

Electric Cooking Outreach (ECO) Follow-up Study



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EXECUTIVE SUMMARY

This study was supported by UK Aid and Loughborough University under Modern Energy Cooking Services (MECS) programme. This is a follow-up study for the pilot study entitled “Testing electric cooker adoption in the socio-economic and cultural context of Nepal”, carried out under the MECS ECO project. The focus of this study is on whether eCooking practices have changed (e.g. amount/type of use/additional device bought or interest to do so) among the ECO participants. The study also examined the impact of the introduction of eCooking appliances into the community on households that were not ECO participants. Women Awareness Center Nepal (WACN) carried out this study in the same Saving and Credit Co-operatives of the ECO project - Sahara Nari Chetna Skill Cooperative, Banepa (urban) and Sabal Nari Chetna Agriculture Cooperative, Timal (rural). The approach of the study was as follows:

- Collect data on the cooking practices of 10 ECO participants, 5 each from the rural and urban locations, using an intensive cooking diary for two weeks;
- Interviews of 15 rural and 15 urban ECO participants using a structured questionnaire that includes an indicative cooking diary;
- Interviews of 25 rural and 25 urban non-participant households from the community using a structured questionnaire;
- Analysis of ECO follow-up cooking diary data, interviews of ECO participants and non-participants, Cooking diary data of the ECO project, and Exit interviews of the ECO project;

Main findings:

- The share of electricity in total cooking/heating events has increased in rural and urban households. Compared to the Endline phase, in the follow-up phase electricity share in cooking events has increased from 41% to 47% in rural households and 42% to 53 % in urban households.
- Use of EPC for cooking has declined in the follow-up phase as compared to the endline phase- in the rural households EPC share in cooking events came down to 36.2% from 38.8% and in urban households, it came down to 26.6% from 32.5%. There is an increase in the use of induction cooktops for heating events in the follow-up as compared to Endline phase – the share of induction in cooking events increased to 10.8% from 0.4% in rural households and in urban households increased to 14.8% from 2.3%.
- Compared to the Endline phase, LPG share in cooking events had further declined in the follow-up, it came down to 39.2% from 49.9% in rural households and 44.3% from 55.7% in urban households. A 10% fall in LPG share in total cooking events is visible, both in rural and urban households.

- Rice and pulses, which is also the staple dish in Nepal, appear to be the most preferred dish to be cooked in EPC, both in rural and urban households.
- There has been no significant shift in cooking responsibility among females and males, females remain the main cook of the household. The follow-up cooking diary suggests that in urban households' male members cook mainly on electricity.
- LPG stoves are the most widely available and used cooking devices in non-participant households.
- There is high acceptability of eCooking in terms of ease of cooking, cheap running cost, safe cooking, and taste of food in the community.
- 44% of non-participants agreed that their opinion of eCooking has changed since the ECO project started and 42% of non-participants have become more positive about eCooking.
- 98% of non-participants expressed their willingness to buy EPC and 6% of them are willing to buy induction. The benefits of cooking explained by the ECO participants may have positively changed their opinion about buying it.
- High upfront capital cost, unavailability of quality eCooking appliances in the local market, and lack of awareness or information about suppliers of eCooking appliances are some of the main reasons non-participants for not buy eCooking appliances.
- High upfront cost of eCooking appliance, lack of credit support, and poor supply chain seem to be the major challenges for the adoption of electric cooking both for participants and non-participants.
- The ECO program has had a long-term impact on improving the eCooking awareness level not only for participants but also in the local community. To outscale eCooking to other communities, it becomes important to carry out more awareness campaigns and demonstration workshops for new communities. Simultaneously, it becomes important to devise a policy for providing quality products at affordable prices. Improving the supply chain for eCooking in small cities and towns will boost consumer confidence in eCooking appliances.
- Increasing and sustained use of eCooking devices by participants in ECO and Follow up study suggests that Saving and Credit Co-operatives (SACCOs) network can serve as a launch pad to 'out scale' eCooking in Nepal. Being a financial institution SACCOs can also provide credit support to its members to overcome the problem of upfront cost of eCooking devices. This approach could be implemented in large number of SACCOs to accelerate the transition to eCooking in the country.

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LIST OF ABBREVIATIONS

CBS	Central Bureau of Statistics
ECO	Electric Cooking Outreach
EPC	Electric Pressure Cooker
GHG	Greenhouse Gas
GoN	Government of Nepal
IRADe	Integrated Research and Action for Development
LPG	Liquified Petroleum Gas
MECS	Modern Energy Cooking Services
NGOs	Non-governmental organizations
SACCOs	Savings and Credit Cooperative Societies
WACN	Women Awareness Center Nepal



1. INTRODUCTION

Nepal has a rich hydropower potential and has made successful strides in electricity access over the last decade. Policymakers are increasingly focussing on utilising this potential to provide clean cooking access through electric cooking (eCooking). A switch to eCooking has several positive impacts such as reduced greenhouse gas (GHG) emissions, indoor air pollution, and improvement in cooking energy efficiency. Additionally, the programme to promote eCooking instead of LPG can be helpful for minimising the growing trade deficit. Imported LPG and fuel wood are the two primary cooking fuels for Nepalese households. In the recent past uptake of LPG has increased even though two-thirds of households still rely on traditional fuel wood for routine cooking (CBS 2017).

A pilot study carried out by IRADe –WACN consortium as part of the MECS Electric Cooking Outreach (ECO) challenge fund in Nepal demonstrated that households provided with eCooking devices (Electric Pressure Cooker- EPC), cook a significant proportion of their menu on electricity on a sustained basis during the study period (IRADe-WACN, 2022)¹. The data captured using MECS intensive cooking diary also depicted a decline in the use of LPG replaced by eCooking. The present follow-up study would further enhance the findings from the previous study and also assesses the impact of the ECO project on cooking practices in the communities over a longer timeframe.

This follow-up study focuses to understand whether eCooking practices have changed among the ECO participants. Importantly, examine the impact of the introduction of eCooking appliances into the community including the households that were not ECO participants. The research concentrates on understanding non-participant views of eCooking and whether the pilot study has led to greater awareness of eCooking in order to inform the potential opportunities for further local uptake. Through engaging both ECO participants and non-participants, the study uses to identify means for the pilots to serve as a launchpad to ‘out scale’ eCooking in the community and its surroundings. The prioritisation of out scaling is based on the assumption that community word-of-mouth can be a far more effective awareness raising mechanism than interventions by external actors, and can act as a powerful driving force for creating community confidence in eCooking and additional demand (Brown et.al 2017); dynamics which were evident during the ECO pilot studies. The broad objectives of the study are as follows:

- Identify the impacts of introducing Electric Pressure Cookers on the cooking practices of the participant and non-participant households of the community;

¹ <https://mecs.org.uk/publications/testing-electric-pressure-cooker-adoption-in-socio-economic-and-cultural-context-of-nepal/>

- Suggest ways to use the understanding and acceptance from the previous ECO pilot study in serving as launch pads to out-scale eCooking in the neighbouring regions and communities.

The follow-up study understands how much cooking needs are met by the EPCs and if there are any challenges faced by ECO participants over time. This will provide a base for future planning, policies, and sustainably unlock out scaling potential of eCooking in many other communities in Nepal. The study activities will ensure increased community awareness by disseminating the device's acceptance and focusing on inter-community learning on e-cooking.

2. METHODOLOGY

A total of 90 households (40 ECO participants + 50 non participants) from Kavrepalanchok district, Nepal, participated in this follow-up study. These households are members of two SACCOs (i) Sahara Nari Chetna Skill Cooperative, an urban women's community in Banepa municipality, and (ii) Sabal Nari Chetna Agriculture Cooperative, a rural women community in Timal rural municipality promoted by Nari Chetana Kendra Nepal (Women Awareness Center Nepal),

With the support from the respective SACCOs officials, a meeting was called at Banepa and Timal, respectively for member households. Participants included both ECO participants and non-participants' households. These meetings at both locations were attended by more than 50 member households, SACCOs officials and the WACN research team members. Participants were given a thorough briefing about the newly commissioned study (ECO follow-up) scope and objective by the WACN research team. In the end, participants were requested to express their voluntary willingness to participate in the study. A list was prepared for members who voluntarily express their willingness to participate and from the list, 20 ECO participants and 25 non-participants were randomly selected at both locations. Based on familiarity with the localized version of the MECS intensive eCooking diary approach (with Nepalese translation), 10 participant households - 5 households from each location were selected to fill intensive cooking diary for 2 weeks.

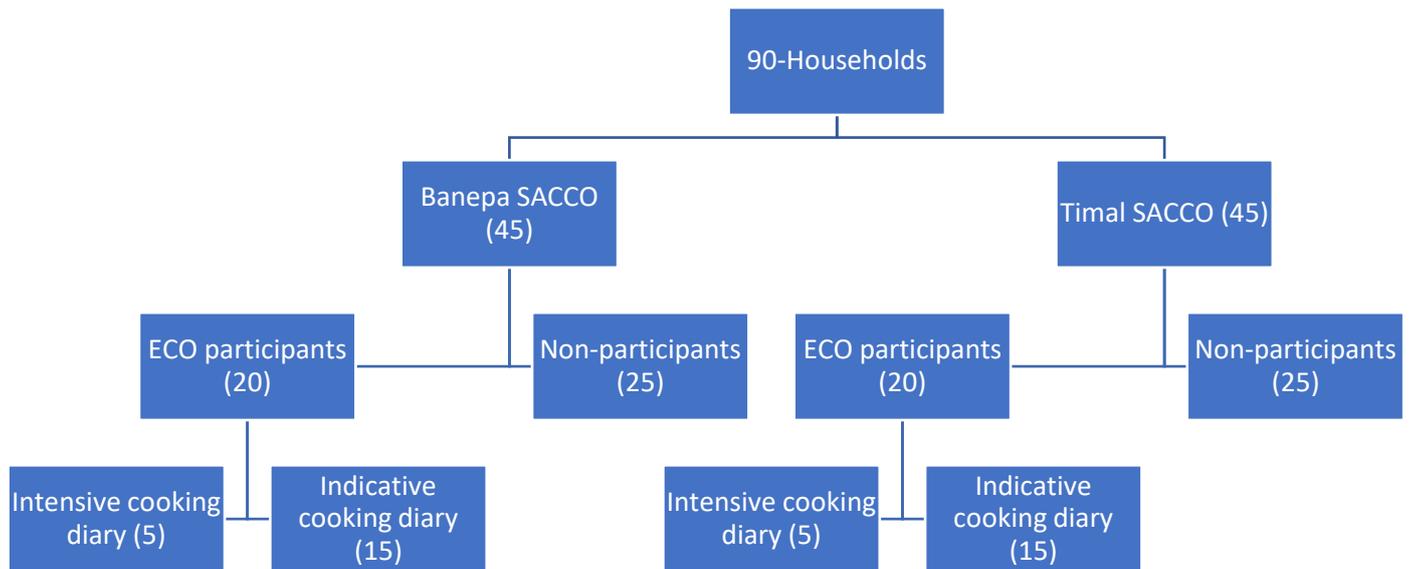


Figure 1: Household selection for data collection

Data from the selected households were collected using a translated (Nepali) version of the questionnaire template developed by MECS (separately for both ECO participants and non-participant households) to suit the local context. One-on-one interviews were conducted with 30 ECO participants and 50 non-participants from the community using a list of pre-prepared questions.

