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Determinants of Green Hydrogen Acceptance and Supply Chain Management: A Model-Based Study in Gorakhpur City, India

Avinash Rahul[1], Dr. Sonia Bhatt[2]
[1] Research Scholar, Management Studies Department, Madan Mohan Malaviya University of Technology, India.
[2] Assistant Professor, Management Studies Department, Madan Mohan Malaviya University of Technology, India.
Corresponding Author
Avinash Rahul
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ABSTRACT
India will be completely renewable by 2070 and energy independent by 2047 if hydrogen can be widely deployed as a clean fuel. However, the widespread use of hydrogen has several impediments to its successful introduction and acceptance, including its high-cost, insufficient infrastructure, and lack of public awareness about it. This thesis utilized a model-based approach to assess the various determinants of hydrogen acceptance in Gorakhpur City, including the following: 1) Economic Factors, 2) Policy Support, 3) Infrastructure Readiness, 4) Awareness, 5) Environmental Concerns, 6) Social Influences, 7) Trust, and 8) Perceived Risk. This study incorporated both the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks while using secondary quantitative survey data (n=180) and regression analysis via SPSS. The study found that only Policy Support was a statistically significant (-) predictor of hydrogen acceptance (β=-0.171, p=0.027), indicating that institutional gaps are more important than either psychological or economic barriers to acceptance. A New Hydrogen Acceptance Model was developed to include the eight determinants of acceptance, while integrating the three mediating constructs of Perceived Benefits, Perceived Risks, and as a result linking Demand-Side Hydrogen Acceptance to Supply Chain Improvement for Hydrogen Production, Storage, and Distribution. This study makes three recommendations for the phased rollout of hydrogen: 1) Awareness campaigns, 2) Open and Transparent Policies, and 3) Pilot Hydrogen Projects to increase Credibility and Enhance Large-Scale Acceptance of Hydrogen in Urban India....

Keywords: Green hydrogen, technology acceptance, supply chain management, policy support, Gorakhpur, sustainable energy, TAM, UTAUT.

INTRODUCTION

Among the many approaches to achieve meaningful reductions in carbon emissions, green hydrogen (GH_2) produced through renewable electricity-driven electrolysis is one of the most positively viewed as a "fuel of the future." In addition to supporting Sustainable Development Goal 7 (affordable and clean energy), GH_2 will serve as a base for meeting India's climate targets of energy independence by 2047 and net-zero emissions by 2070; however, literature has demonstrated that social-technical/economic barriers inhibit adoption. In particular, Martins et al. (2024), point out that "high costs and lack of infrastructure" are still significant barriers for scaling GH_2. Likewise, Trivedi et al. (2025), identify limited policy/regulatory support along with low public awareness as key barriers to growth in India. Although GH_2's benefits for the environment are well documented, achieving those espoused benefits will be dependent on the eventual resolution of social and market-related challenges.

Researchers frequently utilize the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) when studying acceptance, with these models providing insight into key factors influencing acceptance such as perceived usefulness/ease of use, social influence, and facilitating conditions. Empirical reviews indicate that the models are relevant to the energy sector - for example, Billanes and Enevoldsen (2021) identified that user's knowledge/awareness, policy incentives, social influence, self-efficacy, trust, and perceived risk have all been identified as the most significant drivers to energy technology adoption. In this vein of thought, we will conceptualize the acceptance of gaseous hydrogen (GH_2) based on three different construct categories: economic (both cost and incentives), psychological (awareness, environmental attitude, trust), and social (peer norms and institutional support). Gordon et al. (2024) argue that both domestic hydrogen acceptance and perceived benefits, perceived risks, and policy interventions collectively shape community-level factors impacting the adoption of hydrogen-based fuel-cell vehicles; this finding is consistent with studies conducted on hydrogen for mobility in India (Kar et al. 2022).

