

Consumer Preferences for Electric Vehicle in Kathmandu

Anish Pokhrel and Sumit Pradhan*

Abstract

This study examines the consumer preferences for electric vehicles in Kathmandu. Consumer preferences are the dependent variable. The selected independent variables are financial attributes, technical attributes, charging availability, social influence, and environment concern. The primary sources of data are used to assess the opinions of respondents regarding financial attributes, technical attributes, charging availability, social influence, and environment concern. The study is based on the primary data of 128 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation and multiple regression models are estimated to test the significance and importance of the Consumer preferences for electric vehicle in Kathmandu.

The study showed that financial attributes is positively correlated with consumer preferences for electric vehicles, it means that financial attributes influence consumer preference for electric vehicles. Likewise, technical attributes is positively correlated with consumer preference for electric vehicles, it means that technical attributes influence consumer preferences for electric vehicles. Similarly, charging availability is positively correlated with consumer preferences for electric vehicles, it means that charging availability influence consumer preference for electric vehicles. Likewise, social influence is positively correlated with consumer preference for electric vehicles, it means that social influence consumer preference for electric vehicle. Moreover, environment concern is positively correlated consumer preference for electric vehicle it means that environment concern influence consumer preference for electric vehicles.

Keywords: financial attributes, technical attributes, charging availabilities, social influence, environment concern

1. Introduction

Electric vehicles generate a range of benefits including decreased reliance on imported oil, insulation from oil price shocks, and a reduction in environmental impacts (Babaee *et al.*, 2014). According to Kintisch (2008), the replacement of conventional vehicles (CVs) by electronic vehicles has been an inevitable trend around the world. An increasingly hot debate on whether the replacement of CVs by electric vehicles should be delayed or accelerated has surfaced among researchers, enterprises, and governments. Many governments have initiated and implemented policies to stimulate and encourage Electric vehicle production and adoption (Sierzchula *et al.*, 2014).

According to Jorgensen *et al.* (2008), the automotive industry has introduced hybrid cars, such as the Honda Insight and the Toyota Prius that minimize the use of combustion engines by integrating them with electric motors. One potential renewable energy device to power vehicles is the FC. Wu *et al.* (2019) explored factors affecting the public acceptance of autonomous electric vehicle by using data collected from an online survey in China. Considering the potential environmental benefits of electric vehicle, they evaluated the environmental concerns that affect people's intentions of buying autonomous Electric vehicle. The study showed that perceived usefulness, perceived ease of use, and environmental concern have positive relationship with consumers' intentions to purchase autonomous electric vehicle. In addition, Wang *et al.* (2018) analyzed the effects of consumer knowledge about electric vehicle, perceived risks, usefulness, and current financial incentives.

* Mr. Pokhrel is a Freelance Researcher, Kathmandu, Nepal and Mr. Pradhan is the Research Faculty, Uniglobe College (Pokhara University affiliate), Kathmandu, Nepal.

The study showed that consumer awareness about electric vehicle has a positive effect on perceived usefulness, attitude, and intention to purchase electric vehicle. The study showed that it is negatively related to perceived risks. Further, to identify the interacting factors in the relationship between perceived value and adoption of Electric vehicle.

Bjerkkan (2016) investigated incentives for promoting battery electric vehicle (BEV) adoption in Norway. The finding showed that there are clear bounds between incentive groups, both in terms of age, gender, and education. Income is a less prominent predictor, which probably results from the competitive price of electric vehicle in the Norwegian market. Similarly, Harrison (2017) investigated an exploratory policy analysis of electric vehicle sales competition and sensitivity to infrastructure in Europe. The study found that there is a correlation between EV uptake and infrastructure subsidies. Muller (2019) explored comparing technology acceptance for autonomous vehicles, battery electric vehicles, and car sharing. The study found that statistically not significant paths can only be found for relationships including the Attitude towards environmental protection (ENV) and Innovativeness (INV) as personal attributes. Interestingly, control variables tested (age and gender) proved to be not significant influences. Only the Perceived Ease of Use decreases with age.