Participant households were reached out for conducting one-on-one interviews. Cooking diary data collection and interviews were initially conducted using a printed questionnaire. The cooking diary quantitative data for participant and non-participant interviews were analysed using descriptive tables, charts, etc. These analyses were further strengthened by drawing from qualitative data and experience gained during the research work. Previous ECO pilot projects, conducted by IRADe-WACN, cooking diary data, and exit interviews were also utilised for this study.



Conducting in-person interviews with the study's participant

3. RESULTS AND DISCUSSION

This section presents the results and findings for the ECO participants based on the cooking diary results of 10 participants (5 urban + 5 rural), interviews of 30 ECO participants (15 urban + 15 rural) and interviews of 50 non-participants (30 urban + 30 rural). The intensive cooking diary data collected for the ECO follow-up study is the same as the ECO study. However, in this study, we have collected only 2 weeks of cooking details and from only 10 participants.

a. Long-term impacts of the ECO pilot studies on community cooking practices for ECO participants administered through an intensive cooking diary approach

I. ECO PARTICIPANTS

- Are ECO participants still using the eCooking appliances provided? Are they using them more/less and why? Have there been any changes in how the appliances are being used (e.g., type of dishes/meals cooked)? How has the cooking fuel stack changed (including % of dishes cooked per fuel)?

The use of electricity for cooking is gradually increasing in both rural and urban areas. A comparison of the endline phase of the ECO study and the follow-up study shows that electricity share in cooking events has increased from 41% to 47% in rural households and 42% to 53% in urban households (Figures 2 & 3).

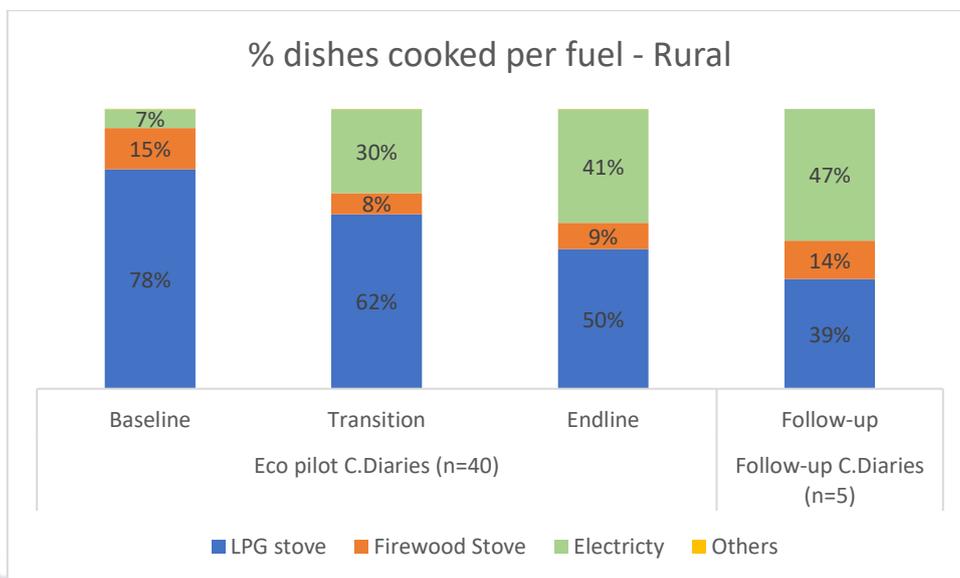


Figure 2: Dishes cooked using different fuel types in rural location

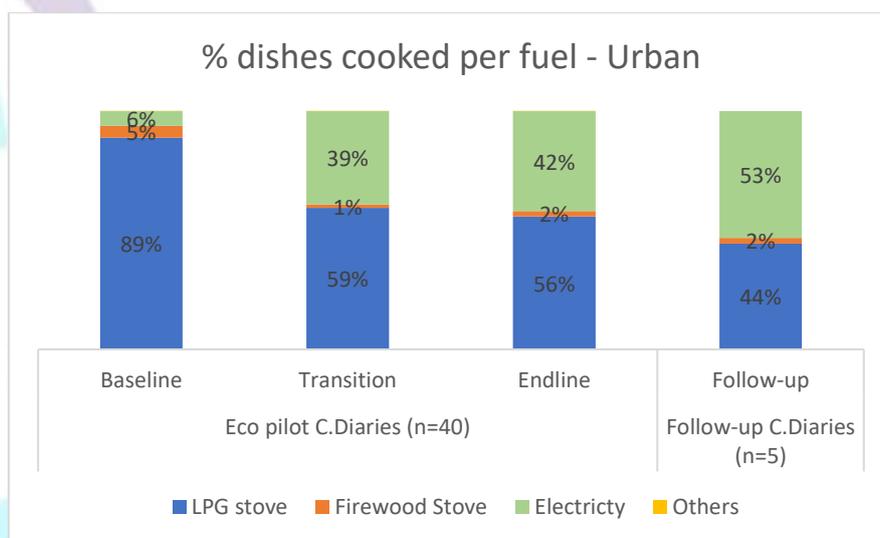


Figure 3: Dishes cooked using different fuel types in urban location

ECO pilot demonstrations have a positive impact on the usage of a suite eCooking appliances by households. It seems ECO participants have learned the advantage of electricity for cooking, which has led to its increased share in the total cooking events. The induction cooktop and electric kettle are the other two eCooking appliances used by households (Figures 4 & 5). The share of LPG in total cooking events had further decreased in both rural and urban households. Firewood share in total cooking events had increased slightly compared to the Endline phase, but this may be due to seasonal impact, as follow-up data were collected during winter season. The use of eCooking appliances in urban communities is higher than in their rural counterparts. Figure 4 depicts that the usage of EPC for cooking events by rural households has decreased slightly from endline to follow-up study from 38.8% to 36.2%.

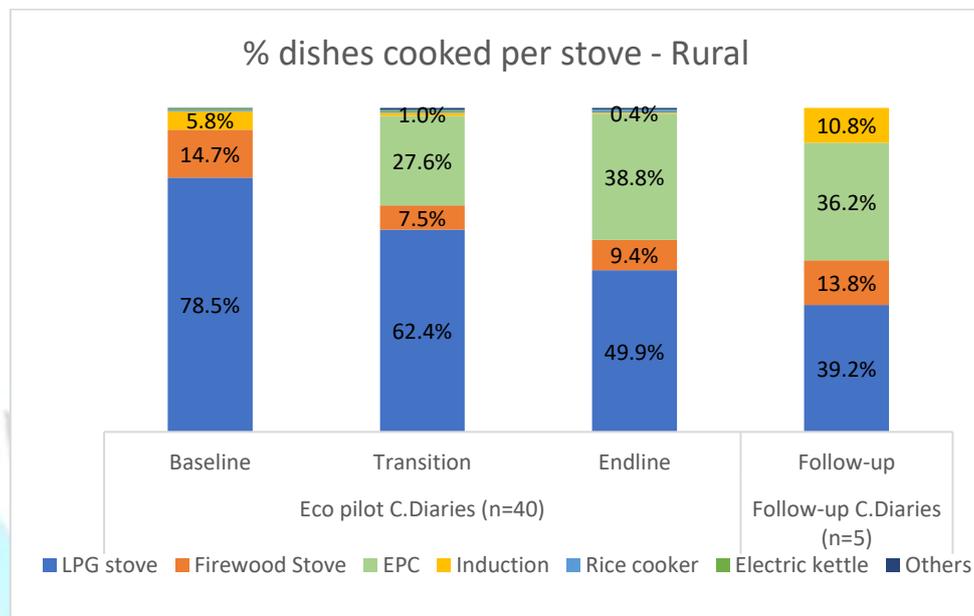


Figure 4: Dishes cooked using different stoves in rural ECO participant households

Figure 5, shows the urban household cooking appliance choices. Similar to rural households, the use of induction cooktop and electric kettles for cooking events has increased significantly in urban households. Share of EPC in total cooking events has decreased and taken over by other eCooking appliances.

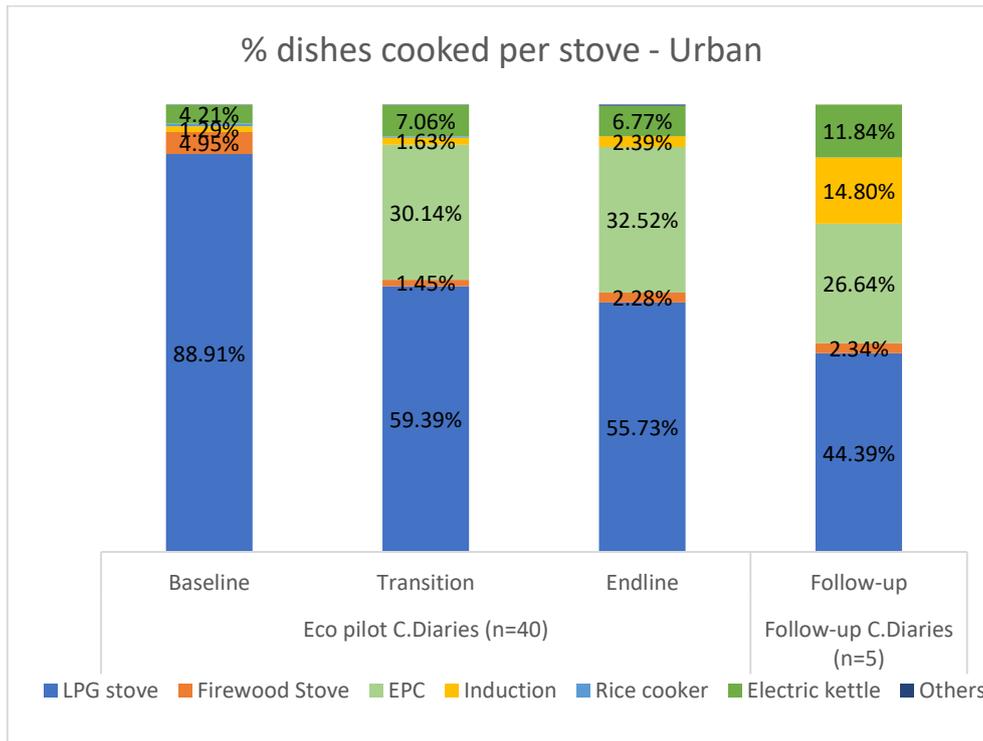


Figure 5: Dishes cooked using different stoves in urban ECO participant households

By comparing the two sets of data above in Figures 2 to 5, we can say that the impacts of the project have increased the usage of electricity as a cooking fuel by both rural and urban communities using different eCooking appliances. The figures show sustained long-term usage of eCooking as the proportion of dishes cooked on electricity increased slightly between the endline phase and the follow-up survey. The overall fuel stack is also cleaner due to increased eCooking.

An analysis of cooking fuel used by ECO participants (30) administered indicative cooking diary shows that the average number of per household cooking events in urban households is higher than in rural households (table 1). It shows LPG and electricity are the two primary cooking fuel choices even though some households do use firewood.

Table 1: Total number of dishes cooked on each fuel for ECO participants administered indicative cooking diary

Cooking device	Total no of dishes cooked on the stove (Rural)	% of total dishes (Rural)	Total no of dishes cooked on the stove (Urban)	% of total dishes (Urban)
LPG	67	57%	112	57%
Wood	1	1%	11	6%
Electricity	50	42%	75	38%
TOTAL	118	100%	198	100%

Figure 6 shows the share of different fuel types for cooking events by the households. The share of LPG in total cooking events performed by rural and urban households is the same but the share of electricity is relatively high in rural households than in urban households' total cooking events. The details of cooking for the indicative cooking diary were memory based and therefore we need to be cautious while comparing it with the cooking diary approach.

