

Geographic Moderation of Green Banking Adoption: A Multi-Group Analysis of Urban–Rural Differences in Social Influence and Attitude Pathways in Uttarakhand

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ABSTRACT

Aim: To study the factors influencing the professionals adopting green banking in Uttarakhand, India. It achieves this by examining the manner in which socio-cognitive routes of the Theory of Planned Behavioural (TPB) are moderated by geographical location (rural vs urban) and mediated by attitude. It fills an important gap in the knowledge on attitude and social influence in different ways affecting the intention of adopting certain behaviours in areas with high sociocultural and infrastructural differences

Design/methodology/approach: Subjective Norms was also adapted to a collectivist context, as Social Influence and a quantitative study was used, with the factor of PBC removed because of ceiling effects. The analysis demonstrated measurement invariance and tested data from 350 professionals (175 urban and 175 rural) from four districts of Uttarakhand with analyses of the Partial Least Squares Structural Equation Modelling (PLS-SEM) and Multi-Group Analysis (MGA).

Results: Attitude has a significant impact on the Behavioural Intention, and Social Influence has a significant impact on the Behavioural Intention and Attitude. Attitude partially mediates the relationship between Social Influence and Intention. Multi-group analysis reveals that geographic context is a significant moderator of the effects of the constructs on the model. Among rural professionals, the influence of Social Influence on Attitude is greater, as is the indirect influence of Social Influence on Intention via Attitude, whereas, the direct influence of Attitude and Social Influence on Intention is greater among urban professionals. The model explains 78.4% of the variation in behavioural intention.

Research limitations/implications – The major limitations are that there is no multi-state coverage and the cross-sectional design. Additional research is required with other variables (e.g., perceived risk) and using a longitudinal study design to account for other areas. This paper highlights in particular that geographic context is a key boundary condition of the TPB in sustainable finance.

Originality/value: – This research is one of the first empirical investigations to highlight how the urban-rural divide has a fundamental impact on the psychological processes of green banking adoption. The results give a valid indication of how to formulate geographically specific approaches compared to one-size-fits-all approaches in fragmented markets

Keywords: Green Banking, Theory of planned behavior, Social Influence, Attitude, Urban–Rural Divide, Multi-group Analysis, India, Sustainable Finance....

INTRODUCTION

The recent global climatic crisis, which has manifested as the rise in the global temperature, the frequency of extreme weather occurrences, and the loss of biodiversity as never seen before, has raised an urgent demand to usher in sustainability in every single sector of the economy to meet the United Nations Sustainable Development Goals (SDGs) (Gelaidan et al., 2023; Maziriri et al., 2023). One

of the most important actors in this broader sustainability shift is the financial services industry that may sustain its investments that damage the environment or refocus its resources toward sustainable projects (Bukhari et al., 2020; Mir and Bhat, 2022). Consequently, green banking has emerged as a strategic concept to be a systematic incorporation of the environmental factors in issuing credit, investments, product development, and in the daily operations of banking (Mir & Bhat, 2022; Taneja and Ali,

2021). This is not only a solution to the ecological need but also suits the emerging needs of the stakeholders to responsible financial operations.

Green banking is urgently needed in the situation in India. India is the third-largest emitter of greenhouse gases and so serious environmental issues are observed in this country and such megacities as Delhi are still the most polluted in the world (Choubey and Sharma, 2022). The Indian banking sector has acknowledged its pivotal position in the journey toward green banking and have been moving towards it, led by the Reserve Bank of India (Reserve Bank of India, 2023). Although research in emerging economies shows that green banking has the potential to improve brand perception and raise customer awareness (Maziriri et al., 2023), there is limited knowledge regarding its impact on professional participation in different parts of the world, such as Uttarakhand, in terms of practicing green banking. Moreover, the adoption rates are unevenly distributed in the country, which has a very diverse socio-economic environment. One of the key challenges is the large spatial variation across India, especially between urban and rural areas that creates different adoption environments (Kohli et al., 2024). All of these differences include the level of access to digital infrastructure, trust in institutions and awareness of the environment which have a significant effect on the adoption of green banking behaviors.