White (2017) investigated environmentalist and social innovator symbolism drives electric vehicle 2 adoption intentions. The study found that seeing electronic vehicles (Electric vehicle) as environmentalist and social innovator symbols partially mediates the relationship between concern about climate change and EV adoption intentions. Similarly, Li (2017) investigated a review of factors influencing consumer intentions to adopt battery electric vehicles. The study found that the intention for consumers to adopt Electric vehicle is likely to be a mixture of demographic, situational and psychological factors. Feng (2020) investigated identifying promising technologies of electric vehicles from the Perspective of Market and Technical Attributes. The study provided relevant enterprises with innovative improvement directions for electronic vehicles, thus contributing to global energy efficiency and environmental protection.

Higgins (2017) explored how vehicle body type affects consumer preferences for Electric Vehicles. The study revealed significant heterogeneity in choice of powertrain across vehicle segments, with luxury and pickup buyers among the most distinct Higgins also concluded that factors like age, education, and the importance of fuel economy and reduced or eliminated emissions generally play a consistent role in improving the utility of Electric vehicle. Li (2020) investigated public preference for electric vehicle incentive policies in China. The study showed that less than one third of consumers are familiar with EV incentive policies, whereas more than half of them is unfamiliar with these policies. For consumers, the relative importance of different policy categories is ranked as follows: charging incentive policies, driving incentive policies, vehicle registering incentive policies, and purchasing incentive policies.

Individuals who are more interested in the practical aspects of the car as opposed to design are less affected by price (Glerum *et al.*, 2014). Price, income effect, preferred sized, design negatively affect the decision to purchase a car, which gives electric vehicle Electric vehicle an edge over conventional vehicle (CV) since electric vehicle, electric vehicle generally has lower energy costs. Mock & Yang (2014) found that the marginal utility of fuel

cost for EV is much higher than for conventional vehicles (CV).

Jensen *et al.* (2013) found that the marginal utility for driving range is much higher for an electric vehicle than for a conventional vehicle (CV), which is probably due to the large difference in range between these two car types. Franke and Krems (2013) found that throughout a trial period drivers became more relaxed.

The study found that it is important to provide fast charging as well as short queuing times at charging stations, and that a reservation system could help in addressing queuing time and associated uncertainty concerns. Costa (2022) stated that electric vehicle are an important and novel technological innovation that is expected to disrupt the automotive industry and benefit the environment. Social influence is a vast and articulated concept. It can be defined as the sum of various forms of reciprocal and non-reciprocal interactions, and of behavioral and cognitive factors that lead to changes in an individual's thoughts and behaviors (Balla *et al.*, 2018).

In the context of Nepal, Adhikari (2020) investigated identification and analysis of barriers against electric vehicle use. The result revealed that infrastructure, policy, economic, and technical barriers pose more pressing concerns than social barriers. The lack of charging stations, relatively higher purchase price of Electric vehicle compared to internal combustion vehicles, and poor long-term planning and goal setting on the part of the government were ranked as the top three barriers against Electric vehicle uptake in Nepal. Pandey (2019) investigated climate resilient pathway for developing nations: case study of electric vehicle market in Nepal. The study concluded that lack of government coordination, and efforts to introduce and implement policies to move towards the climate resilient pathway towards development.

Shandilya (2021) investigated people's perception towards adoption of electric vehicle in Kathmandu Valley. The result showed people having positive affinity for sustainability (73.7%) and electric vehicles, very few (only 8%) actually owned electric vehicles. The gap is mainly due to barriers of cost, infrastructure and policies. Neupane (2022) investigated socio-technical analysis towards the adaptation of electric vehicles in Kathmandu. The findings revealed significant association in interest in Electric vehicle, Interest in AFV, Purchasing AFV by demographic variables. Similarly, Krupa (2019) explored barriers and opportunities to electric vehicle development in Nepal. The study found that EV development in Kathmandu can be summarized by the failure to appeal to a wider demographic and lack critical infrastructure for mass public participation.

The above discussion shows that empirical evidences vary greatly across the studies on the consumer preferences. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the consumer preferences for electric vehicle in Kathmandu. Specifically, it examines the relationship of financial attributes, technical attributes, charging availability, social concern and environment concern confusion with consumer preferences.