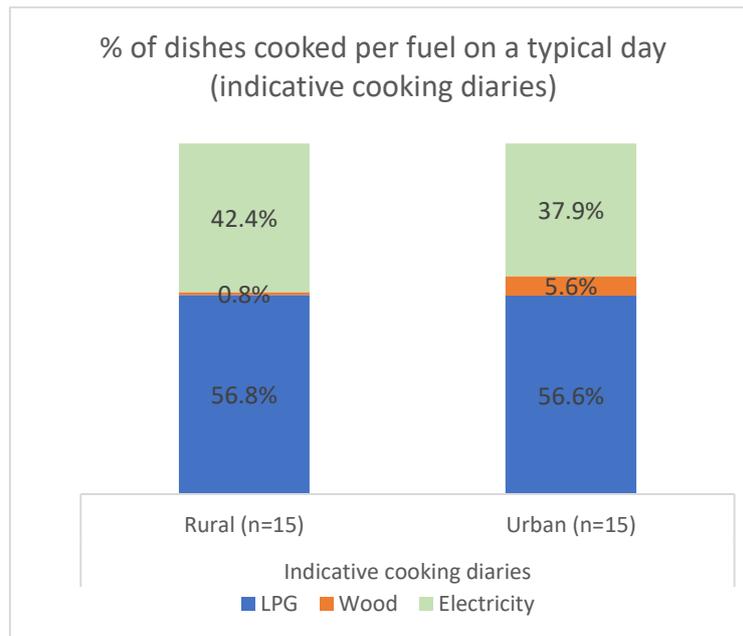


Figure 6: Dishes cooked using different fuel types- indicative cooking diary ECO participants

The data from the indicative cooking diaries is compared with the follow-up studies cooking diaries in figure 7. The cooking diaries data is more precise with a small sample size while the indicative cooking diaries study has a larger sample. Together it gives a broader indication of eCooking use and the fuel stack in the community. eCooking use is greater in the cooking diaries than in the indicative cooking diaries in both urban and rural communities. This suggests that there is significant uptake of eCooking more broadly across the ECO participants.

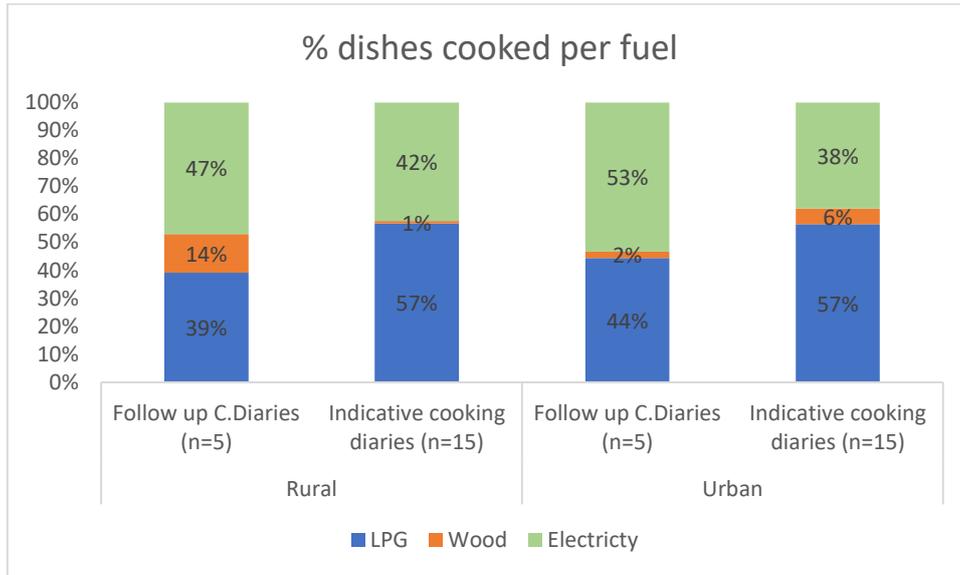


Figure 7: Dishes cooked using different fuel types- comparison between intensive and indicative cooking diary approach

Further, the above analysis is extended for appliance type in figure 8. The appliance type usage analysis shows higher usage of induction and electric kettles for cooking events in both locations for households administered intensive cooking diary than indicative cooking diary. Purpose-specific appliance (electric kettle) is used mostly in urban communities.

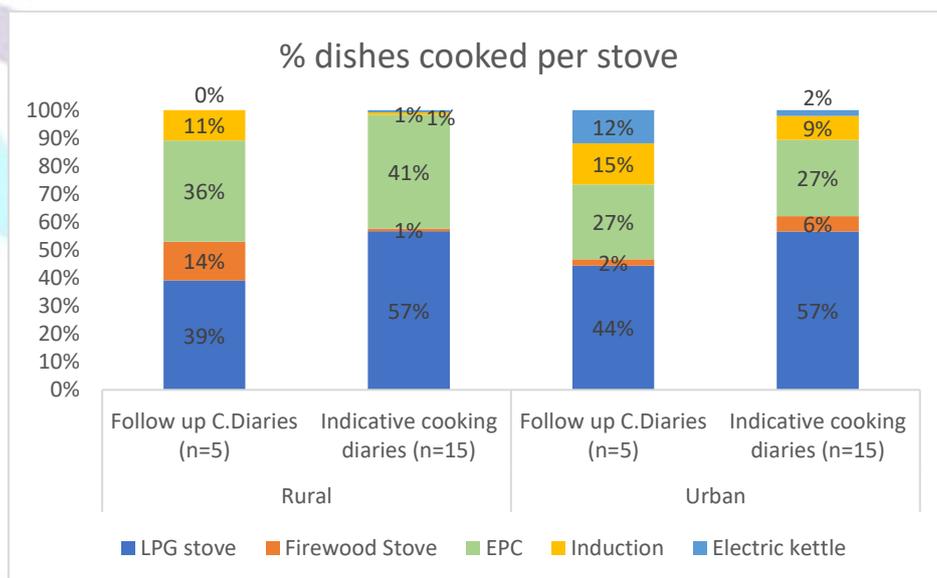


Figure 8: Dishes cooked using different stoves- comparison between intensive and indicative cooking diary approach

A dish-level analysis for the use of EPC suggests that usage of EPC has increased for cooking meat,

pulse, and vegetables in the rural communities in the follow-up study than endline phase. Whereas for rice preparation usage of EPC has reduced (figure 9). In contrast, the rural households for the urban household usage of EPC increased only for rice preparation in follow-up study than in the endline phase (figure 10).

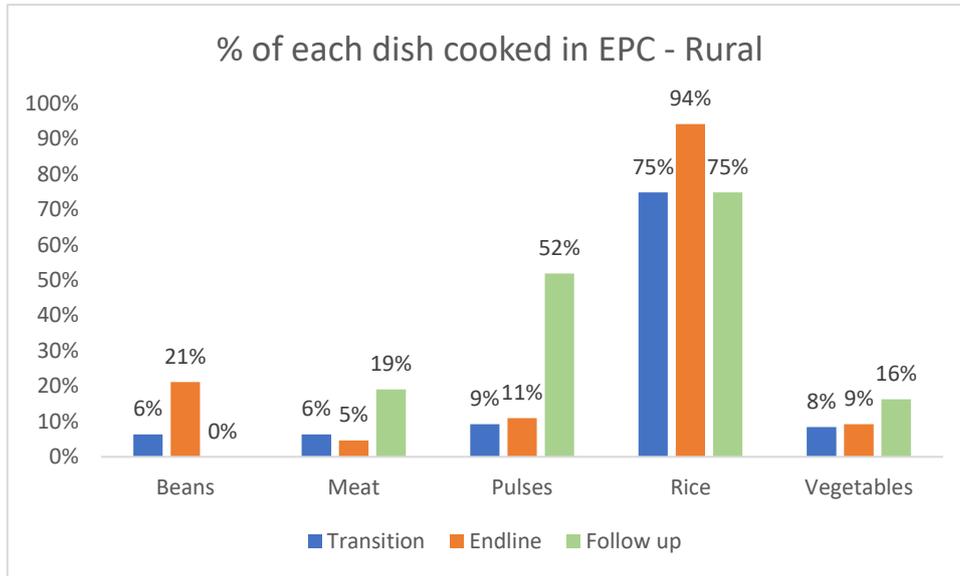


Figure 9: Dish cooked in EPC – rural location

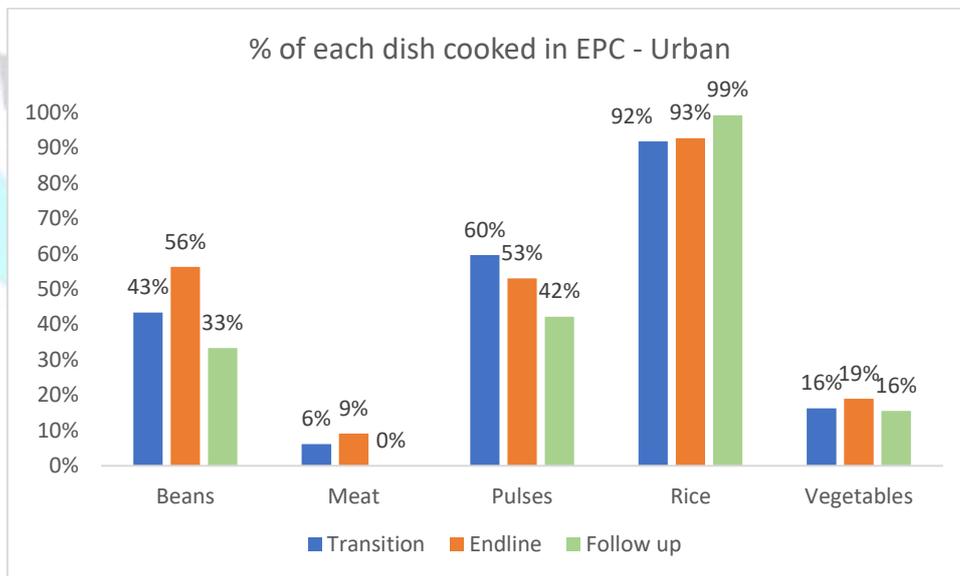


Figure 10: Dish cooked in EPC – urban location

Have cooking practices for ECO participants and non-participants changed since the end of the pilot study? How? Have perceptions of eCooking changed? How? Why?

To understand the change in cooking practice we first analysed the male-female wise dishes cooked/heated during phases of the cooking diary. Both in rural and urban households less than 10% of dishes are cooked/heated by male members of the family (Figure 11). During the endline phase, nearly 18% of dishes were cooked/heated by male members in rural households which came down to 8% in the follow-up phase. However, the dishes cooked/ heated by male members in urban household shows a continuous upward trend over different phases.