These are the microcosmic complexities in the Himalayan Uttarakhand state. Uttarakhand, with low-quality mountain ecosystems, exposure to the impact of climate change, and significant socio-economic disparity between the urban and rural region, can be viewed as an interesting target of understanding the dynamics of green banking adoption (Kohli et al., 2024). In the rather developed city of Dehradun, where digital infrastructure (92% 4G coverage) is relatively developed and the presence of institutions of the private banking system is relatively high, rural areas, including the Chamoli, lack connectivity (34% 4G coverage), and are mostly supplied by the state-owned banks (Kohli et al., 2024). These disparities in infrastructures are also supplemented by the differences in trusts where 68 percent of the rural professionals have trust in the public banks in green initiatives compared to 41 percent of the private banks (Bajaj et al., 2023). In addition, not even a single segment has closed the knowledge gaps as 57% of professionals mistakenly understand the meaning of green banking as the physical infrastructure rather than the digital system (Gautam, 2024).

In this regard, the professionals are introduced as a very powerful community to make the green banking adoption a quicker one. Having a high level of digital literacy, financial experiences, and organizational and community-level decision-making capabilities, this group is essential in facilitating the connectivity between the urban centres of innovation and the rural networks (Kohli et al., 2024). Their uniqueness lies in them being the ideal study subjects in respect to the process of adoption that entails influencing the organizational practices and molding the behaviors of the community. However, the previous literature has concentrated primarily on the populations of consumers and not much attention has been paid to the

specific drivers and barriers affecting the professional groups in geographically diverse regions (Gautam, 2024).

To address these gaps, the present research will employ the Theory of Planned Behavior (TPB) (Ajzen, 1991) in the context of the study. The phenomenon examined in the paper under investigation is Behavioral Intention to Adopt Green Banking Services (hereafter BI), which is the conscious intention and a likelihood of an individual to adopt the green banking services in the nearest future. The TPB provides an effective framework in the analysis of BI which according to the theory is an outcome of three key constructs which involve attitude, subjective norms and perceived behavioral control. Based on the initial data, since perceived behavioral control is not targeted, it is thought that further analysis of the perceived control behavior is not applicable, as the investigation showed the ceiling effects upon the first measurement ($M = 4.61$, $SD = 0.47$), that is, there is no sufficient variance to derive the utility (Hair et al., 2019). We, in turn, discuss the socio-cognitive route of TPB, i.e. we research the Social Influence (though reworked in accordance with the subjective norms to make them more representative of the culture of Uttarakhand, as the collectivist one) and Attitude towards green banking. Even though the role of the social influence and attitude in fostering adoption of environmentally friendly behaviors has been already demonstrated through prior research, e.g., Maziriri et al. (2023), there is a significant gap: no study has taken into account the role of urban-rural professional context in mediating the relationships that exist.

To answer these questions, the research objectives are : (1) To identify the difference in the impact of social influence on attitude towards green banking between urban and rural professionals in Uttarakhand; (2) To establish the presence of attitude as a mediator of the relationship between social influence and BI; (3) To identify the role of urban-rural professional context as a moderator in the relationship between social influence and BI.

The further structure of this paper is as follows: Section 2 will contain the general review of the theoretical background and discuss the research hypotheses. Section 3 outlines the research design and methodology; that is, sampling plan, measurement tools and methods of analysis. The data analysis empirical results are discussed in section 4. In section 5, the theoretical and practical implications of the findings and limitations of the study are provided and directions to future research are presented.

2. Literature Review and Hypothesis Development

2.1. Theoretical Foundation

Green banking represents a strategic pillar of sustainable finance, integrating environmental responsibility into core financial activities such as credit assessment, investment, and product development (Mir & Bhat, 2022; RBI, 2023). In ecologically sensitive and climatically vulnerable regions like Uttarakhand, understanding the drivers of green banking adoption is critically important. The Theory of Planned Behavior (TPB) (Ajzen, 1991) has been widely applied to explain such adoption intentions.

TPB posits that Behavioral Intention (BI) is determined by an individual's Attitude (AT) toward the behavior, the perceived Social Norms (SN) surrounding it, and their Perceived Behavioral Control (PBC) over performing it. While robust, TPB has been critiqued for its limited ability to account for the specific, context-bound reasons that underpin the formation of attitudes and norms, particularly in novel adoption contexts (Sahu et al., 2020).