There are growing indications in the literature that six major elements are to be considered when determining whether or not to deploy hydrogen as a fuel source. These are economic costs, awareness and acceptance; policy and support from authorities; Readiness of infrastructure; environmental concerns; and, social trust. In regards to economic costs as being the most significant aspect, Gupta & Srivastava (2025) note that both the price of green hydrogen and the (average) cost of producing it will be the two most significant areas to consider, as well as both infrastructure and regulatory impediments must be taken into account. Trivedi et al. (2025) find that the lack of (adequate) subsidies and incentives, along with standards & support for R&D, are major impediments to India being able to rollout green hydrogen technology successfully. In other words, awareness and acceptance are essential for the success of hydrogen technology. Gordon et al. (2024) find that perceptions of risk, dynamics of social trust, and emotional reactions will all have an impact on how the public views the deployment of green hydrogen, and that developing links between the deployment of green hydrogen and local socio-environmental benefits will help to improve public acceptability. Furthermore, Billanes & Enevoldsen (2022) listed social trust and influence as two of the ten key factors that drive technology adoption decisions, while Herr et al (2025) demonstrated that perceived economic benefits and risks were significantly more important in influencing community acceptance of hydrogen projects. Therefore, for this model to be successful; it must include both hard barriers (cost & infrastructure) and soft factors (awareness, norms & attitudes toward risk).

The hydrogen supply chain has some unique challenges. For example, the production of GH_2 requires using renewable electricity via electrolyzers, which is costly in both capital and operational terms. In addition, the upfront infrastructure to support the production and use of GH_2 is limited given that new pipelines, storage tanks, or blending facilities will be required for GH_2 because most of the existing natural-gas network facilities are not well-suited for GH_2. Furthermore, the storage and transport of GH_2 requires a great deal of energy, and Hren et al . (2023) estimate that approximately 35% of a GH_2 supply chain's greenhouse gas footprint comes from the storage and transportation phases (e.g. liquefaction and trucking can be very expensive). By contrast, pipeline transport can dramatically reduce losses when transporting GH_2. For an urban area like Gorakhpur, the implications of this analysis necessitate the planning for both localized production (e.g. co-locating electrolyzers with solar/wind farms) and either high-pressure or cryogenic storage, along with either short-distance pipelines or truck delivery to the point of use. The unique combinations of technical logistics intersect with city-wide factors (e.g. land use, regulatory framework, demand centers) that have been understudied in the Indian literature. Notably, Peng and Bai demonstrate how cities around the globe are developing their own local hydrogen strategies and creating innovative opportunities for cities to flourish through targeted policy initiatives. Thus, Gorakhpur can add insights into city-level GH_2 systems in India that remain relatively unexplored.

2. Review of Literature

2.1 Determinants of Green Hydrogen Acceptance

The literature lists several socio-political, economic, and perceptual factors that have effect on the adoption of green hydrogen. Cho and Lee (2025) underline that the perception of the climate change among the population and the confidence in the governmental policies have a significant impact on acceptance levels. Their results show that when people consider climate change a pressing problem and have stronger trust in policy structures, they are more likely to accept the introduction of green hydrogen. Moreover, demographic factors like age, education and income also determine acceptance and therefore it is important to note how socio-economic positioning has contributed to the development of energy preferences.

In policy and institutional terms, Sambasivam and Narayana (2024) believe that national policies, like the Green Hydrogen Mission in India, are an important component in achieving acceptance. Their discussion highlights the fact that large scale targets and pilot projects provide opportunities, but there are barriers to adoption including high costs of production, low levels of indigenous technology and poor incentives. On the same note, Safronova and Barisa (2023) propose a comprehensive perspective and pinpoint technological immaturity, economic viability, and the absence of coordinated stakeholder actions as the major limitations. They emphasize the need to have a good policy support and strategic partnership between the government, industry, and academia to develop trust and speed up the acceptance.