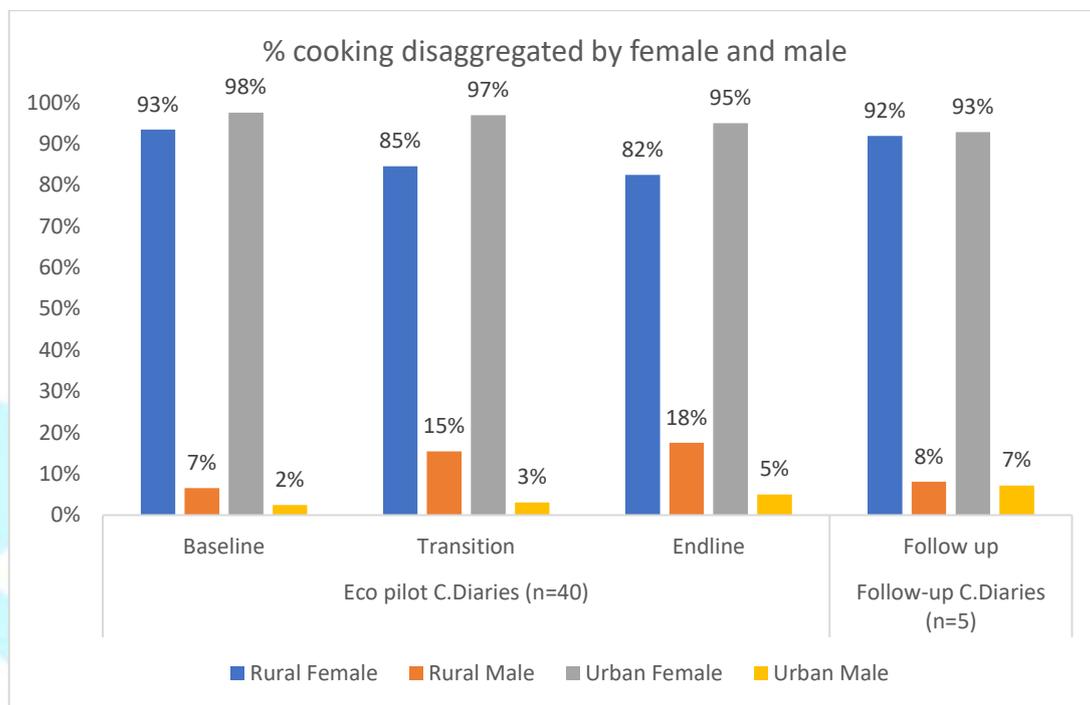


Figure 11: % cooking disaggregated by female and male

Figures 12 and 13 indicates an interesting trend for cooking events carried out by male and female members of the household using different fuels. Follow-up cooking diary data suggest that the percentage of cooking events using electricity is higher for females (49%) than males (30%) in rural households (Figure 12). On the other hand, the percentage of cooking events using wood is higher for males (20%) than females (13%).

The use of electricity for cooking events has increased both for male and female members of the urban household in follow-up phase over the Endline phase (Figure 13). In the follow-up phase, male members of urban households used electricity for 89% of cooking events and LPG for only 11% of cooking events. In the follow-up phase, female household members in urban households used

electricity for 51% of cooking events. Therefore, in the urban households, the transition towards eCooking is visible for both male and female members of the households.

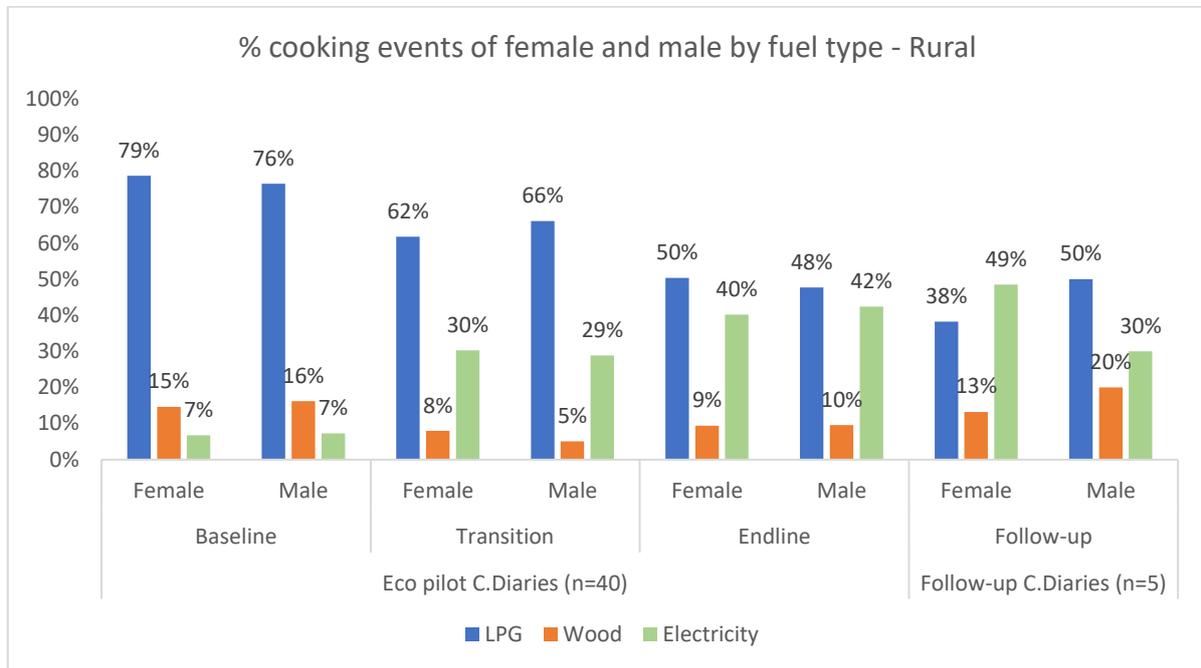


Figure 12: % cooking events of female and male by fuel type - Rural

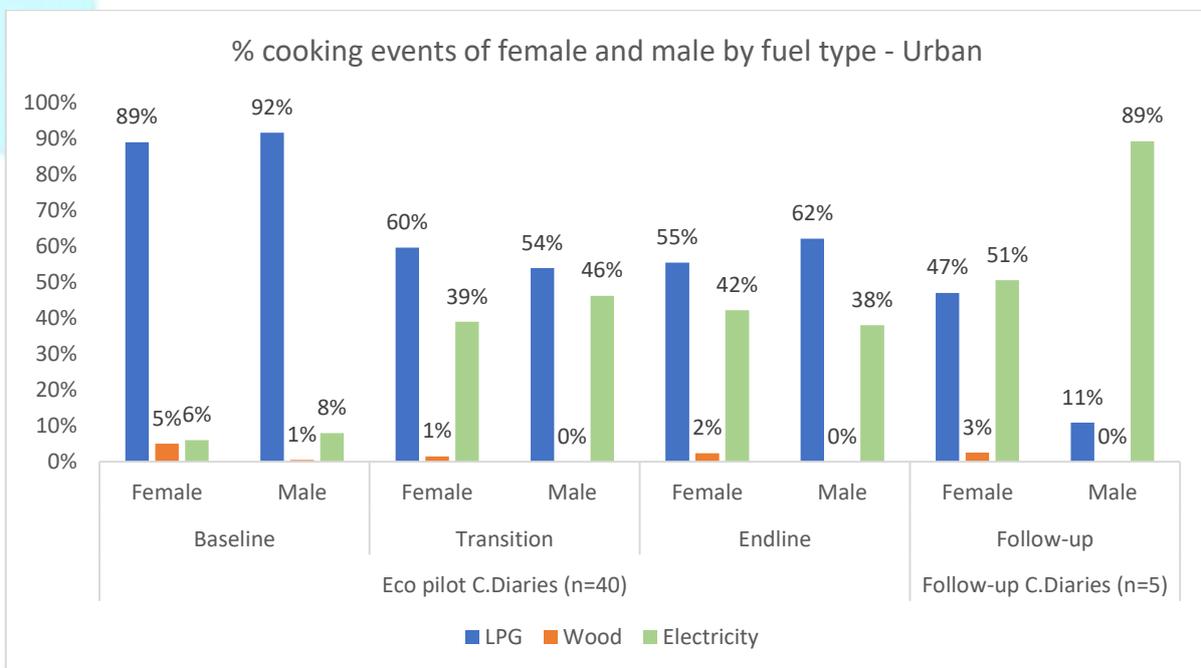


Figure 13: % cooking events of female and male by fuel type - Urban

The comparison of ECO exit survey data with follow-up survey data for change in cooking responsibility has been presented in figure 14. In the ECO exit survey, 38% of respondents revealed that other members of the family started cooking after receiving EPC, which came down to 33% in the follow-up survey. Similarly, 34% of respondents of the ECO exit survey had said that male members of the family started cooking, which also came down to 17% in the follow-up survey. Having said that, it is important to note that the two data sets are not fully comparable as the number of respondents differs significantly.

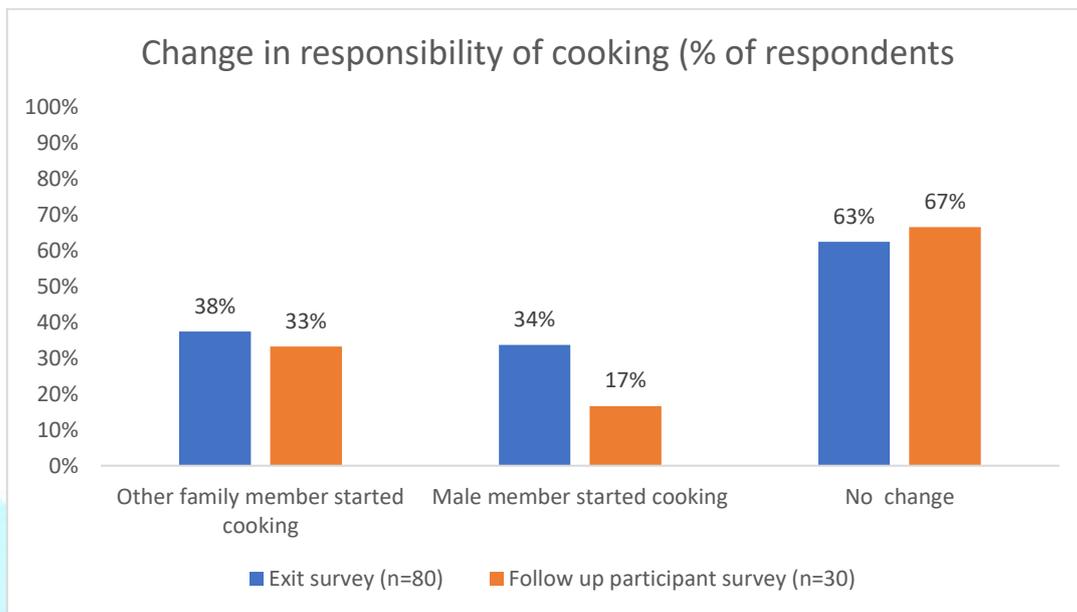


Figure 14: Change in cooking responsibility with access to eCooking

The follow-up participant data reveals that not a single household faced any safety concerns while cooking with Philips EPC distributed under the ECO project. One respondent faced a technical issue with her EPC which was repaired in the Philips service centre in Kathmandu and now it is functioning well.

Out of 30 follow-up survey respondents, 20 faced power outages since the end of the ECO project. They face power outages a few times a month. 13 respondents said that power outages affected their cooking/heating activity and most of them used LPG stoves to cook the food during power outages.

- **Have any ECO participants bought an additional cooking appliance (electric or non-electric) or expressed an interest to do so? What are the opportunities and challenges behind purchasing an additional eCooking appliance device?**

Three out of 30 ECO participants responded that they have bought another cooking appliance. Interestingly all three respondents bought electric appliances – one of them purchased an induction

and two of them purchased an electric kettle. 9 respondents expressed interest in buying another eCooking device – 3 were interested in buying another EPC, 4 were interested in buying induction and 2 were interested in buying an electric kettle. The financial problems, unavailability of deep discounts and unavailability of desired brand eCooking appliances were cited as the main reason for the delay in buying.

More than 63% of surveyed ECO participants have already recommended EPC to their family, friends and neighbours. The main reasons cited for recommending these products are: a) Easy to cook (43%), b) food tastes better (17%), c) saves time (13%), and less costly to cook (10%). More than 66% of participants revealed that their neighbours inquired about EPC.