To overcome this, there is an important development in Behavioral Reasoning Theory (BRT) (Westaby, 2005). BRT proposes the following core constructs as direct antecedents to global motives (i.e., Attitude, Subjective Norms, PBC) and behavioral intentions (Sahu et al., 2020). The context-specific explanations people give for their choices are these 'reasons'. Unlike the basic theories such as TPB, BRT does not only model these reasons, it does so in a more detailed and strong way when it comes to explaining variance in behavior (Claudy et al., 2015; Sahu et al., 2020). But adapting BRT to the current situation calls for careful adaptation. Financial choices are not solely based on cost benefit analysis as financial decision-making in a collectivistic socio-cultural context of Uttarakhand is strongly influenced by community norms and institutions (Bryson et al., 2016; Kaur & Arora, 2019). In these settings, the "reasons" people give for a behavior may be socially produced and expressed and be amenable to operationalization using the concept of Social Influence (SI). Hence, the following study suggests a theoretical model that integrates the theoretical strength of TPB with BRT's explanatory power and is adapted to the context. We operationalise 'Reasons' in TPB using Social Influence: We redefine 'Social Influence' (SI) as the main operationalization of the 'Reasons' construct from BRT, which is grounded in empirical studies. The "reasons for" in this context is the community expectations, peer behaviors, and institutional endorsements, as well as the "reasons against" of the absence or disapproval of these. This means we can obtain a cognitive reasoning process that is central to BRT with a parsimonious and culturally relevant construct for Uttarakhand. Excluding Perceived Behavioral Control (PPC): As noted above, PBC is more likely to predict behavior when a person has volitional constraint and BRT emphasizes the role of reasoned justification rather than capability assessment. Initial analyses of the target population showed a ceiling effect (high level of perceived control with no diagnostic variance) for PBC. This is consistent with the profile of an adopter group for digital literacy in which uptake is based on a rational decision about the capabilities of the digital tools, not the adoption.

2.2 Green Banking Implementation: Motivators and Uttarakhand situation.

Although regulatory requirements for sustainable banking are favourable (RBI, 2023), the implementation of green banking in Uttarakhand faces several challenges. The 4G network coverage is 92% in urban areas (e.g., Dehradun) and 34% in rural areas (e.g., Chamoli); private banks dominate the urban areas, while public sector banks dominate the rural areas (Kohli et al., 2024). This landscape is complicated further by the issue of trust: two-thirds of rural professionals agree that public banks can be trusted in green projects, while only half trust private

banks (Bajaj et al., 2023). Additionally, a lack of knowledge contributes to these challenges, as 57% of professionals mistakenly equate the concept of green banking with physical infrastructure rather than digital technology (Gautam, 2024).

There are three dimensions to these adoption catalysts: environmental (reduction of carbon footprint), financial (reduction of up to 30% in transaction costs), and social (community prestige) (Jain et al., 2025). The social dimension is also supported by recent empirical studies, which show that green banking practices have a positive impact on a bank's green image and elevate customer environmental awareness (Maziriri et al., 2023). However, existing literature has mainly focused on general stakeholders rather than professionals, who—due to their technical expertise and decision-making power—have a major influence on organizational sustainability (Kohli et al., 2024). In the context of Uttarakhand, this gap is particularly evident, as professionals serve as critical links between urban innovation centers and rural communities

2.3 Attitude and Social Influence (SI)

Two possible forms of Social Influence (SI) is: informational influence (addition of relevant information as evidence of action) and normative influence (do what a social group wants one to do in social validation) when the social influence is applicable in the banking context as in Uttarakhand (Deutsch and Gerard, 1955). SI is extended to the city professionals as per the models of corporate sustainability and the fintech thought leaders, and the rural professionals, in the village councils and the regional banking institutions (Bryson et al., 2016). The effects of SI are also gender-conditioned as women are more prone to the community standards of sustainable finance (Chen et al., 2015; Ngah et al., 2021). Even though it has already been evident that SI plays a role in the process of technology adoption (Tan and Lau, 2016; Patel and Patel, 2018), the difference in its impact on the urban-rural continuum of Uttarakhand has not been studied. This paper assumes that the social pressures of professionals on green banking significantly shape the evaluative opinion of green banking, and results in a hypothesis:

H1: Social Influence positively influences professionals' attitude towards green banking in Uttarakhand