On the grassroots level, Sharma et al. (2021) emphasize the significant role of awareness and accessibility in determining energy adoption, especially in the rural setting. Their research shows how renewable energy projects can enhance livelihoods and energy poverty, making it indirectly easier to increase the willingness to adopt new technologies such as green hydrogen. To add to this, Dixit et al. (2024) offer a multi-criteria approach, with the social factors and government intervention recognized as the most impactful determinants. Their results support the idea that the acceptability of the public, the cost, and the sound policy frameworks play the key role in scaling the green hydrogen adoption.

In general, the literature indicates that the acceptance of green hydrogen is not predetermined by one factor but the combination of awareness, policy support, economic feasibility, and social influence. Nevertheless, there is still a weakness in the aspect of incorporating these determinants in a localized context especially in the developing regions.

2.2 Supply Chain Dynamics and Infrastructure Readiness in Green Hydrogen Systems

The role of the supply chain dynamics and infrastructure preparedness in facilitating large-scale adoption is becoming an important topic in the literature about green hydrogen. As Bag et al. (2025) emphasize, the emergence of regenerative green hydrogen supply chains relies on the capacity of firms to convert the basic organizational resources into dynamic capabilities. They include effective use of resources, prevention of pollution, and stewardship of products, which improves the work of the supply chain and leads to a sustainable formation of a supply chain. The analysis highlights that in addition to technology, organizational flexibility and strategic resource management are the key elements to successful implementation of hydrogen systems.

Concentrating on upstream infrastructure decision-making, Raniskarbum and Janmontree (2024) utilize multi-criteria decision-making models, e.g., DEA and TOPSIS to optimize site selection in terms of hydrogen production. Their results show that geographic, economic, and environmental aspects play an important role in determining infrastructure efficiency, and data-driven planning is essential in building viable hydrogen production networks. In addition to this, Luukka et al. (2026) take a multi-level approach and analyze the larger socio-technical forces that influence green hydrogen supply chains. Their research outlines the main barriers on the economic, institutional, and technological levels and concludes that the issues regarding the scaling of hydrogen systems are more institutional and market-based than technical.

Continuing on the topic, Kong et al. (2026) present a maturity model of supply chain resilience and state that it is necessary to have flexible and scalable systems that can address market and regulatory uncertainties. Their results show that fragmented market structures and uncertainties in downstream demand limit upstream development and that vertical integration increases resilience and coordination. Similarly, Zhang (2025) investigates how digitalization can be used to optimize hydrogen supply chains. The effectiveness, transparency, and coordination among the stakeholders are enhanced through the integration of technologies, including IoT, blockchain, and artificial intelligence, and enhances the infrastructure preparedness.

All in all, the literature implies that the green hydrogen systems demand both the physical infrastructure and the institutional alignment, integration of digital technologies, and resilient supply chain systems. Nevertheless, there is still a great gap in comprehending the interaction between these supply-side actions and demand-side acceptance, especially in the developing countries.

3. Objective of study

a.) Determine factor affecting acceptance of green hydrogen as a fuel for sustainable development

b.) Development of green hydrogen acceptance model with reference to Indian market

4. Conceptual Framework

This study's conceptual framework is constructed to analyse how various drivers affect the adoption of green hydrogen and the effect they may have on supply chain management beyond simply the city of Gorakhpur. The framework is based on established theories of technology acceptance, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), combining these theories to identify essential drivers that can be categorised as economic, social, psychological, or infrastructure-related. According to the model, the economic aspects like costs and financial incentives, along with supportive policies and institutions and available infrastructure, are the main external influences on the decision to adopt green hydrogen technology. Additionally, individuals' awareness of the technology, concern for the environment, social pressure, and trust and risk assessment are primary psychological and social motivators that affect how people feel about using green hydrogen.

Fig. 1 Conceptual framework

The combined efforts of these factors play an important role in influencing user perceptions of the relative advantages and disadvantages, etc., as they will serve as mediators in the model. However, when users believe that green hydrogen has more advantages and less risk associated with it, they are more likely to accept it.

