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Perceptions towards the use of bicycles by government and public stakeholders in Tiruchirappalli district: A socio-demographic analysis

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Abstract
The perception of the bicycle as a means of transport by both the public and the government in Tiruchirappalli District, Tamil Nadu, is what has been studied here. With the focus of global efforts moving towards sustainable and equitable transport options, bicycles have been emerging as cost-effective, eco-friendly, and health-promoting substitutes for motorized transport. This study examines the impact of socio-demographic factors-income, age, residential area, and occupation-on the perception and necessity of bicycle utilization. A formal questionnaire of 56 participants was administered and resulting data were analyzed using ANOVA by SPSS 18.0. The analysis brings out the fact that residential setting and income levels greatly influence cycling habits and perceptions. Urban respondents tend to consider bicycles as a recreational or fitness device, whereas rural commuters depend on them for everyday commuting. The study emphasizes the need for focused policies and infrastructure to facilitate cycling among different demographic groups.

Keywords: Bicycle use, government perception, public perception, sustainable transport, Tiruchirappalli, socio-demographics

Introduction
In the last several decades, the demand for sustainable transport modes has gained strong traction worldwide. Urban development, increasing carbon emissions, traffic, and public health concerns have driven governments and planners to find alternatives to motorized transport. Bicycles have become an interesting solution option with several advantages along environmental, economic, and social lines. Cycling decreases dependency on fossil fuels, reduces transportation expenses, promotes cleaner air, and promotes physical activity, hence supporting both ecological preservation and community health (Pucher & Buehler, 2017; Karanikola *et al.*, 2018) [9, 5].

International policies increasingly acknowledge cycling as a key approach to sustainable development. Amsterdam, Copenhagen, and Bogotá have illustrated that cycling facilities, backed by firm public policy, can powerfully alter travel behavior and urban patterns. These cities have made investment in special bike lanes, protective regulations, and motivational programs to foster the uptake of cycling, and they have achieved greater cycling levels and lower carbon footprints (Zhou, 2015; Fishman *et al.*, 2015) [14, 15].

Conversely, in most of India, the use and perception of bicycles are still dictated by socio-economic hierarchies and cultural conditioning. Rural and semi-urban communities perceive bicycles as a utilitarian requirement—adopted for daily transport, education access, and cargo transport—whereas city residents tend to view bicycles as related to physical fitness, leisure activities, or ecological awareness. This dichotomy points to an underlying gap in perception shaped by income, access to infrastructure, and consciousness. For instance, poorer individuals might use bicycles due to financial necessity, while richer users can use them as a voluntary means of sustainable transport (Srivastava *et al.*, 2017; Uppuliri *et al.*, 2018) [11, 12].

A second important dimension is government involvement in shaping cycling behavior. Government policies—bicycle lane development, public bicycle provision, purchase subsidies, and awareness drives-have great scope to mold public attitude and utilization patterns.

However, in most places, there is very little understanding of how these policies are understood and utilized by end-users, especially in smaller cities and semi-urban areas such as Tiruchirappalli.

Tiruchirappalli (Trichy), the major central Tamil Nadu city, offers a distinct socio-geographical setting in which to examine these dynamics. The area is comprised of a mix of urban infrastructure, expanding peri-urban sprawl, and an agrarian rural majority. As such, it is an optimal location to explore the intricate interaction among socio-demographic attributes and attitudes toward bicycle use.

This research seeks to bridge the existing research gap through an examination of how different socio-demographic variables such as gender, age, income, education, and domicile affect individual opinion on the utility of bicycles and whether government interventions are effective in boosting cycling. It seeks to answer an essential research question: How do governments and members of the public view bicycles as a means of transport, and how do socio-demographic factors affect this view? By responding to this question, the research aspires to offer evidence-based suggestions for more inclusive and effective cycling policy design that appeals to various population segments.

2. Literature Review: A number of research studies have investigated the determinants of cycling behavior. Lois, Moriano, and Rondinella (2015) [6] created a model following the Theory of Planned Behavior and social identity to understand cycle commuting intention, highlighting the influence of psychological and societal predictors. Karanikola *et al.* (2018) [5] also highlighted the need for infrastructure and public policy in small cities to facilitate cycling culture.

Physical benefits that are linked with cycling are also well-documented. Oja *et al.* (2011) [8] and Andersen (2017) demonstrate that frequent cycling lowers the risk of cardiovascular disease and BMI. Likewise, Dons *et al.* (2018) [4] emphasized the positive correlation between cycling and bodily health in European cities.

Environmentally, Acheampong (2017) [3] and Srivastava *et al.* (2017) [11] maintained that bicycles facilitate the mitigation of vehicular emissions and ensure sustainable urban growth. In their research, substituting two-wheelers with bicycles in Indian cities can at least decrease greenhouse gas emission by 54%. On the industrial side, Taylor Randall (1999) [10] examined the effects of product assortment and supply chain design on the bicycle sector. He observed that strategic fit in production and marketing is important for profitability and customer satisfaction. Angela Pui-Cheung Au (2015) [2] investigated bicycle firms' use of social media marketing, illustrating how digital platforms become more important in reaching cycling communities.

In an Indian setting, Uppuliri *et al.* (2018) [12] examined the changing preference of consumers from indigenous brands such as Hero towards international brands such as B'Twin, sparked by high technology, looks, and performance.