The remainder of this study is organized as follows: section two describes the

sample, data, and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 128 respondents through a questionnaire. The study employed convenience sampling method. The respondents' views were collected on financial attributes, technical attributes, charging availability, social influence, and environment concern within Kathmandu Valley. This study is based on descriptive as well as causal comparative research designs.

The model

The model used in this study assumes that stress among undergraduates depends upon selected independent variable. The dependent variable selected consumer preferences. Similarly, the selected independent variables are financial attributes, technical attributes, charging availability. Social influence and environment concern. Therefore, the model takes the following form:

Consumer preferences for electric vehicles in Kathmandu = f (consumer preferences),

More specifically,

$$CP = \beta_0 + \beta_1 FA + \beta_2 TA + \beta_3 CA + \beta_4 SI + \beta_5 EC$$

Where,

CP = consumer preferences

FA = Financial attributes

TA = Technical attributes

CA = charging availability

SI = social influence

EC = environment concern

Financial attributes were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Electric vehicles are financially accessible to the average consumer". "The overall cost electric vehicle is a significant factor in my decision-making process." and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.732$).

Technical attributes was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Electric vehicles offer a sufficient driving range on a single charge for my daily needs", "The availability and accessibility of charging infrastructure positively influence my perception of electric vehicles" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.742$).

Charging availabilities was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel there is ample availability of local charging stations, making it convenient for me to charge my electric vehicle.”, “I can depend on public charging stations for consistent and efficient charging “ and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.715$).

Social influence were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Positive endorsements or usage of electric vehicles by celebrities influence my perception.”, “Driving an electric vehicle is socially acceptable and positively perceived by others” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.734$).

Environment concern was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Owning an electric vehicle is an effective way to reduce my carbon footprint and contribute to environmental conservation”, “Owning an electric vehicle enhances my personal image as an environmentally conscious and responsible consumer” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.760$).

Consumer preferences was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Charging facilities has huge influence on consumer perception on electric vehicle.”, “Social influence plays a vital role in consumer perception on electric vehicle.” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.711$).

The following section describes the independent variables used in this study along with the hypothesis formulation.

Financial attributes

Financial attributes refer to various types of monetary costs of vehicle purchase and use. Price preferences also vary among populations. Rasouli and Timmermans (2013) found that heterogeneity is particularly high when the price of electric vehicle Electric vehicle is much higher than conventional vehicles (CV). Several studies discovered an income effect, namely that people with high incomes are less price-sensitive than others (Valeri & Danielis, 2015). People who choose used cars also find price to be more important (Hoen & Koetse, 2014). Based on it the study developed the following hypothesis:

H₁: There is a positive relationship between financial attributes and consumer preferences.

Technical attributes

Technical attributes describe the technical characteristics of the vehicle itself. Liao (2017) argued that range is found to have a positive and statistically significant effect on electric vehicle Electric vehicle adoption decisions in the vast majority of studies. Ghasri (2019) found this effect to be insignificant, which may be explained by the limited range used

in their experiment (30–60) miles. However, Helveston *et al.* (2015) found that people prefer brands from certain countries and the preference order differs between countries. Based on it the study developed the following hypothesis:

H₂: There is a positive relationship between technical attributes and consumer preferences.

Charging availability

Electric vehicle uses high-density lithium-ion batteries. Lithium-ion batteries require least maintenance, less susceptible to memory effect and require no scheduled cycling (Globisch *et al.*, 2019). The subcompact electric vehicle employ batteries with power capacity 12 – 18 kWh, mid-sized family sedans have 22 – 50 kWh batteries and luxury models (Hardman *et al.*, 2018). Batteries degrade over several charging and discharging cycles. Egbue *et al.* (2012) stated that a battery in high state of charge can lead to battery wear and calendar fade, and it was found that even aggressive use of cooling system could not offer a remedy for calendar fade in this situation. Based on it the study developed the following hypothesis:

H₃: There is a positive relationship between charging availability and consumer preferences.