The framework further develops beyond just being a tool for the adoption / acceptance of green hydrogen by linking the acceptance of green hydrogen with the supply chain management process used in the production, storage, transport, and distribution of green hydrogen by allowing a higher acceptance of green hydrogen to facilitate the creation of better and more capable production methods for producing green hydrogen and/or building better storage, transporting systems, etc.

The conceptual framework is designed to develop a more complete view of the acceptance of green hydrogen by linking acceptance factors from the demand-side with strategic planning on the supply-side, thus providing an overall view that is beneficial to both the relevant policymakers, industry representatives, and urban planners who wish to encourage greater acceptance of green hydrogen in developing countries, such as India, etc.

5. Research Methodology

5.1. Research Design

The current research utilizes a quantitative and descriptive research design that aims to investigate the potential impacts on supply chain management in Gorakhpur City with regard to the acceptance of green hydrogen, and to identify key determinants affecting the success of this emerging form of energy. A model-based approach will be used to explore the relationships and influences between several key independent variables that may affect the acceptance of green hydrogen - these include economic factors, policy support, infrastructure readiness, awareness, environmental concern, social influence, trust, and risk perception. The study will also employ theoretical frameworks based on existing literature, namely Technology Acceptance Model (TAM) and

Unified Theory of Acceptance and Use of Technology (UTAUT); these are two commonly cited approaches to studying technology adoption behavior. The quantitative (model-based) research design allows for systematic data collection and statistical analysis of the data, which allows for testing hypotheses and validation of the conceptual model. The use of a descriptive approach allows for determining the current perceptions, awareness levels and attitudes that respondents have regarding the adoption of green hydrogen.

5.2. Data Collection

Both primary and secondary information are used to provide a complete view of the research question. The primary information is gathered using a standardised survey developed specifically to gather information on how respondents view, know and feel about green hydrogen. The survey consists of closed-ended questions which are rated on a Likert scale providing the opportunity for the researcher to have uniformity in the data and ease of analysis. The respondents are located in Gorakhpur city and consist of students, businesspeople, and academics. The secondary information is sourced from reliable material, such as research journals, governmental reports, policy documents, and other literature related to green hydrogen and renewables. This enables the researcher to identify key variables that form part of the theoretical basis for this research. By integrating both primary and secondary data, the results of this study are more reliable and can be said to be valid.

5.3. Sampling Technique

Due to practical issues related to time constraints and ease of accessing respondents, a non-probability convenience sampling approach was used in this study. The target population is made up of people living in Gorakhpur city who have at least basic knowledge or understanding of renewable energy concepts. There are a total of approximately 180 respondents included in this study to provide enough data for statistical analysis. This sample consists of students, working professionals and academics to ensure that the sample contains individuals with different viewpoints about acceptance of green hydrogen. While the use of convenience sampling can limit the generalizability of the results obtained using this type of sampling, this kind of sampling method is appropriate for exploratory research and studies focusing on perceptions. Respondents from different demographic groups are included to ensure a comprehensive and balanced view regarding the attitudes toward green hydrogen and the supply chain development of green hydrogen.

5.4. Data Analysis Tools and Techniques

SPSS (Statistical Package for the Social Sciences) software analyzes the collected data for testing the hypotheses and validating the conceptual model. Descriptive statistics are used to summarize the demographic characteristics and general responses of respondents, including mean, frequency, and percentage. Reliability and internal consistency of the measurement scale will be determined using Cronbach's Alpha. In addition to the above statistical analyses, correlation analysis will help determine the relationship between independent variables and acceptance of green hydrogen. Multiple linear regression analysis will also be used to assess the effects of multiple determinants on the dependent variable (acceptance of green hydrogen). The above statistical analyses provide a systematic evaluation of the proposed relationships and allow for developing substantive conclusions about the factors that influence green hydrogen adoption and the implications of the adoption of green hydrogen for supply chain management.