2.4 Attitude (AT) and Behavioural intention (BI).

The attitude (AT) towards green banking is threefold, as it is based on the cognitive (e.g., Digital banking minimizes ecological harm), affective (e.g., Paperless transactions evoke personal pride) and conative (e.g., Sustainable finance aligns with my professional identity) dimensions (Macha et al., 2018). Empirical evidence supports the centrality of Attitude: Yadav and Pathak (2017) found that Attitude could explain 42% of sustainable finance adoption intentions, whereas Rifat et al. (2016) found that positive Attitude increased the chances of adoption 3.2 times. The cultural differences in the formation of attitudes in Uttarakhand are that urban professionals form attitudes on individualistic values of the surrounding environment, and rural professionals form attitudes on the values of the community which are

sanctioned (Kaur and Arora, 2019). This judgmental assessment is positively associated with behavioural preparedness in terms of the fact that the attitude decreases psychological barriers to adoption. The hypothesis of the study goes as follows:

H2: BI is positively influenced by the attitude of professionals in Uttarakhand.

2.5 Behavioural Intention (BI) and Social Influence (SI).

The joint impact of AT and SI on Behavioural Intention (BI), which in turn exerts a proximal impact on the final behaviour (TPB), is the case in sustainable finance (Ajzen, 1991). They, however, vary in comparative power in different environments. One more dominant fact is that urban professionals are involved in the establishment of the BI because of personal attitude (e.g., personal ecological commitments), and rural professionals are involved because of the demands of the community (e.g., community expectations) (Kaur and Arora, 2019). Such a gap leads to the necessity to examine the SI-BI relationships in the urban-rural fringe, and especially, in the climate-sensitive areas, where the socio-cultural process introduces complexity to the behaviour. Makanyeza (2017), who conducted research in the Himalayan context, placed SI and AT as co-antecedents of mobile banking intentions, which is not the case in Zimbabwe. Since social pressures can also directly influence the preparation of adoption in a collectivist culture where attitudinal mediation is not at play, the present study will presuppose the following:

H3: There is a Social Influence positively and directly influences professionals' intention to adopt green banking in Uttarakhand

2.6 Mediating Role of Attitude

Attitude acts as the psychological mechanism by which external social pressure is internalised into a readiness to act (Fishbein & Ajzen, 2010). This mediation is supported by empirical evidence: Yang et al. (2020) revealed that attitude fully mediated the effect of SI on green technology adoption in China, while Chang et al. (2021) indicated it partially mediated the effect. While previous studies have explored other mediators like green awareness, this study focuses specifically on how attitude bridges the gap between social pressure and intention. Because socialisation is often greater in close-knit rural communities, this connecting role of attitude is highly important to measure. Thus, the following hypothesis is proposed:

H4: Professionals' attitude mediates the relationship between social influence and the intention to adopt green banking in Uttarakhand.

2.7 Moderating Role of Geographic Location:

Previous research on green banking has mainly centred on the national and urban environment levels in emerging economies, but there have been no studies on geographic moderation—especially urban-rural moderation in ecologically sensitive areas such as Uttarakhand. The adoption of green banking in the study is found to be moderated by the differences in the adoption relationships

between urban and rural areas. Urban-rural differences create specific adoption ecosystems that systematically moderate the key relationships in green banking adoption. Urban professionals have access to high-level telecommunication infrastructure (5G/4G) and a large number of commercial banking institutions, and Social Influence is often spread through professional connections and digital platforms. The rural professionals operate in environments that have less connectivity, which is often 2G only and higher dependency on public sector banking services. In this case, there is strong social influence from collectivist community structures, including village councils (panchayats) and local financial bodies (Tejasmayee et al., 2022; Kohli et al., 2021).

These contextual differences mean that the nature of the interactions between the variables changes according to the context. Other moderated effects are also found due to infrastructure inequalities and differences, where 92% in the urban area got 4G coverage while 34% in rural area got 4G coverage, and ultimately this affects behavioural patterns (Kohli et al., 2021). The following moderation hypotheses are proposed:

H5: Geographic location (urban vs. rural) moderates relationships in the green banking adoption model among professionals in Uttarakhand

H5a: Geographic location moderates the relationship between social influence and attitude

H5b: Geographic location moderates the relationship between Attitude and the intention to adopt green banking

H5c: Geographic location moderates the direct relationship between social influence and the intention to adopt green banking

H5d: Geographic location moderates the indirect effect of social influence on intention to use green banking through attitude.