Notwithstanding this expansive body of literature, there has been scant attention to localized public opinion regarding cycling and its connection with socio-demographic variables. The current study seeks to address this missing piece in the Tamil Nadu setting.

3. Research Methodology

Objectives

- To investigate government and public attitudes towards bicycle use in Tiruchirappalli District.
- To evaluate the correlation between socio-demographic factors and bicycle use.
- To examine the impact of government schemes on cycling behaviors.

Research Design

The study utilized a descriptive research design with a quantitative paradigm. Primary data were gathered through a structured questionnaire among bicycle users from various residential areas-urban, semi-urban, and rural-of the Tiruchirappalli district.

Sampling

A purposive sampling procedure was employed to choose 56 respondents to cover all socio-demographic segments such as gender, age, family type, qualification, profession, income, and residence.

Conceptual Framework

- Independent Variables (IVs): Gender, Age, Family Type, Education, Profession, Income, Residence
- Dependent Variables (DVs):
- Role of Government (ROG)
- Customer Perception (CUP)
- Indispensability (IND)

Hypothesis

H1: There exists a statistically significant relationship between socio-demographic variables and public perception of bicycle usage and government's perceived role.

Tools for Analysis

Data were analyzed utilizing SPSS version 18.0. ANOVA was utilized to examine the significance of correlations between variables.

Table 1: ANOVA - Residence and Role of Government

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	3.319	1	3.319	5.173	0.024
Within Groups	96.234	150	0.642		
Total	99.553	151			

Interpretation: There is a significant correlation between place of residence and the government's perceived role. Urban dwellers are more likely to accept and benefit from government-organized health and environmental campaigns utilizing cycling.

Table 2: ANOVA - Annual Income and Customer Perception

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	6.928	3	2.309	4.456	0.005
Within Groups	76.697	148	0.518		
Total	83.625	151			

Interpretation: Income is strongly related to how respondents perceive bicycle use. More affluent groups see cycling as a leisure or fitness activity, whereas the poorer communities use it as an affordable main form of transport.

5. Discussion and Conclusion: The results of the present research highlight the pervasive impact of socio-

demographic factors—especially income and location—on attitudes towards cycling and state intervention. The study yields a twofold narrative. In rural and semi-urban locations, the bicycle is a pragmatic and essential mode of transport. Bicycles in these areas are mainly employed for daily commutes to workplaces, schools, or bazaars by the respondents. This is primarily because of restricted access to motorized transport, poor public transport, and the affordability of bicycles.

On the other hand, within cities, the attitude towards bicycles is changing. Urban respondents tend to identify bicycles with fitness, lifestyle, and environmental awareness rather than transportation. This movement is an expression of wider global trends with urban populations taking greater interest in sedentary living, air quality, and the environmental cost of vehicle exhaust emissions (Dons *et al.*, 2018; Andersen, 2017) [4]. Such people are likely shaped by campaigns for health, media representation, or social behavior, which raise the prestige of cycling as a choice urban lifestyle as opposed to an economic and social imperative.

Government efforts have had a positive though limited and inconsistent effect on the public. According to the study, urban citizens are better informed and positively react to government programs like health campaigns, cycling marathons, and promotional offers. Rural areas, on the other hand, are not aware of or disconnected from these interventions. This disconnect implies that there is a requirement for local awareness campaigns and infrastructure development specific to rural settings.

One of the observations derived from the ANOVA analysis is how there is strong correspondence between income levels and customer perception. Those with greater income tend to cycle for fun, health, or recreation, and this reflects a perception gap where bicycles are not only utilitarian anymore. The lower-income respondents, on the other hand, view bicycles as practical, essential tools to facilitate the needs of daily life. These need to be the observations that guide future government policy that is inclusive and does not necessarily benefit one socio-economic class over another.

The results also indicate that the "role of government" variable is seen differently along demographic groups. While urban dwellers recognize government action in terms of better cycling infrastructure, health campaigns, or safety standards, rural and semi-urban respondents say they have minimal involvement. The role of the government must therefore extend beyond policy-making to actual implementation, grassroots-level mobilization, and coordination with local institutions in order to achieve this perceptual bridging.

The implications of this study are diverse. First, policymakers have to take the approach of segmentation. For the rural sectors, subsidized distribution of bicycles, road safety equipment (such as reflectors and helmets), and cycling lanes can make the bicycle a viable option for key transport. For the urban space, the government may encourage cycling in the form of smart city integration-such as public bike-sharing schemes, cash rewards for cyclists, and green commuter credits.

Second, behavior change communication strategies must target perception gaps. The campaigns must not only highlight health and environmental gains but also de-stigmatize the use of bicycles among lower-income groups who might opt for private vehicles out of status or comfort concerns.

Finally, more research is necessary to investigate the processes by which attitudes change over time and how peer influence, digital media, and cycling infrastructure contribute to these attitudes. Longitudinal surveys and qualitative methods (e.g., in-depth interviews, focus groups) can further contribute to a deeper understanding of the determinants and impediments of cycling in various places.

Overall, the attitude towards the use of bicycles in Tiruchirappalli captures a microcosm of larger national and international trends. Although bicycles are universally popular, the reasons and interpretations of their use differ strikingly along demographic divides. How such perceptions can be shaped by the government through inclusive and targeted interventions is key to unearthing the full potential of cycling as a healthy, sustainable, and affordable means of transport. This study lays the groundwork for such initiatives in Tamil Nadu and more widely.

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