Social Influence

Axsen *et al.* (2013) defined that social influence represents the degree of what a person believes that other people who their idea are important for him or her, think the same way about a new technology. In addition, social influence is suggested as an effective approach to enhance consumers' adoption of high visible, innovative, and green category products, such as smart phone (Peters *et al.*, 2014). However, the study of social influence on consumers preference for adopting alternative vehicles is still limited (Huang *et al.*, 2005). Jeon (2012) found that social influence, such as altruism and image motivations, are found to be significant in increasing consumers' purchase intention in both Korea and China, whereas different culture and economic background also have an significant effect on consumer intention. Based on it the study developed the following hypothesis:

H₄: There is a positive relationship between social influence and consumer preferences.

Environment concern

By increasing global issues, environmental concerns become more significant for purchasing decisions. Beck (2013) found that environmental attitudes and concerns play a critical role in the assignment of individuals to classes with different sensitivities to vehicle emission charges and preferences for diesel cars and hybrids. Consumers are more encouraged to accept Electric vehicle when they expect electric vehicle would reduce environmental risks (Bockarjova & Steg, 2014). Environmental factors must affect consumer behavior the acceptance of Electric vehicle (Wu, 2019). Consumers are facing new technologies which expose the consumer to risks and benefits of adoption (Paluch and Wunderlich, 2016). Lampo (2023) found that environmental concern might not be relevant to explain the intention in the BEVs domain and validates the role of technology show-off as an original measure to explain technology acceptance. Based on it the study developed the following hypothesis:

H₅: There is a positive relationship between environment concern and consumer preferences.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 128 observations. The dependent variable is (consumer preferences). The independent variables are FA (financial attributes), TA (technical attributes), CA (charging availability), SI (social influence) and EC (Environment concern).

| Variables | Mean | S. D | CP | FA | TA | CA | SI | EC |
|-----------|-------|--------|---------|----------|---------|---------|-------|----|
| CP | 3.93 | 0.6327 | 1 | | | | | |
| FA | 3.92 | 0.6621 | 0.382** | 1 | | | | |
| TA | 3.962 | 0.7678 | 0.357** | 0.386 ** | 1 | | | |
| CA | 3.952 | 0.6568 | 0.393** | 0.380** | 0.440** | 1 | | |
| SI | 3.748 | 0.6238 | 0.293** | 0.388** | 0.432** | 0.488** | 1 | |
| EC | 3.804 | 0.5798 | 0.014 | 0.200 | 0.067 | 0.063 | 0.097 | 1 |

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 1 shows that financial attributes is positively correlated with consumer preferences for electric vehicles, it means that financial attributes influence consumer preference for electric vehicles. Likewise, technical attributes are positively correlated with consumer preference for electric vehicles, it means that technical attributes influence consumer preferences for electric vehicles. Similarly, charging availability is positively correlated with consumer preferences for electric vehicles, it means that charging availability influence consumer preference for electric vehicles. Likewise, social influence is positively correlated with consumer preference for electric vehicles, it means that social influence consumer preference for electric vehicle. Moreover, environment concern are positively correlated consumer preference for electric vehicle it means that environment concern influence consumer preference for electric vehicles.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it shows the regression results of financial attributes, technical attributes, charging availability, social concern, environment concern and consumer preferences for electric vehicles in Kathmandu.

Table 2

Estimated regression result of financial attributes, technical attributes, charging availability, social influence and environment concern on consumer preference for electric vehicle in Kathmandu

The results are based on 128 observations using a linear regression model. The model $CP = \beta_0 + \beta_1 FA + \beta_2 TA + \beta_3 CA + \beta_4 SI + \beta_5 EC$, where the dependent variable is CP (Consumer preference). The independent variables are financial attributes (FA), technical attributes (TA), charging availability (CA), social influence (SI), and environment

concern (EC).