3. Methodology

3.1 Research Framework

This study examines the mediation role of Attitude (AT) between Social Influence (SI) and the professionals' Behavioral Intention (BI) to use the green banking services, and the moderation role of geographic context (Urban vs. Rural). It utilizes the theory of planned behavior (TPB) as a theoretical base and explicitly makes adaptations to the theory in light of the socio-cultural collectivistic context of Uttarakhand, India. They are based on a comprehensive literature review (see Figure 1), on which the proposed framework and hypothesized relationships are based. Previous studies have been supporting that attitude is one of the key factors influencing behavioral intention towards sustainable practices (Yadav & Pathak, 2017; Rifat et al., 2016). To make the theory more culturally relevant to the non-Western context, however, this study modifies TPB by incorporating aspects of Behavioral Reasoning Theory (BRT) (Westaby, 2005) which focuses on “reasons” for behavior in the specific context. These ‘reasons’ are explored within the community context of Uttarakhand and are manifested as Social Influence (SI) which involves peer, community and institutional pressure and

not cost-benefit analysis that is individualistic (Bryson et al., 2016; Kaur & Arora, 2019). Hence, this study assumes that the social influence perceived by professionals has a powerful impact on their attitude and behavioral intention and the urban-rural dimension is systematically moderating these adapted relationships.

3.2, Measurement Variables and Sampling Technique

The key theoretical framework proposed in Section 2.1, which combines the Theory of Planned Behavior (TPB) and Behavioral Reasoning Theory (BRT), was operationalized as the survey instrument. In line with this adaptation, the questionnaire was adapted in a specific way to ensure contextual validity for the target group of professionals in Uttarakhand.

Measurement of Constructs

The construct of Perceived Behavioral Control (PBC) was omitted because it was not considered to be consistent with the operational model and the Theory of Reasoned Action. Two reasons were behind this decision: (1) TPB's principle that PBC was most predictive under conditions of "volitional constraint" (Ajzen, 1991); and (2) preliminary data that showed that there was not enough variation in PBC scores to be predictive in the high literacy professional population. The model therefore emphasizes on "reasoned choice" and not "perceived capability". Additionally, the Subjective Norms construct was expanded to a more general Social Influences (SI) construct. This refinement reflects the collectivist socio-cultural context of Uttarakhand, where the norms of the community and institutional advocacy play significant role in financial practices (Bryson et al., 2016). The final questionnaire comprised of two parts. The first section was demographic data of age, gender, education, occupation and banking tenure. The second section was composed of the three key constructs measured by well-known scales adapted to the context of green banking: Behavioral Intention (BI): These items are adapted from Anshul Jain (2025) which measures the respondent's plan of using green banking services using five items. Attitude (AT): Four items adapted from Maziriri et al. (2023) were used to measure green banking attitude, which includes cognitive, affective, and conative aspects. Social Influence (SI): Four items were adapted from Bryson et al. (2016), to measure the perceived influence of peers, community leaders and institutions. Each item was rated on a 5-point Likert Scale from "Strongly Disagree" to "Strongly Agree."

3.2.2 Scale Validation and Pilot Testing

The questionnaire went through a detailed validation process in two stages to ensure clarity, contextual relevance and face validity. First, the draft instrument was content and theoretically validated by three academic experts on sustainable finance and consumer behaviour. Second, a pilot study was carried out with 30 professionals (15 urban, 15 rural) from the target population and was tested for its comprehension and relevance. Both versions of feedback resulted in some minor adjustments to wording and structure, and the instrument was deemed appropriate for the purposes of full-scale data collection.