- **What has been the effects of the reduction in the support mechanisms provided by ECO awardees during the initial ECO pilot studies?**

People have continued using EPC distributed under the ECO project even after the reduction in the support mechanism. All the surveyed participant's EPC are in working conditions. The learning gained during the ECO project has enabled them to smoothly operate the EPC. The overall share of electricity in total cooking events has increased both in the rural and urban households (Follow up cooking diary). The repair and maintenance support is still provided by Women Awareness Centre Nepal (WACN). In case any of the ECO participants, face any technical problem then WACN field staff bring that EPC to the Kathmandu Phillips service centre and get it repaired. The unavailability of after-sale repair and maintenance facility in the local market, remains a challenge.

- **What are the emerging opportunities and challenges regarding the adoption and use of electric cooking in the community?**

It appears that awareness about EPC and its benefits are now known to the participant's neighbours and there is also a willingness to buy it. However, the ability and willingness to pay its full market price are weak. For instance, 13% of respondents said that their neighbours are willing to buy at the same subsidised rate (85% subsidy) as ECO project; nearly 7% said their neighbour will buy at 50% subsidy; 7% said their neighbour will buy at 75% capital subsidy; 33% said they cannot say how much their neighbours are willing to pay. Moreover, even respondents who wish to buy new eCooking appliances including EPC, are waiting for financial support like price discounts or capital subsidies. The unavailability of quality eCooking appliances and repair and maintenance in the local market is hindering the adoption of eCooking. Power outages also hamper the usage of eCooking appliances and compel households to keep standby arrangements like LPG stoves for such situations.

The availability of financial mechanisms to cushion upfront costs like capital subsidies, and consumer loans will accelerate the adoption of eCooking in Nepal. Lowering import duty and Value added tax

(VAT) will also help in cushioning eCooking prices. Improving the eCooking appliance supply chain in small cities will enable consumers for purchasing and repairing them in their nearby cities. Improving the supply of quality electricity is equally important for accelerating the adoption of eCooking in Nepal.

II. ECO NON-PARTICIPANTS

- **Have cooking practices for non-participants changed since the end of the pilot study? How? Have perceptions of eCooking changed? how? Why?**

Altogether there were 50 non-participants (25 rural +25 urban) who were interviewed using MECS structured survey. All the respondents for this interview were females and the age of the respondent was 20-69, covering all age groups. The average family size of the respondent was 4.64 (people cooked for). 20 respondents had their kitchen indoors with no outdoor area for solid fuels, 28 respondents had their kitchen indoors with an outdoor area for solid fuels, and 2 respondents reported that their kitchen is outdoors. Figure 15 presents the availability of cooking devices in non-participants' households. LPG stove has the highest penetration both in the rural and urban location: 84% of rural households and 100% of urban households have access to LPG stove. In rural locations, 8% of non-participant households have access to the electric kettles, which was 60% in the urban locations. Similarly, 8% of non-participants possess induction cooktop in the rural locations, which was 12% in the urban locations. The high availability of LPG stoves both in the rural and urban locations suggests that people in the community are concerned about clean cooking.

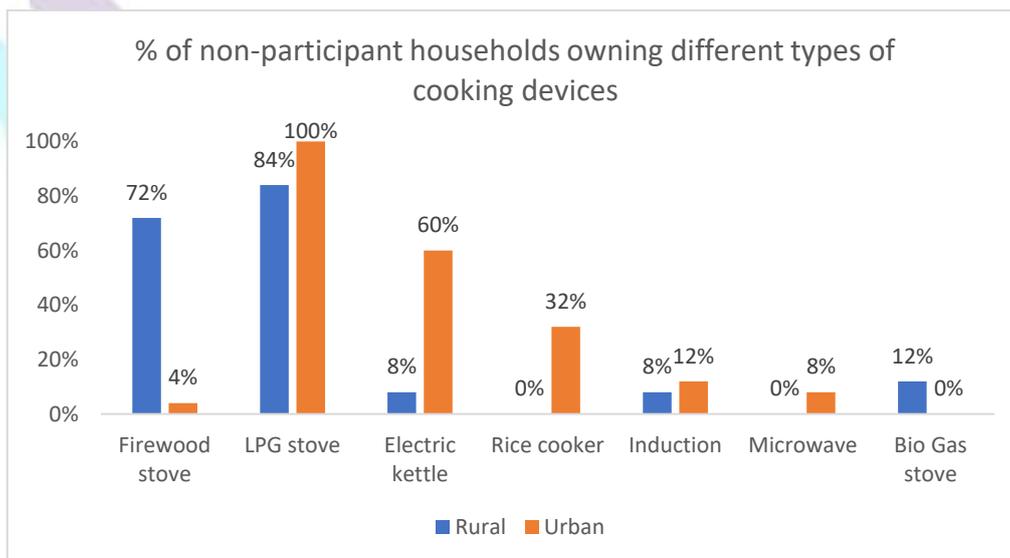


Figure 15: Percentage of non-participant household owning different types of cooking device

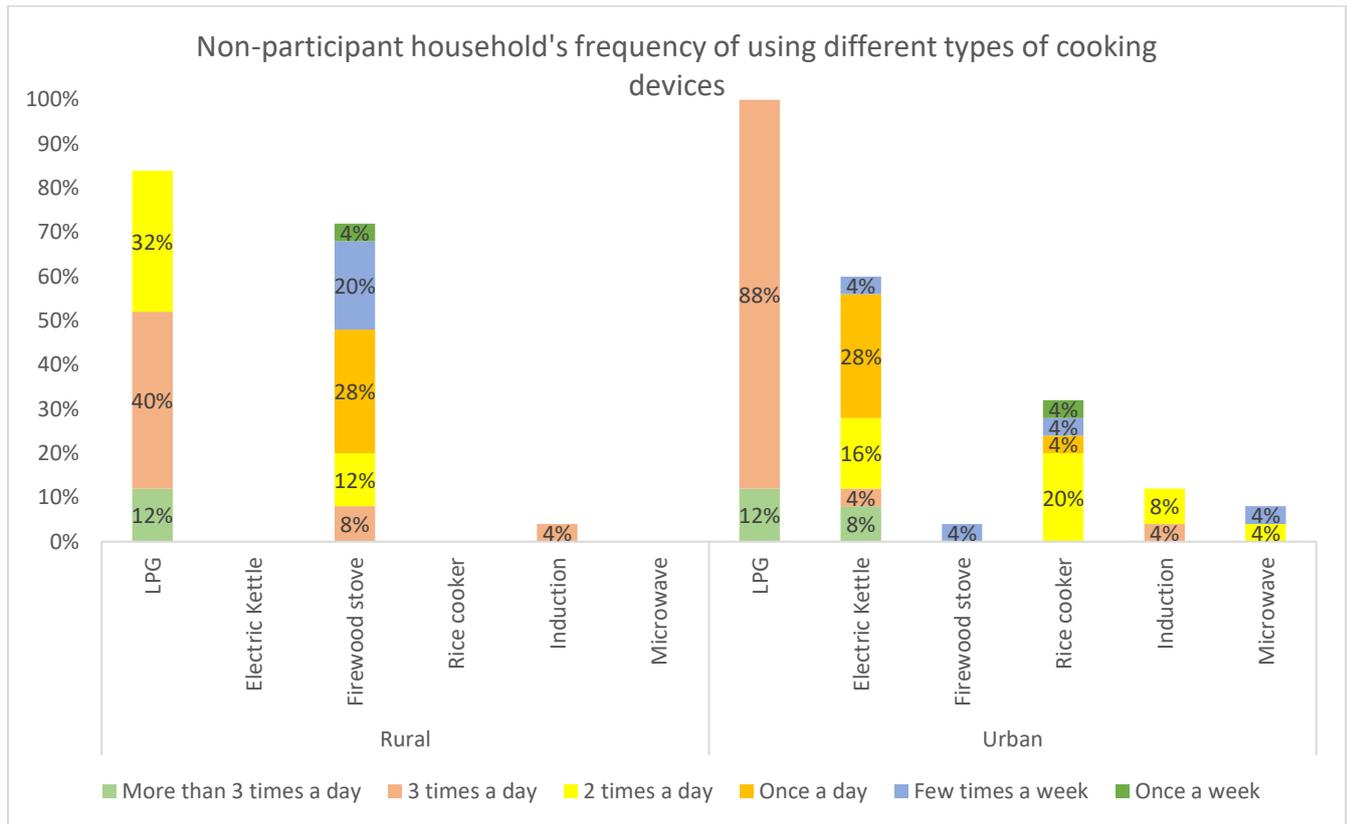


Figure 16: Non-participant household's frequency of using different types of cooking devices

Figure 16 suggests that 52% rural and 100% urban non-participant household uses LPG stoves 3 times or more in a day. 48% rural household uses firewood stove at least once in a day. Electric kettle is though owned by 8% of rural household (Figure 15), but none of them are using it due to breakdown. Similarly, induction is also non-functional in 4% of rural household and requires repairing. Absence of eCooking devices repair and maintenance services in rural area or nearby markets might be hampering its adoption and use by rural households. Electric kettle is used by 56% urban non-participant households at least once in a day. Induction is used at least twice a day by 12% of urban households and 24% of urban household uses rice cooker at least once in a day.

To understand the non-participant's convenience, cost, safety and taste perception about eCooking we have prepared figure 17. Only 2% of respondents strongly agree that it is difficult to cook on electricity, 74% disagree with it and 4% strongly disagree with it. The majority of the respondent disagree that it is expensive to cook on electricity. Similarly, the majority of the respondent feels that eCooking is not unsafe. Figure 17 reveals that 46% of respondent agreed that food cooked on electricity taste better and 18% of respondents strongly agreed to this view. Figure 17, therefore, suggests the high acceptability of eCooking in terms of ease of cooking, cheap running cost, safe cooking and taste of food in the community.