| Model | Intercept | Regression coefficients of | | | | | Adj. R _{bar} ² | SEE | F-value |
|-------|---------------------|----------------------------|--------------------|---------------------|--------------------|---------------------|------------------------------------|-------|---------|
| | | FA | TA | CA | SI | EC | | | |
| 1 | 1.868 (7.148)** | 0.565 (8.975)** | | | | | 0.391 | 0.432 | 80.85 |
| 2 | 2.129 (8.361)** | | 0.511 (8.185)** | | | | 0.347 | 0.447 | 67.00 |
| 3 | 1.949 (9.612)** | | | 0.567 (11.212)** | | | 0.501 | 0.391 | 125.72 |
| 4 | 1.983 (7.523)** | | | | 0.545 (8.461)** | | 0.363 | 0.442 | 71.582 |
| 5 | 2.0023 (8.101)** | | | | | 0.538 (8.7740)** | 0.380 | 0.436 | 76.984 |
| 6 | 1.494 (5.604)** | 0.380 (4.934)** | 0.281 (3.821)** | | | | 0.451 | 0.410 | 52.033 |
| 7 | 1.254 (5.303)** | 0.306 (4.475)** | 0.013 (0.163) | 0.412 (6.193) | | | 0.580 | 0.358 | 58.097 |
| 8 | 1.252 (5.108)** | 0.306 (4.388) | 0.012 (0.143) | 0.410 (5.268) | 0.004 (0.040) | | 0.577 | 0.360 | 43.214 |
| 9 | 1.236 (4.952)** | 0.303 (4.312)** | 0.009 (0.104)** | 0.395 (4.476)** | 0.006 (0.062) | 0.035 (0.381) | 0.574 | 0.631 | 34.354 |

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Dependent variable is consumer preference.

The regression results show that the beta coefficients for financial attributes is positive with consumer perception. It indicates that financial attributes have a positive impact on consumer perception for electric vehicle. This finding is consistent with the findings of Valeri & Danielis (2015). Likewise, the beta coefficients for technical attributes are positive with consumer perception. It indicates that technical attributes have a positive impact on consumer perception. This finding is consistent with the findings of Hoen and Koetse (2014). In addition, the beta coefficients for charging availability are positive with consumer preference for electric vehicle. It indicates that charging availability has a positive impact on consumer preference for electric vehicle. This finding is consistent with the findings of John Hall (2006). Similarly, the beta coefficients for social influence are positive with consumer perception for electric vehicle. It indicates social influence has a positive impact on consumer perception for electric vehicle. This finding is consistent with the findings of Forgas & Williams (2001). Similarly, the beta coefficients for environment concern are positive with consumer perfection for electric vehicle. It indicates that environment concern has a positive impact on consumer perfection for electric vehicle. This finding is consistent with the findings of Bockarjova & Steg (2014).

4. Summary and conclusion

Consumer preferences for electric vehicles (EVs) are undergoing a transformative shift, driven by a combination of financial, technical, and environmental factors. Financially, the Attraction of long-term cost savings, amplified by government incentives and tax credits, is influencing consumers to consider EVs as economically attractive options. Simultaneously, advancements in technology, particularly in battery efficiency and overall performance, have alleviated concerns about the practicality of electric vehicles, making them more technically competitive. The growing availability and accessibility of charging infrastructure addresses consumer apprehensions related to range anxiety, further boosting the appeal of electric vehicles.

This study attempts to examine the consumer preferences for electric vehicles in Kathmandu. The study is based on primary data of 128 respondents.

The study showed that financial attributes, technical attributes, charging availability,

social influence and environment concern have positive impact on consumer preferences for electric vehicles in Kathmandu. The study also concludes that charging availability is the most influencing factor followed by financial attributes and environment concern.