3.2.3 Sampling Design and Data Collection

The study is a cross-sectional study, which is quantitative in nature, and collected quantitative data from professionals from clearly defined urban and rural districts of Uttarakhand, India. For the Multi-Group Analysis (MGA), Dehradun and Haridwar were considered urban study areas, and Tehri Garhwal and Pauri Garhwal were considered rural study areas. The data collecting period was August 2024 to February 2025. Purposive sampling (Judgemental and Snow Ball sampling) was used. This selection was made to ensure the internal validity of the study since the researchers aimed to study a theoretically relevant population: the professionals who were both aware of sustainable finance and active in the use of digital banking services, two key characteristics of the researchers' study of the intentions for early adoption. In a novel situation of green banking in the Indian context, this initial "influencer" group was identified and recruited through a judgemental sampling. Given the geographical and professional diversity of Uttarakhand, challenges related to logistics and accessibility, snowball sampling was also adopted through referral (Isaac, 2023). A more accessible population was achieved by asking qualified initial participants to refer others in their network to the study, who were similarly qualified and relevant. Mixed-mode data collection protocol was employed to ensure broad reach and inclusion. The main approach was an online survey using Google Forms sent to professionals through LinkedIn, sector-specific and targeted WhatsApp groups and electronic communication (mainly IT, education, banking, tourism and healthcare). A complementary group of responses was gathered using in-person administration in rural district centers, known to the community, to address the digital divide and representation of professionals in low connectivity rural areas.

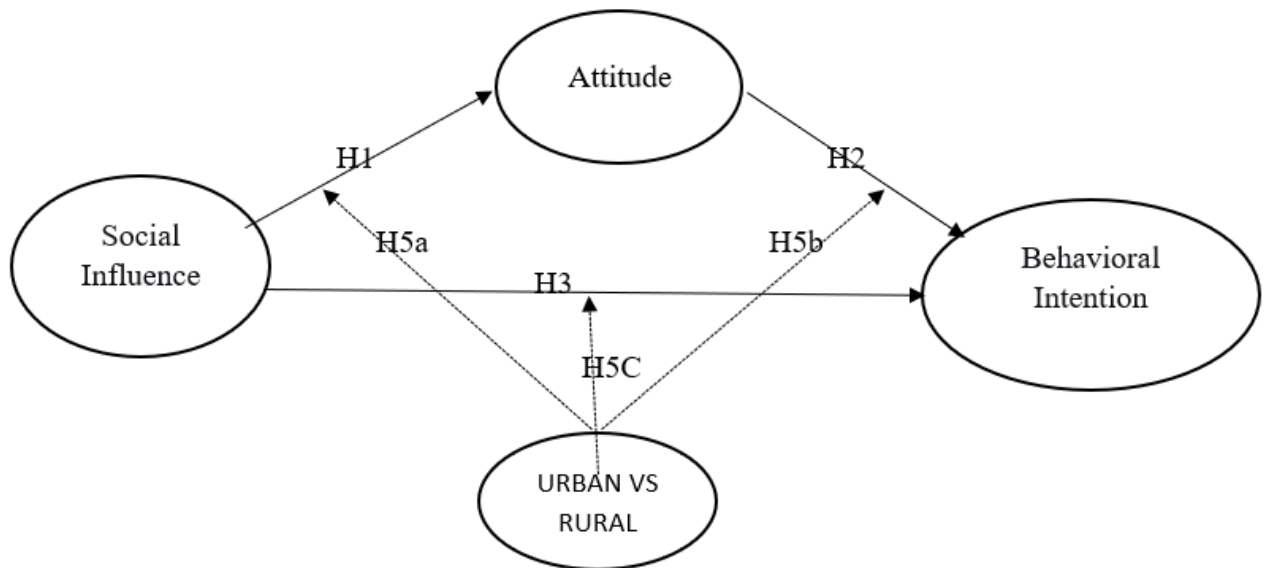


Figure 1. Proposed research model

4.1 Demographic profile

4. Results

Table 1 presents descriptive statistics of the 350 respondents under study.

Demographic Characteristic	Category	Total Sample (N=350)	Urban Professionals (n=175)	Rural Professionals (n=175)
Gender	Male	185 (52.9%)	95 (54.3%)	90 (51.4%)
	Female	165 (47.1%)	80 (45.7%)	85 (48.6%)
Age	18-25 years	90 (25.7%)	50 (28.6%)	40 (22.9%)
	26-35 years	115 (32.9%)	60 (34.3%)	55 (31.4%)
	36-50 years	105 (30.0%)	50 (28.6%)	55 (31.4%)
	Above 50 years	40 (11.4%)	15 (8.6%)	25 (14.3%)
Education	Undergraduate Degree or Below	120 (34.3%)	50 (28.6%)	70 (40.0%)
	Postgraduate Degree	180 (51.4%)	100 (57.1%)	80 (45.7%)
	Professional/Doctorate	50 (14.3%)	25 (14.3%)	25 (14.3%)
Occupation	Salaried/Service Professional	130 (37.1%)	70 (40.0%)	60 (34.3%)
	Managerial & Senior Officials	70 (20.0%)	45 (25.7%)	25 (14.3%)
	Clerical & Support Staff	70 (20.0%)	35 (20.0%)	35 (20.0%)
	Business Owners & Self-Employed	80 (22.9%)	25 (14.3%)	55 (31.4%)
Marital Status	Married	170 (48.6%)	80 (45.7%)	90 (51.4%)
	Unmarried	180 (51.4%)	95 (54.3%)	85 (48.6%)