5. Ethical Considerations

To ensure the study has credibility and integrity, ethical principles are adhered to throughout the research process. Respondents are told about the purpose of the survey and know that they are participating in a study voluntarily. Informed consent is obtained from all participants who agree voluntarily to participate. There is a guarantee that all responses will be kept confidential or anonymous and that no personally identifiable information will ever be disclosed or used for any reason beyond the original study. The data collected will never be shared outside of the study for any other uses other than for academic purposes. Additionally, there are no biases or manipulation present in the data or data collection process; there will never be any misrepresentation of collected data. When using any secondary sources, proper citations will be made to ensure academic integrity and adhere to ethical research guidelines.

6. Result and Analysis

Objective 1 : Determine factor affecting acceptance of green hydrogen as a fuel for sustainable development

Table 6.1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.212[a]	.045	.000	1.435
a. Predictors: (Constant), Risk Perception, Environmental Concern, Infrastructure Readiness, Social Influence, Trust, Policy Support, Awareness, Economic Factor				

In Gorakhpur, Green Hydrogen acceptance was predicted using a proposed regression model whose results indicate that it has relatively low explanatory power. The R value is .212 which indicates weak correlation with the independent variable(s). Additionally, the R value of .045 indicates that only 4.5% of the variance in Green Hydrogen acceptance is accounted for by the independent variable(s): economic factors, policy support, infrastructure readiness, awareness, environmental concern, social influence, trust, and risk perception. Additionally, the Adjusted R value of .000 indicates that when adjusting for the number of independent variables, the current model does not provide significant added value to explanations of the dependent variable. This suggests that additional variables or alternative approaches may need to be applied to fully capture the determinants of Green Hydrogen acceptance; thus, current modeling attempts at providing a predictive ability will be very limited.

Table 6.2 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.612	8	2.076	1.009	.431[b]
	Residual	351.938	171	2.058		
	Total	368.550	179			
a. Dependent Variable: GH Acceptance						
b. Predictors: (Constant), Risk Perception, Environmental Concern, Infrastructure Readiness, Social Influence, Trust, Policy Support, Awareness, Economic Factor						

The ANOVA analysis indicates how well the regression model fits the data and if the coefficients are statistically significant. Based on an F-value of 1.009 and significance level of 0.431 ($p = 0.431$), the model does not statistically fit at the 5% level ($p > 0.05$). Therefore, the combined effect of the independent variables (economic factors, policy support, infrastructure readiness, consumer awareness, environmental concern, social influence, trust, and risk perception) does not provide a statistically significant explanation of variations in green hydrogen acceptance. There is also a significant difference between the residual sum of squares and the regression sum of squares; the large residual sum of squares indicates there are a large number of explanations for the variance not captured by the model. The findings by the model summary demonstrate that there is little predictive capability in only using the variables selected to predict green hydrogen acceptance. In conclusion, further research is needed on the factors influencing consumer behaviour regarding acceptance as well as modifying the modelling approach.

Table 6.3 Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.663	.646		5.674	.000
	Economic Factor	-.006	.076	-.007	-.085	.933
	Policy Support	-.172	.077	-.171	-2.234	.027
	Infrastructure Readiness	-.031	.079	-.030	-.394	.694
	Awareness	-.053	.077	-.052	-.681	.497
	Environmental Concern	.016	.076	.016	.213	.832
	Social Influence	-.034	.078	-.033	-.432	.666
	Trust	.104	.075	.106	1.384	.168
	Risk Perception	-.031	.077	-.031	-.409	.683
a. Dependent Variable: GH Acceptance						

The coefficients table provides a breakdown of how well each of the independent variables can predict acceptance of green hydrogen for the residents living in Gorakhpur. Policy support was the only independent variable with a statistically significant impact on acceptance of green hydrogen (β = -0.171, p = 0.027). Therefore, there is evidence that policy support is important in influencing acceptance of green hydrogen in Gorakhpur. However, the negative coefficient suggests respondents may view current policy support as insufficient or ineffective, which may result in lower levels of acceptance. All other independent variables related to economic factors, infrastructure readiness, awareness of green hydrogen, environmental concern, social influence, trust, and risk perception were not statistically significant ($p > 0.05$), meaning that there is no direct impact from these variables on acceptance of green hydrogen at this time based on the current model used. Trust showed a higher positive beta value ($\beta = 0.106$) compared to other variables but still was not considered significant; therefore, it is not likely to contribute to overall acceptance.

