induction cooktops, electric pressure cookers, etc.

**V. Conclusion**

Accessing clean cooking fuel is one of indicator of SDG 7 that universal access by 2030. Given the current status of adoption of clean cooking across the developing world, the target of achieving the UN Sustainable Development Goal (SDG) for universal access to clean cooking by 2030 does not appear to be on track. Its will depend different factors including large-scale investments, participation of all stakeholders, and vigorous policy support mechanism. It has been estimated that to increase access to clean cooking services globally on a large scale, investment needs are in the range of $4.4 billion annually (Sinha, 2022).In India most of the household use traditional solid fuels in cooking even they have LPG, which impact on environmental, economic, and personal health problems that affect women and children disproportionately. Thus effort should be given require replacing traditional solid fuels with more energy-efficient cooking solutions to reduce smoke emissions, time needed to procure fuel, and time spent cooking. Most of rural women are illiterate and they don’t about adverse effect of solid fuels that so government and local agency should be given priority on women education and awareness programme on clean cooking fuels.

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