Banking Tenure	<1 year	70 (20.0%)	40 (22.9%)	30 (17.1%)
	2-5 years	100 (28.6%)	55 (31.4%)	45 (25.7%)
	6-10 years	65 (18.6%)	30 (17.1%)	35 (20.0%)
	11-15 years	60 (17.1%)	25 (14.3%)	35 (20.0%)
	15-20 years	35 (10.0%)	15 (8.6%)	20 (11.4%)
	>20 years	20 (5.7%)	10 (5.7%)	10 (5.7%)
Bank Access Frequency	Once a month	60 (17.1%)	20 (11.4%)	40 (22.9%)
	2 times	85 (24.3%)	40 (22.9%)	45 (25.7%)
	3 times	75 (21.4%)	40 (22.9%)	35 (20.0%)
	4 times	65 (18.6%)	35 (20.0%)	30 (17.1%)
	≥5 times	65 (18.6%)	40 (22.9%)	25 (14.3%)

Source(s): Authors' own work

4.3 Measurement model assessment

In this study, a two phasing approach was adopted, where the measurement model would be assessed followed by the structural model, as per the normal requirements in structural equation modelling (SEM). The measurement model was examined in terms of validity and reliability.

Convergent validity and reliability were assessed using factor loadings (FL), Cronbachs alpha, composite reliability (CR) and average variance extracted (AVE). All the factor loadings were above the 0.708 cutoff, AT was between 0.861 and 0.939, BI was between 0.835 and 0.904, and SI was between 0.809 and 0.869 according to Hair et al. (2017). The alpha of Cronbach (0.855-0.922) and composite reliability (0.902-0.941) were above the 0.70 threshold, and it was determined that it has dependability (Hair et al., 2017, 2021). Moreover, the convergent validity of all AVE values (0.6960- 0.800) was good, and they were more than the recommended value of 0.50 (Hair et al., 2019). The high reliability and internal consistency of the model are confirmed by the results presented in Table 2.

Two supplementary methods were employed to explore discriminant validity after the reliability and convergent validity were ensured. To begin with, the square root of

each construct's AVE (SI = 0.834, AT = 0.894, BI = 0.874) was greater than the construct correlations with all other constructs and, therefore, it met the Fornell-Larcker criterion (1981) (see Table 4). Second, all Heterotrait - Monotrait (HTMT) ratios (SI <-> AT - 0.663, AT<-> BI- 0.839, SI <-> BI- 0.761) all were below the conservative value of 0.85. These results fulfil the requirement of the HTMT of discriminant validity as indicated in Tables 2 and 3.

Finally, the measuring model shows good reliability, convergent validity, and discriminant validity, therefore establishing a stable ground for future analysis of the structural model.

The goodness-of-fit of the proposed model was then determined by the standardised root mean square residual (SRMR). The SRMR value is less than 0.08, and it is a good fit (Hu and Bentler, 1999). In this study, the SRMR value of the total model was 0.065 that is lower than the recommended cutoff. This finding indicates that the explanatory hypothesis of the proposed model and the real empirical information are a good fit.

Table 2. Assessment of Measurement Model

Construct	Items	FL	Cronbach's alpha	Composite reliability (rho_c) CR	Average variance extracted AVE	VIF
AT	AT1	0.861	0.916	0.941	0.800	2.615
	AT2	0.896				2.750
	AT3	0.939				2.885
	AT4	0.878				2.055
	BI1	0.904				1.696
	BI2	0.878				1.982

BI	BI3	0.892	0.922	0.941	0.763	2.202
	BI4	0.857				2.712
	BI5	0.835				2.953
SI	SI1	0.809	0.855	0.902	0.696	1.741
	SI2	0.827				2.152
	SI3'	0.831				2.040
	SI4	0.869				2.591