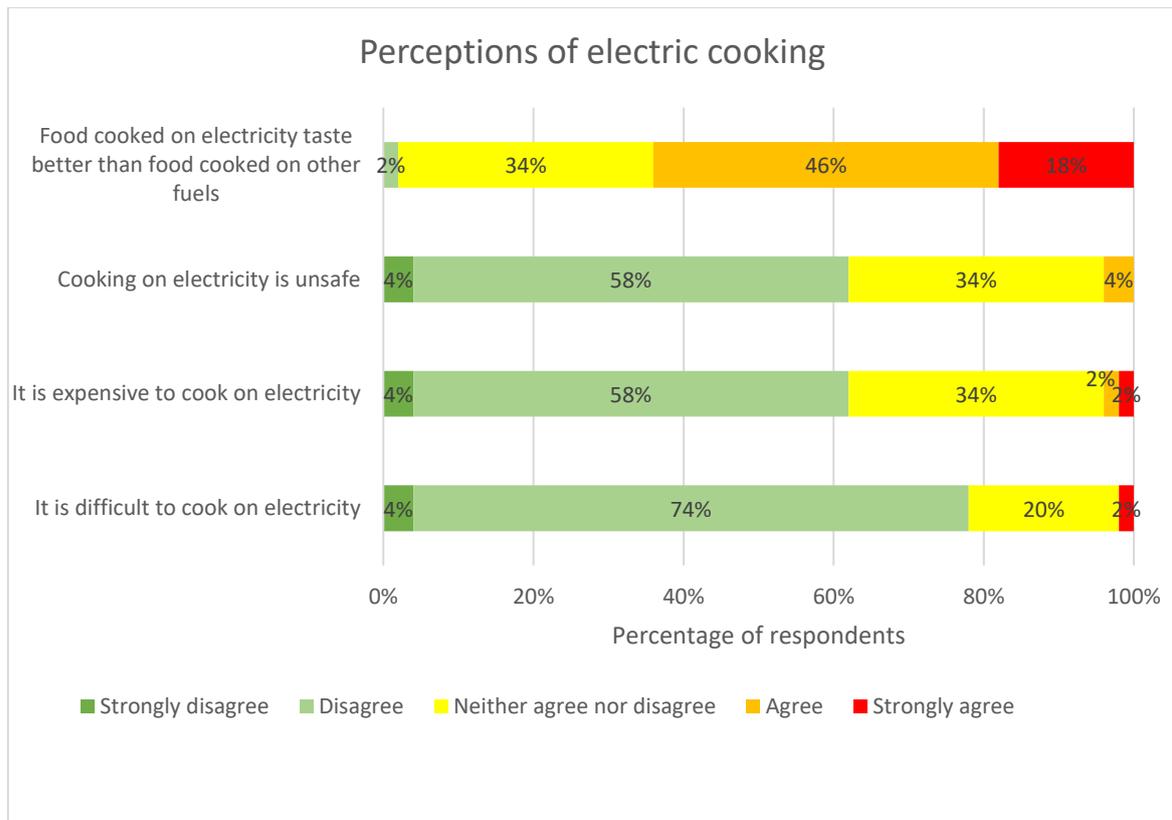


Figure 17: Non-participation perception of electric cooking

Out of the 50 non-participants, 37 responded that their opinions of electric cooking changed over the last year, 10 responded no change in opinion and 3 did not answer about it. Further, 34 non-participants provided details regarding changes in opinion (Figure 18). Figure 18 reveals that 21 respondent changed their opinion about the ease of cooking on electricity now they feel it is easy to cook on electricity. 16 respondents now believe food cooked on electricity is tasty, 16 believe that it is cheap to cook on electricity compared to LPG, 14 respondents now believe that eCooking saves time and 4 respondents now believe that cooking is faster on electricity. Only 2 non-participant respondents said that they have changed their cooking practices over the last one year. They are using more electric devices for cooking.

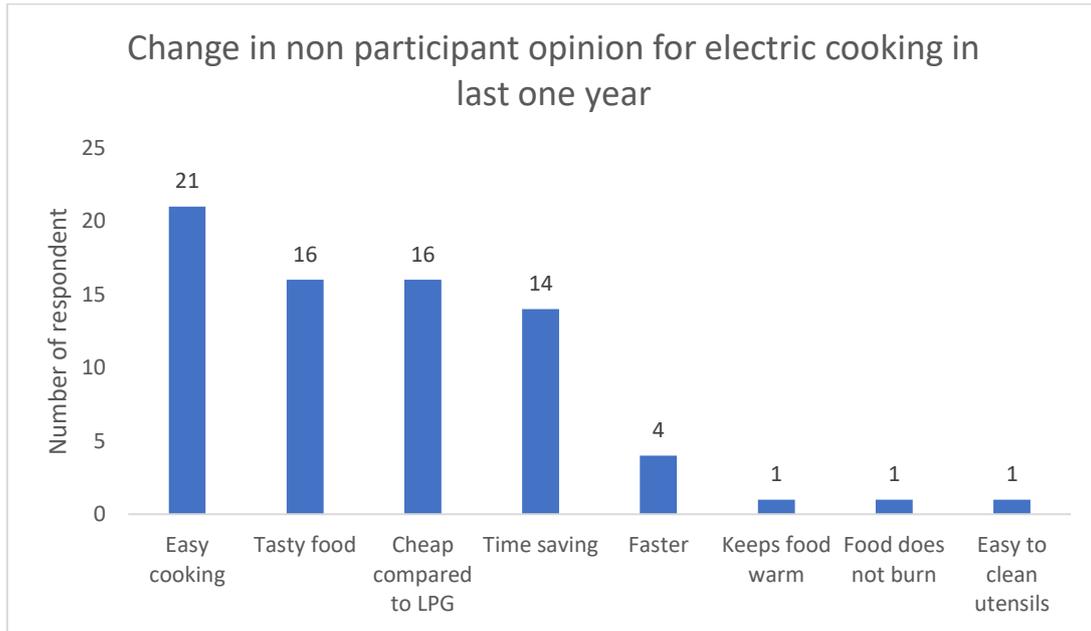


Figure 18: Change in non-participant opinion in last one year

Figure 19 shows the number of respondents who have discussed eCooking with various people/organisations. 40 respondents discussed it with friends, 8 respondents discussed it with NGOs, in the last year. People may find it easy and reliable to seek the opinion of friends and NGOs/Co-operatives working in their area. Out of 40 respondents, who discussed eCooking with their friends, 19 agree and 21 strongly agree that it made them more interested to buy an electric cooking appliance (Figure 20). Among 8 respondents, who discussed eCooking with NGO, 6 strongly agree that it made them more interested to buy an electric cooking appliance.

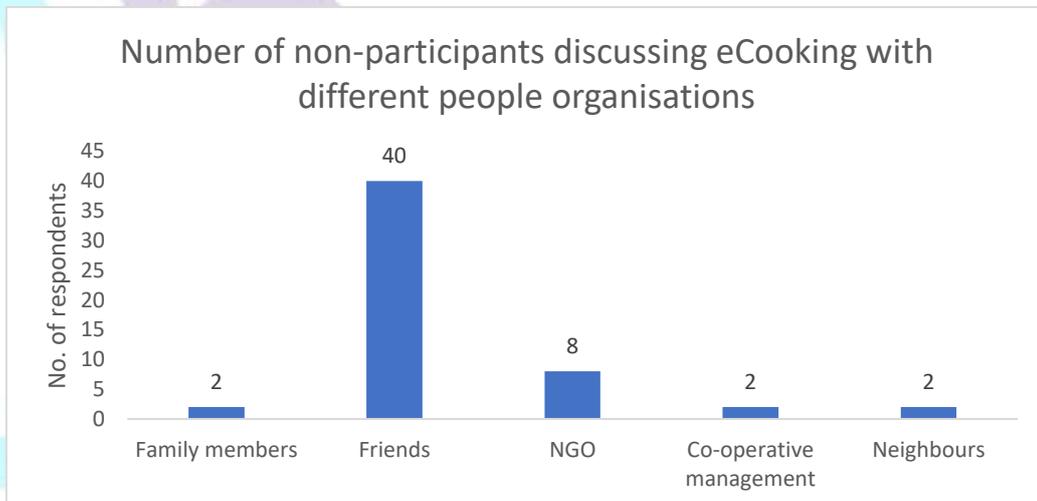


Figure 19: Number of respondents discussing eCooking

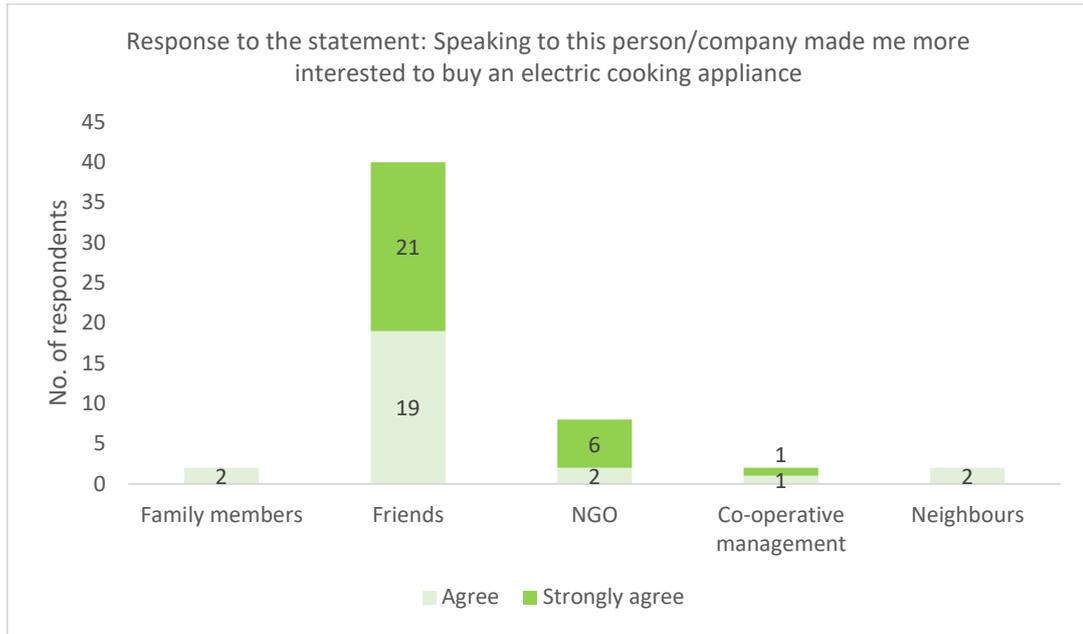


Figure 20: Response to the statement: Speaking to this person/company made me more interested to buy an electric cooking appliance

In the interview, 31 out of 50 respondents said that they know someone who had participated in the ECO project; 19 said they do not know anyone who had participated in the ECO project. All 31 respondents said that ECO project beneficiaries recommended them to buy EPC. The main benefits communicated by ECO project participants to non-participants are presented below. Figure 21 shows that 23 respondents received positive feedback, from ECO participants, for the taste of food, 21 got positive responses for the ease of cooking, 13 respondents got feedback about time-saving (no monitoring required), and 7 respondents were told that it is cheaper to cook in EPC compared to LPG. In the non-participant interview, 16 respondents “Agree” and 15 respondents “Strongly agree” that speaking to an ECO participant made them more interested to buy an electric cooking appliance.

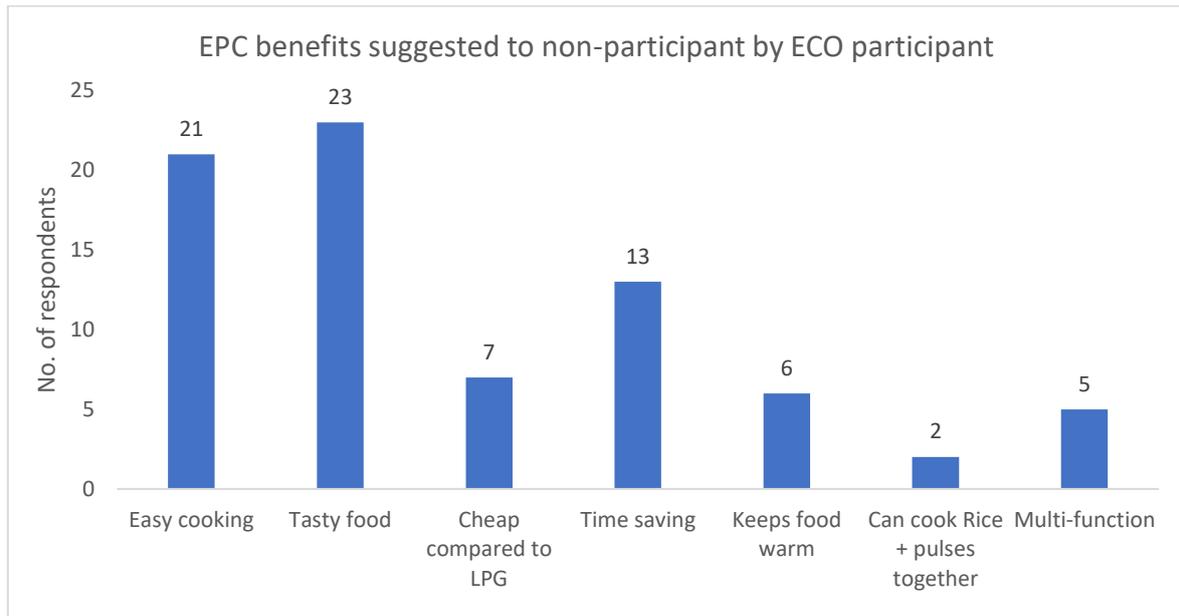


Figure 21: EPC benefits suggested to non-participant by ECO participant

Figure 22 reveals that 44 non-participant respondents were aware of the ECO project. Out of these 44 respondents, 22 said that their opinion had changed about eCooking, 10 said that their opinion had not changed about eCooking and 12 did not respond. 6 respondents who had not heard about the ECO project also not responded. Out of 50 respondents, 21 said that their opinion had become more positive for eCooking (Figure 23). None of the non-participants reported any change in cooking practice since the ECO project started.