Therefore, the results indicate that institutional variables (especially policy support) are more important than either socio-economic or psychological variables in determining acceptance of green hydrogen at this time.

Objective 2 : Development of green hydrogen acceptance model with reference to Indian market

The current research forms the foundation to understand how individuals view adopting green hydrogen in India. To accomplish this objective, a new Green Hydrogen Acceptance Model has been designed based on pre-existing theoretical frameworks for technology acceptance such as TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology), along with other social, economic and infrastructure characteristics specific to developing countries.

In addition, the proposed model looks at four types of constructs (economic, institutional, social, and psychological) so that they can provide a comprehensive understanding of how to determine the variables affecting the different factors related to acceptance of green hydrogen.

Components of the Model

Independent Variables (Determinants)

The model has the subsequent major determinants:

Economic Factors: Indicate economic considerations, affordability, and financial incentives related to the adoption of green hydrogen.

Policy Support: Denotes governmental initiatives, subsidies, and regulatory frameworks that promote adoption.

Infrastructure Readiness: Denotes the accessibility of production, storage, and distribution infrastructure.

Awareness: Assesses the extent of public understanding of green hydrogen technologies.

Environmental Concern: Indicates individuals' awareness of environmental sustainability and climate change.

Social Influence: Denotes the impact of peers, media, and society standards on adoption behavior.

Trust: Signifies faith in governmental policies, technological dependability, and institutional frameworks.

These variables collectively signify external factors that affect individual perceptions and decision-making.

Mediating Variables

The model includes two essential mediators:

Perceived Benefit (+) : Denotes the degree to which persons perceive green hydrogen as offering economic, environmental, and societal benefits. It enhances acceptance.

Perceived Risk (–) : Represents apprehensions related to safety, financial unpredictability, technological advancement, and infrastructural constraints. It adversely affects acceptance.

These mediators encapsulate the cognitive evaluation process, serving as a conduit between environmental factors and behavioural results.

Dependent Variable

• **Green Hydrogen Acceptance:** Denotes the readiness and intention of individuals to embrace green hydrogen as a sustainable fuel source.

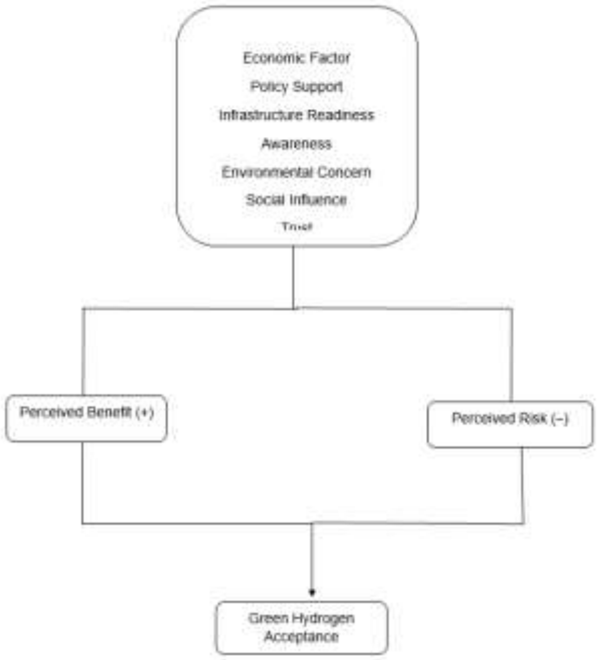

Fig . green hydrogen acceptance model

Empirical Validation of the Model

Using regression and mediation analysis, this model was empirically validated. The results of this study show that:

Perceived benefits positively impact the acceptance of "green hydrogen".

Perceived risks negatively impact the acceptance of "green hydrogen".