References

- Babace, S., A. Nagpure., and J. DeCarolis, 2014. How much do electric drive vehicles matter to future U.S. emissions. *Environmental Science and Technology* 6(3), 45-55.
- Kintisch, E. 2008. The greening of synfuels. *Journal of Chicago* 66(8), 90-112.
- Jorgensen, W. L., and L. L. Thomas, 2008. Perspective on free-energy perturbation calculations for chemical equilibria. *Journal of Chemical Theory and Computation* 4(6), 869-876.
- Sierzchula, W., S. Bakker, K. Maat, and B. V. Wee, 2014. The influence of financial incentives and other socio-economic factors on electric vehicle adoption. *Energy Policy* 68(34), 183-194.
- Mierlo J.V., G.P. Maggeto, K. Lataire, 2006. Which energy source for road transport in the future? A comparison of battery, hybrid and fuel cell vehicles energy conversion and management. *International Journal of Management* 47(17), 48–60.
- Wu, J., H. Liao, J. W. Wang, and T. Chen, 2019. The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China. *Transportation Research Part F: Traffic Psychology and Behavior* 60(23), 37–46.
- Wang, S., J. Li. Wang, J. Wang, J. L. Liang, 2018. Policy implications for promoting the adoption of electric vehicles: Do consumer’s knowledge, perceived risk, and financial incentive policy matter? *University of Hong Kong* 11(45), 58–69.
- Bjerkkan, K. Y., T. E. Nørbech, and M. E. Nordtomme, 2016. Incentives for promoting battery electric vehicle (BEV) adoption in Norway. *Transportation Research Part D: Transport and Environment* 43(23), 169-180.
- Harrison, G., and C. Thiel, 2017. An exploratory policy analysis of electric vehicle sales competition and sensitivity to infrastructure in Europe. *Technological Forecasting and Social Change* 11(4), 165-178.
- Muller J. M., 2019. Comparing technology acceptance for autonomous vehicles, battery electric vehicles, and car sharing—A study across Europe, China, and North America. *Sustainability* 11(16), 43-33.
- White, L. V., and N. D. Sintov, 2017. You are what you drive: Environmentalist and social innovator symbolism drives electric vehicle adoption intentions. *Transportation Research Policy and Practice* 9(9), 94-113.
- Li, W., R. Long, H. Chen, and J. Geng, 2017. A review of factors influencing consumer intentions to adopt battery electric vehicles. *Renewable and Sustainable Energy Reviews* 7(8), 318-328.
- Feng, L., K. Liu, J. Wang, K. Y. Lin, K. Zhang, and L. Zhang, 2022. Identifying Promising Technologies of Electric Vehicles from the Perspective of Market and Technical Attributes. *Energies* 15(20), 76-17.
- Higgins, C. D., M. Mohamed, and M. R. Ferguson, 2017. Size matters: How vehicle body type affects consumer preferences for electric vehicles. *Transportation Research Part A: Policy and Practice* 100(89), 182-201.

- Li, W., R. Long, H. Chen, B. Dou, F. Chen, X. Zheng, and Z. He, 2020. Public preference for electric vehicle incentive policies in China: A conjoint analysis. *International Journal of Environmental Research and Public Health* 17(1), 318-415.
- Glerum, A., L. Stankovikj, M. Thémans, and M. Bierlaire, 2014. Forecasting the demand for electric vehicles: accounting for attitudes and perceptions. *Transportation science* 48(4), 483-499.
- Mock, P., and Z. Yang, 2014. Driving electrification: A global comparison of fiscal incentive policy for electric vehicles. *International Council on Clean Transportation* 88(23), 45-90.
- Jensen, A. F., E. Cherchi, and S. L. Mabit, 2013. On the stability of preferences and attitudes before and after experiencing an electric vehicle. *Transportation Research Part D: Transport and Environment* 25(99), 24-32.
- Franke, T., and J. F. Krems, 2013. What drives range preferences in electric vehicle users? *Transport Policy*, 30(22), 56-62.
- Costa, E., P. Wells, L. Wang, and G. Costa, 2022. The electric vehicle and renewable energy: Changes in boundary conditions that enhance business model innovations. *Journal of Cleaner Production*, 333(44), 130-034.
- Bhalla, P., I. S. Ali, and A. Nazneen, 2018. A study of consumer perception and purchase intention of electric vehicles. *European Journal of Scientific Research* 149(4), 362-368.
- Adhikari M., L. P. Ghimire, Y. Kim, P. Aryal, and S. B. Khadka, 2020. Identification and analysis of barriers against electric vehicle use. *Sustainability* 12(12), 48-50.
- Pandey, A., 2019. Climate resilient pathway for developing nations: case study of electric vehicle market in Nepal. *Learning and Instruction Undergraduate Journal of Psychology* 7(88), 81-90.
- Shandilya, D., and H. N. Skotte, 2021. People Perception towards Adoption of Electric Vehicle in Kathmandu Valley. *Kathmandu University Journal* 56(4), 66-77.
- Neupane, S., 2022. Socio- technical analysis towards the adaptation of electric vehicle in Kathmandu. *Kathmandu University Journal* 78(8), 55-66.
- Krupa, A., 2019. Barriers and opportunities to electric vehicle development in Nepal. *Journal of Tribhuvan University* 88(77), 34-88.
- Rasouli, S., and H. Timmermans, 2016. Influence of social networks on latent choice of electric cars: a mixed logit specification using experimental design data. *Networks and Spatial Economics* 16(4), 99-130.
- Valeri, E., and R. Danielis, 2015. Simulating the market penetration of cars with alternative fuel powertrain technologies in Italy. *Transport Policy* 37(1), 44-56.
- Hoën, A., and M. J. Koetse, 2014. A choice experiment on alternative fuel vehicle preferences of private car owners in the Netherlands. *Transportation Research Part A: Policy and Practice* 61(23), 199-215.
- Liao, F., E. Molin, and B. van Wee, 2017. Consumer preferences for electric vehicles: a literature review. *Transport Reviews* 37(3), 252-275.
- Ghasri, M., A. Ardeshiri, and T. Rashidi, 2019. Perception towards electric vehicles and the impact on consumers' preference. *Transportation Research Part D: Transport and*