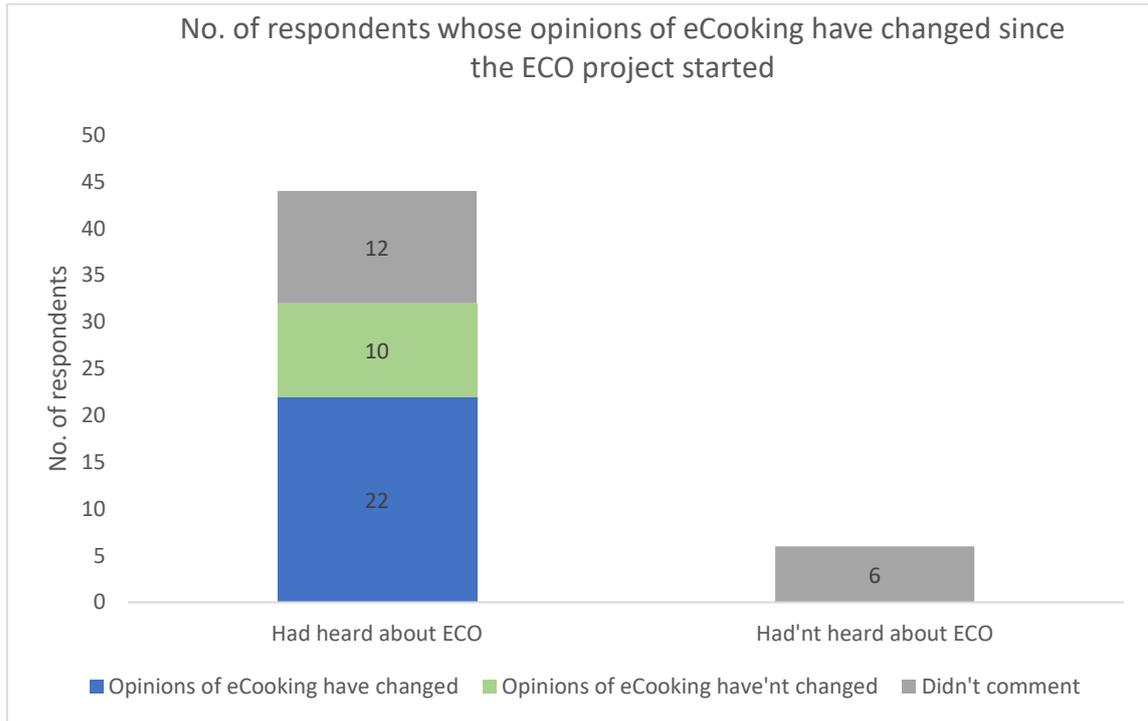


Figure 22: Respondents whose opinions of eCooking have changed since the ECO project started

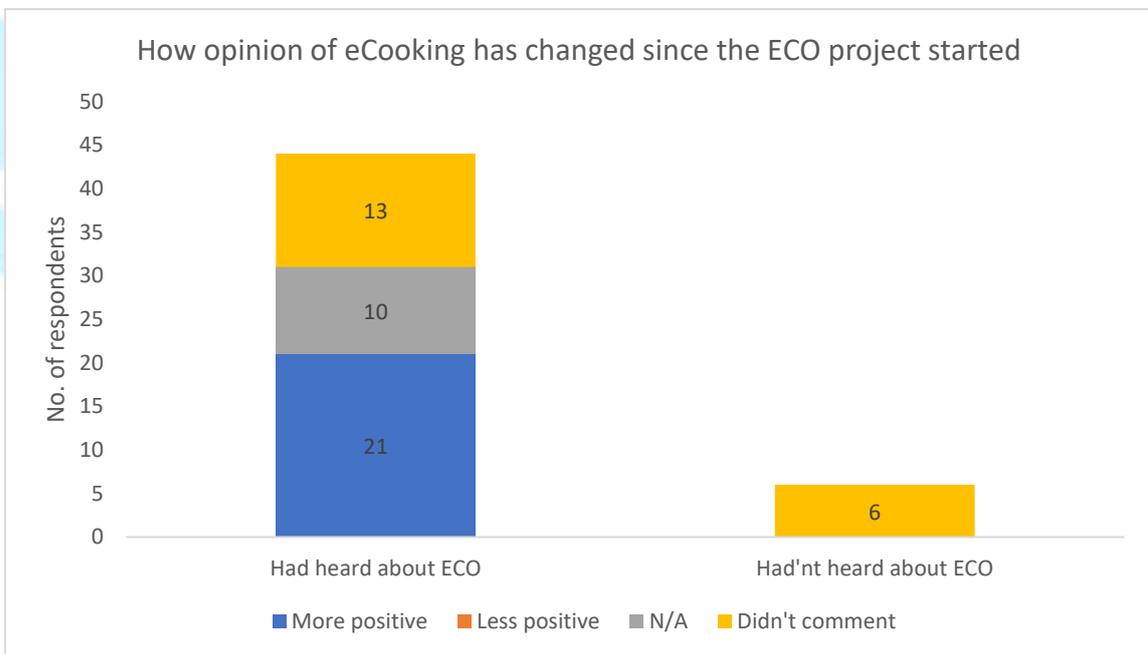


Figure 23: Change in non-participant opinion since the ECO project started

- **Have any ECO non-participants started using eCooking appliances or expressed an interest to do so?**

The analysis of the non-participant survey reveals that 2 respondents bought eCooking devices in the last one year- one rice cooker and one electric kettle. However, all 50 non-participants expressed interest in buying eCooking devices. Figure 24 below presents that the respondent’s willingness to buy eCooking devices. Nearly all the respondents want to buy EPC. The highest inclination to buy EPC may be due to the positive impact of the ECO project. The benefits of cooking in EPC explained by the ECO participants may have positively changed their opinion about buying it.

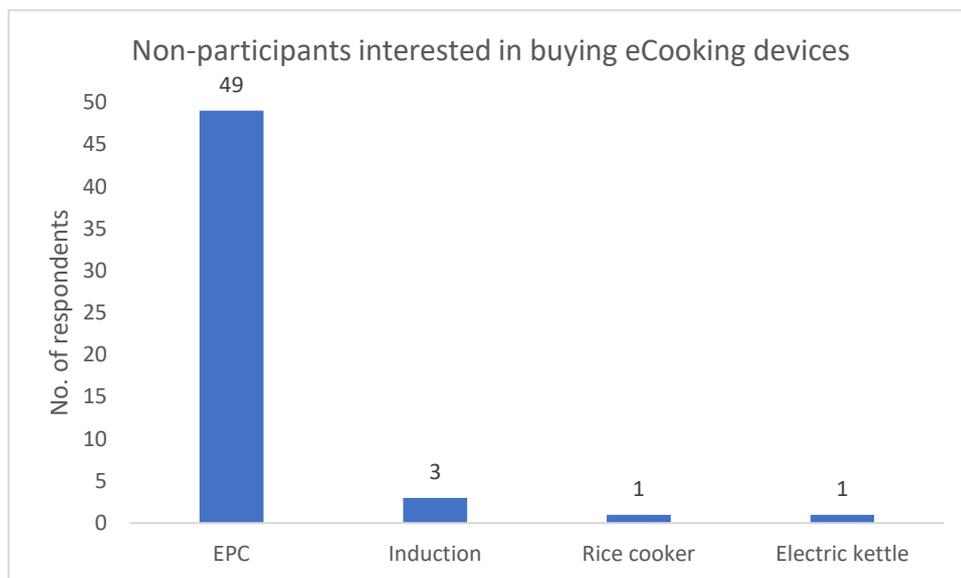


Figure 24: Non-participants interested in buying eCooking devices

- **What are the opportunities and challenges for non-participants to start using electric cooking?**

From the analysis of non-participants interview, it appears that eCooking appliances reach in Nepalese kitchen is increasing over time but the pace of transition to eCooking is slow. LPG stoves are currently the most commonly used clean cooking in the surveyed household, both in the rural and urban locations. However, there is a strong liking to buy eCooking appliances. The majority of the respondents find eCooking convenient, cheap, and safe, which cooks tasty food (Figure 17). The awareness for eCooking has also increased significantly since the start of the ECO project through discussions with friends, NGOs, neighbours etc. For instance, at the start of the ECO project rarely any cooperative member was aware of EPC and its benefits. But during the present study, even non-participants were aware of EPC and its benefits. The majority of the respondents care about positive evaluation and suggestions before purchasing an eCooking appliance (Figure 25). Community people's opinion matters, as the majority of the respondents value their opinion. Therefore, positive feedback from ECO participants may have encouraged community members to buy eCooking appliances.

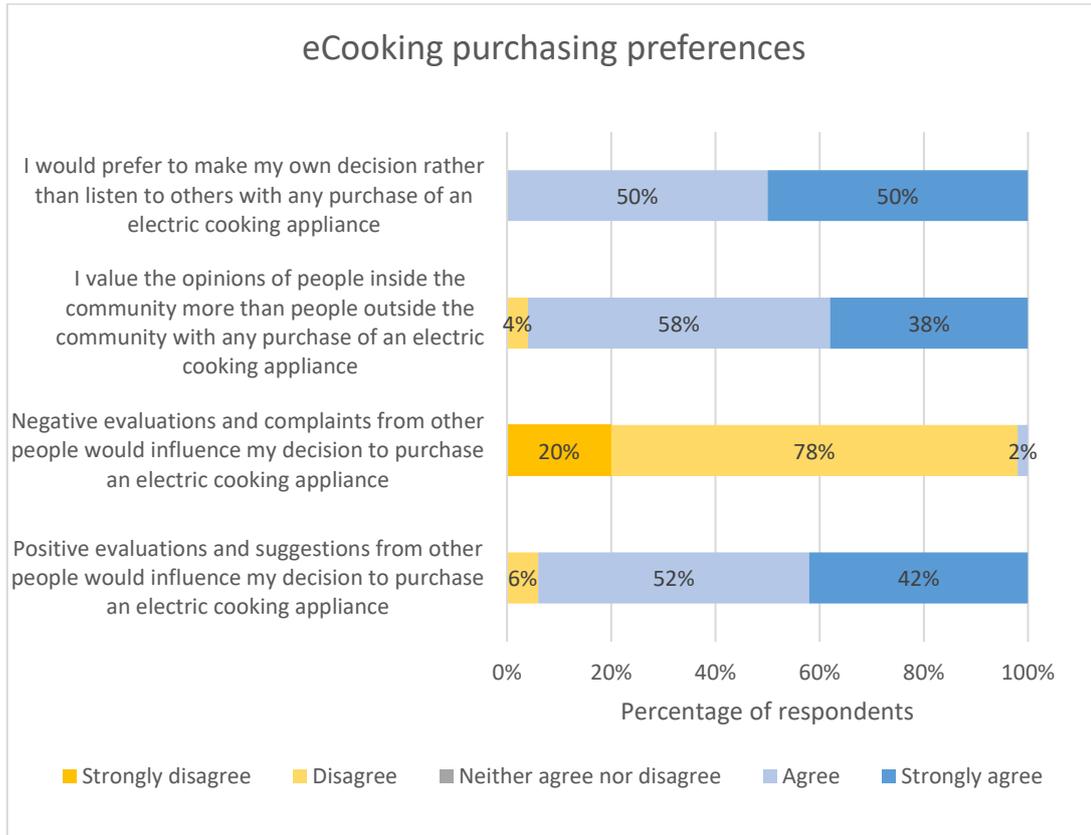


Figure 25: eCooking purchasing preferences

Out of 50 non-participants, 45 respondents said that they do not think there will be any challenges for them to access or use electric cooking. Only 5 respondents said that access or use electric cooking will be a challenge for them; three respondents feel that learning eCooking to use a device will be a challenge, one respondent feel that ability to pay will be a challenge and one respondent has a problem with her electric connection.