Several independent variables have both direct and indirect effects, supporting the existence of partial mediation.

These results support the importance of perception-based variables in influencing adoption behaviour.

Relevance to the Indian Context

India provides a rich context for the proposed model due to the following realities:

High consumer price sensitivity

High reliance on government policy and support

Limited available infrastructure

Varying levels of public awareness and trust

The key findings identified indicate that institutions and social/economic considerations provide greater influence over acceptance in India than just the technology itself.

7. Discussion

The current research contributes valuable evidence concerning what's involved in people's readiness to accept green hydrogen and thereby determines how to facilitate supply chain management in Gorakhpur through increased Green Hydrogen adoption/implementation. The findings of the regression analysis show that there is not enough information available to support any of the independent variables included in this research develop a model that statistically predicts acceptance of Green Hydrogen ($p > 0.05$). This might be an indication that the overall level of awareness concerning green hydrogen is very low and that many participants in the study do not have much experience with or exposure to green hydrogen applications.

There are four individual variables tested in the regression analyses with policy support being the only variable found to produce a statistically significant correlation with Green Hydrogen acceptance (although the coefficient was negative). This may indicate either poor perceptions of policy support by the respondents or that respondents do not fully trust in government policies to support them in adopting or implementing Green Hydrogen. All other independent variables tested including economic conditions, awareness, infrastructure readiness and concern for the environment, all developed an insignificant relationship to the dependent variable. Research in the past did show that all of these independent variables were important to support people's readiness to adopt or implement Green Hydrogen. The difference in the current study is that acceptance and readiness to adopt Green Hydrogen in emerging market contexts (such as Gorakhpur) may be affected by limited technological experiences and promotional gaps that make perceived associations between the independent variables and dependent variable weaker than expected.

In summary, there is much to learn about how we perceive an accepted model. However, there are still a lot of unknowns about what will ultimately lead to the acceptance of a product or service. Therefore, while there are variables within this model (like perceived benefit or perceived risk), the primary purpose of these variables is to illustrate the process of acceptance as it continues to evolve.

As such, to develop a green hydrogen supply chain for Gorakhpur, planners must take a careful and phased approach. They must focus on creating awareness, building trust through policy transparency and pilot projects, and using public perception as a key driver for acceptance. Ultimately, while there is great opportunity for green hydrogen, accepted usage and supply chain development of this new energy source will largely hinge on support from institutions and public perceptions during the early stages.

8. Conclusion

This investigation sought to analyse the drivers of acceptance for green hydrogen and investigate their ramifications for Gorakhpur's supply chain management in relation to the overall energy transition. The results indicate that green hydrogen is acknowledged as a viable alternative to traditional forms of energy; however, there is limited acceptance locally, influenced by various contextual factors.

Empirical analysis indicates that the overall explanatory model for green hydrogen acceptance has very low statistical significance, thus demonstrating that traditional determinants of acceptance in relation to green hydrogen (economically viable, knowledge of green hydrogen, infrastructure readiness and environmental concern) currently do not have significant effect on the level of acceptance. Of these factors, policy support is recognised as being a significant determinant of acceptance, and highlights the importance of government action in influencing behaviour associated with the adoption of green hydrogen. Nevertheless, the negative association indicates that policy measures which are perceived to be more effective, transparent and build trust will be more likely to result in increased acceptance of green hydrogen.

This research also supports the conceptual development of an acceptance model for renewable energy by combining constructs that mediate between perceived risk and perceived benefit. Although these factors have been shown to be theoretically significant; the empirical evidence supporting these conclusions is changing and reflects that green hydrogen is still in its infancy, as evidenced by the current state of adoption within India.

The research suggests that there should be a staged approach to the development of a green hydrogen supply chain in Gorakhpur, with a critical emphasis placed on building supporting infrastructure; creating awareness; developing institutional support; and piloting projects. Ultimately, improvements in three areas; namely: public perception; effectiveness of policies; and levels of engagement from stakeholders, are necessary for a transition to green hydrogen to occur successfully...

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