Environment, 77(5), 271-291.

- Helveston, J. P., Y. Liu, E. M. Feit, E. Fuchs, E. Klampfl, and J. J. Michalek, 2015. Will subsidies drive electric vehicle adoption? Measuring consumer preferences in the US and China. *Transportation Research Part A: Policy and Practice* 73(88), 96-112.
- Globisch, J., P. Plötz, E. Dütschke, and M. Wietschel, 2019. Consumer preferences for public charging infrastructure for electric vehicles. *Transport Policy* 81(34), 54-63.
- Hardman, S., A., Jenn, G., Tal, J., Axsen, G., Beard, N., Daina, & B. Witkamp, 2018. A review of consumer preferences of and interactions with electric vehicle charging infrastructure. *Transportation Research Part D: Transport and Environment* 62(23), 508-523.
- Egbue, O., and S. Long, 2012. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. *Energy Policy* 48(77), 717-729.
- Axsen, J., C. Orlebar, and S. Skippon 2013. Social influence and consumer preference formation for pro-environmental technology: The case of a UK workplace electric-vehicle study. *Ecological Economics* 95(44), 96-107.
- Peters, A., and E. Dütschke, 2014. How do consumers perceive electric vehicles? A comparison of German consumer groups. *Journal of Environmental Policy & Planning* 16(3), 359-377.
- Huang, Y. Z., M. J., Edwards, E., Rounis, K. P., Bhatia, and J. C. Rothwell, 2005. Theta burst stimulation of the human motor cortex. *Neuron*, 45(2), 201-206.
- Jeon, C., J. Yoo, & M. K. Choi, 2012. The effect of social influence on consumers' hybrid electric vehicles adoption in Korea and China. *14th International Conference on Advanced Communication Technology* 99(8), 336-340.
- Beck, M. J., J. M. Rose, and D. A. Hensher, 2013. Environmental attitudes and emissions charging: An example of policy implications for vehicle choice. *Transportation Research Part A: Policy and Practice*, 50(24), 171-182.
- Bockarjova, M., and L. Steg, 2014. Can Protection Motivation Theory predict pro-environmental behavior? Explaining the adoption of electric vehicles in the Netherlands. *Global Environmental Change* 28(99), 276-288.
- Wu, J., H. Liao, J. W. Wang, and T Chen, 2019. The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China. *Transportation Research Part F: Traffic Psychology and Behaviour* 60(3), 37-46.
- Paluch, S., and N. V. Wunderlich, 2016. Contrasting risk perceptions of technology-based service innovations in inter-organizational settings. *Journal of business Research* 69(7), 2424-2431.
- Lampo, A., C. Silva and P.S. Duarte, 2023. The role of environmental concern and technology show-off on electric vehicles adoption: The case of Macau. *International Journal of Emerging Markets* 23(44), 89-111.