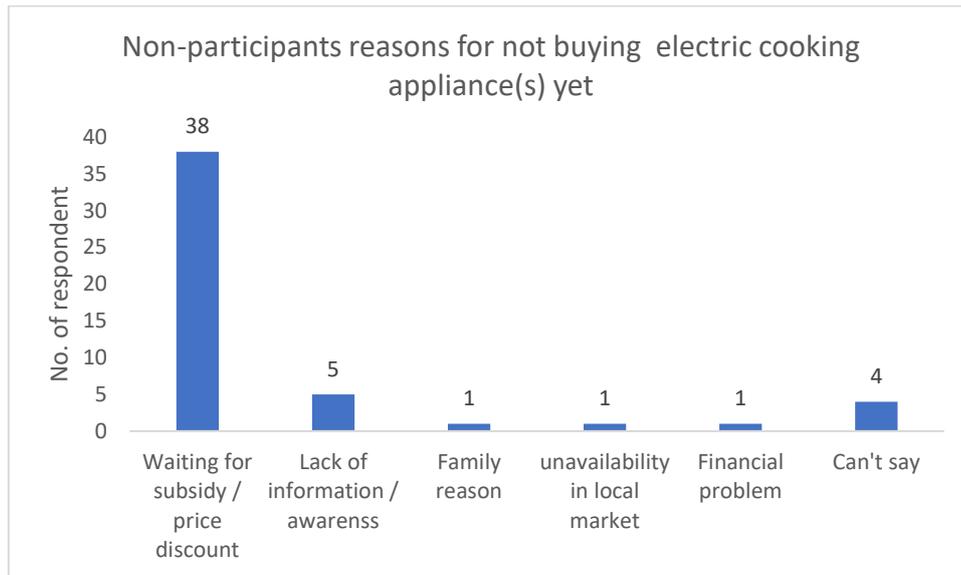


Figure 26: Non-participants reasons for not buying electric cooking appliance(s) yet

The main challenge for the adoption of eCooking appliances seems to be its high upfront cost, as 76% of non-participants responded that they are waiting for some subsidy or price discount to buy desired eCooking appliances (Figure 26). Financial problem is another reason for not adopting eCooking. The unavailability of quality eCooking appliances in the local market and the lack of awareness or information about suppliers of eCooking appliances is another challenge.

Improving the supply chain, implementing a subsidised eCooking appliance program, availability of financial instruments for cushioning upfront costs and simultaneously raising awareness on the community will help non-participants to start using electric cooking.

III. OUT SCALING ELECTRIC COOKING

- **What are the ways in which the ECO pilot studies could serve as launchpads to ‘out scale’ eCooking in the community and its surroundings?**

The growing rate of electricity access to households in Nepal provides an opportunity to out scale eCooking in Nepal. Transitioning to sustainable cooking could yield a wide range of benefits. MECS ECO pilot is a timely intervention to introduce eCooking in the Nepalese community and added substantially to the discussion across the board including community members, NGOs, policymakers about the potential and benefits of eCooking in Nepal. The study identified challenges to the large-scale adoption of eCooking by the Nepalese communities. This study finds that households having access to eCooking appliances reduce their LPG use. Access to a reliable supply chain which includes access to repair and maintenance services apart from availability for eCooking appliances is a challenge to the vast majority of the population. There is a lack of awareness about the cost and benefits of eCooking to majority of community people. The upfront cost of quality eCooking appliances is another impediment for poor households limiting adoption.

Transitioning to electric cooking requires access to both quality electric appliance supply chains in close proximity to community settlements and reliable electricity supply, especially in the morning and evening time. Measures need to be taken to cushion the upfront cost of eCooking appliances. This can be done through lowering taxes and tariffs to make the eCooking devices affordable to a large section of the population. Another way to make eCooking appliances affordable is to provide some sort of capital subsidy, similar to the ECO project, which has been very popular among communities. Developing credit facility instruments will also help in “Out scaling” eCooking in Nepal.

ECO project was implemented in WACN network of Saving and Credit Co-operatives (SACCOs) (IRADe-WACN, 2022). Over a period of time, WACN has developed a strong bonding with each of its SACCOs community member. These SACCOs community members have deep trust in WACN initiatives and programs. The interaction and demonstration workshops organised by WACN boosted the community confidence in EPC. WACN leveraged the social capital developed with its SACCOs community to convince them to purchase and use EPC. The continuous after sales assistance provided by field staffs of WACN helped the participants to learn cooking in EPC. Living in the close vicinity and day to day interactions in SACCOs, enabled cross learning among participants, for cooking in EPC. The repair and maintenance support provided by WACN, even after the end of ECO project, lead to sustainable use of EPC among participant households. Increasing and sustained use of eCooking devices by participants in ECO and Follow up study suggests that SACCOs network can serve as a launch pad to ‘out scale’ eCooking in Nepal. Being a financial institution SACCOs can also provide credit support to its members to overcome the problem of upfront cost of eCooking devices. This approach can be implemented in large number of SACCOs to accelerate the transition to eCooking in the country.

4. CONCLUSION

MECS ECO pilot studies demonstrated that Nepalese households could cook a significant proportion of their daily consumption of meal on electricity on a sustained basis provided they have access to eCooking appliances at home. These findings encourage a follow-up study to further assess the impact of the ECO pilot studies on cooking practices in the Nepalese communities over a longer timeframe. The study focussed on understanding whether there is any change in the eCooking practices among ECO pilot study participants. The impact of ECO pilot studies on the community in terms of views, level of awareness creation, etc. especially on the households who were not ECO participants is important in order to understand the potential opportunities for further local uptake of eCooking.

The use of electricity for cooking is gradually increasing among the ECO participants belonging to both rural and urban areas. This finding suggests that ECO pilot demonstrations have a positive impact on the usage of a suite eCooking appliances by households. They have learned the advantage of eCooking. They are not only using the eCooking appliances which were provided to them as part of the ECO pilot study rather other eCooking devices like, induction, electric kettles, etc. are added to their kitchen. The appliance level analysis suggests that usage of non-EPC eCooking devices has increased significantly among the ECO pilot participants however the usage of EPC at the household level or either at the same level or increased only marginally. The share of traditional cooking fuels such as LPG and fuel wood has further reduced making the overall cooking fuel stack cleaner at the household level. As expected adoption of eCooking in urban communities is faster than in rural communities may be due to several other factors which are beyond the scope of this study.

The high availability of LPG stoves both in the rural and urban locations suggests that people in the community especially the non-ECO participant households are concerned about clean cooking. Only 2 % of them feel it is difficult to cook with electricity suggest that there is wide acceptance among the non-ECO participant household about the potential of eCooking as a viable and sustainable cooking technology. More than 3/4th of non-ECO participants feel that their views have changed over the year about the viability of electricity as a cooking option. The finding suggests high acceptability of eCooking in terms of ease of cooking, cheap running cost, safe cooking and taste of food in the community.

The cooking practices of the community is progressively changing as dishes cooked/ heated by male members in urban household shows a continuous upward trend over different phases after the introduction of eCooking in the household. eCooking is perceived as a safe appliance for cooking. Contrary to the traditional belief that it will be a difficult appliance for not-so-literate households to handle our findings suggest minimal technical difficulties were faced by households in learning how to cook with eCooking devices. Moreover, these difficulties could be easily overcome with training and by leveraging the collective learning potential of the community members.

5. RECOMMENDATIONS

The Government of Nepal (GoN) has a target to have clean cooking in all Nepali households by 2030. From a clean cooking energy perspective, electricity is one of the most promising technological options given Nepal's immense hydroelectric potential. In the recent past substantial progress has been made to promote

eCooking. However, there is still a long road ahead to achieve widespread adoption of eCooking in Nepalese households. This study provides a timely suggestion to build on the ongoing momentum to have extensive adoption of eCooking in Nepal. Based on the data collected and analysis as well as field experiences the recommendations are divided into five groups:

1. Strengthening eCooking appliance uptake and supply chain: the study found that lack of availability of appliances, and repaired and maintenance service centers in close proximity may dissuade household possession of appliances. A reliable and sustainable supply chain for eCooking appliances would go a long way to promote eCooking adoption.
2. Economic affordability (mitigating upfront capital requirement to possess eCooking appliances): The research suggests that the upfront cost of possession of eCooking appliance is a barrier for many households. A customized innovative financing option especially for poor households would be helpful to mitigate the challenge.
3. Strengthening electricity supply infrastructure: reliable electricity supply at the household level is an important step towards ensuring the adoption of eCooking. Our analysis found that in the absence of electricity supply, many households had to use other available cook stoves. The distribution of eCooking appliances in the ECO pilot study took place after monitoring household electrical safety provisions and electric connections. Upgradation of electricity connection and electrical safety provision at the household level will smoothen the path of transition to eCooking.
4. Technology acceptability (awareness creation among the community about eCooking): Evidence from the study suggests acceptance of eCooking appliances by households both in the rural and urban areas. However, outscaling this evidence about health and economic benefits, and safety advantages is needed for sustained behaviour change. As clearly demonstrated by this study, community word-of-mouth can be an effective awareness raising mechanism to build community confidence in eCooking. eCooking demonstration campaign, and community outreach through local mass media or social media could be effective tools to generate awareness.
5. Regulation and policies: To make prices of eCooking devices more affordable, Government policy should reduce the import duty and value added tax on eCooking appliances. Government of Nepal can also target to provide capital subsidy for eCooking appliances. Nepal Energy Efficiency Programme (NEEP) should prescribe minimum energy performance levels (energy ratings) for eCooking appliances to provide the consumer an informed choice about the energy saving and thereby the cost saving potential. Regulation needs to be framed for safety standards of eCooking appliances to protect consumers against hazards such as electrical, mechanical, thermal, fire and radiation.

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APPENDIX-I

PARTICIPANTS FEEDBACK



"What I enjoy best about EPC is that you can cook anything in it and the meal you make using it tastes a lot like food you make with firewood 3 stone fire. I have also recommended others to use EPC."

-Til Kumari Timalsina

Member, Sahara Nari Chetana

Banepa M



"EPC-cooked food is quite good in taste. With all the time it has saved me, I can now work on my farm to cultivate leafy greens and vegetables and complete my other household chores. I have been using this EPC for 1.5 years. I consider EPC to be very cost-effective as my LPG cylinder now lasts two months instead of just one month like it did in the past."

-Mina Thapa Magar

Member, Sahara Nari Chetana

Banepa M