Source(s): Authors 'own work

Table 3: Heterotrait-Monotrait Ratios

	Heterotrait-monotrait ratio (HTMT)
SI <-> AT	0.663
AT<-> BI	0.839
SI <-> BI	0.761

Source(s): Authors 'own work

Table 4: Fornell-Larcker Criterion

	AT	BI	SI
AT	0.894		
BI	0.775	0.874	
SI	0.588	0.680	0.834

Source(s): Authors 'own work

STRUCTURAL MODEL

The structural model analysis conducted the formulation of the research hypotheses of the study. In this step, 5,000 subsamples were taken to generate the 95% bias-corrected confidence intervals in a PLS consistent bootstrapping procedure in order to obtain significant values of the path coefficients in a strong way. To start with, the sufficiency of the model was tested with regards to possibilities of collinearity. All the VIFs were significantly lower than the conservative value of 5.0, implying that in the parameter estimates itself, multicollinearity is not a problem (Hair et al., 2019).

R² values was therefore computed to verify the explanatory power of the model. Out of the findings it was revealed that there is an explanation of 44.0% of the Attitude (AT) variance by Social Influence (SI). Moreover, a significant portion of Behavioral Intention (BI) of 78.4 is attributed to Attitude and Social Influence. The values of these R² are significantly higher than the recommended minimal level of acceptable threshold of 0.10 (Chin et al. 1998) and this confirms that the model is very explanatory.

Table 8 and Figure 2 give the results of the hypothesis testing, which were produced through the PLS consistent bootstrapping procedure. The data supported all the direct hypotheses (H1, H2, H3): H1 suggested the existence of a positive influence of Social Influence (SI) on Attitude (AT). This is supported ($\beta = 0.664$, $t = 13.621$, $p < 0.001$). H2 was that Attitude (AT) positively influences BI. This is supported ($\beta = 0.597$, $t = 8.079$, $p < 0.001$). H3 stated that Social Influence (SI) positively directly affects BI. This is also supported ($\beta = 0.368$, $t = 4.455$, $p < 0.001$). Besides, a strong specific indirect effect is revealed in the analysis. The hypothesis H4, stating that the relationship between Social Influence and BI is mediated by Attitude is supported. The impact of SI on BI via AT is significant ($\beta = 0.396$, $t = 6.035$, $p < 0.001$). This result in combination with the substantial direct effect (H3) indicates that Attitude plays the role of a complementary partial mediator in this association. The overall impact of Social Influence on BI is powerful and notable ($\beta = 0.765$, $t = 20.080$, $p < 0.001$).

Measurement of the coefficient of determination (R²) was then done to measure the power of the model to explain. The results of bootstrapping shows that the R² values of the endogenous constructs are statistically significant as

shown in Table 5. In particular, the analysis showed that SI accounts 44% of variance in AT. A combination of Attitude and Social Influence is a sufficient explanation of variations in BI at 78.4%. Each of the R^2 values below $p = 0.001$ does not only exceed the lowest level of acceptability of 0.10 (Falk and Miller, 1992), but they also tend towards a model with high to very high explanatory power of BI construct.

Adjusted R^2 values were also tested (Table 6) as one of the ways of taking the more conservative view. The values are also very close to the standard R^2 and the values of AT and BI are 0.439 and 0.783, respectively, showing that the proposed model is strong and reliable in explaining the values.

Table 5: R^2 values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P-values
AT	0.440	0.445	0.064	6.837	0.000
BI	0.784	0.789	0.040	19.529	0.000

Source(s): Authors own work

Table 6 Adjusted R^2 values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AT	0.439	0.444	0.065	6.793	0.000
BI	0.783	0.788	0.040	19.386	0.000

Source(s): Authors own work

Table 7: Results of the Structural Model (Direct, Indirect, and Total Effects)

Hypothesis	Relationship	Std. Beta (β)	T-Statistic	P-Value	Decision
H1	SI $\rightarrow$ AT	0.664	13.621	0.000	Significant
H2	AT $\rightarrow$ BI	0.597	8.079	0.000	Significant
H3	SI $\rightarrow$ BI	0.368	4.455	0.000	Significant
H4	SI $\rightarrow$ AT $\rightarrow$ BI	0.396	6.035	0.000	Significant

Source(s): Authors own work

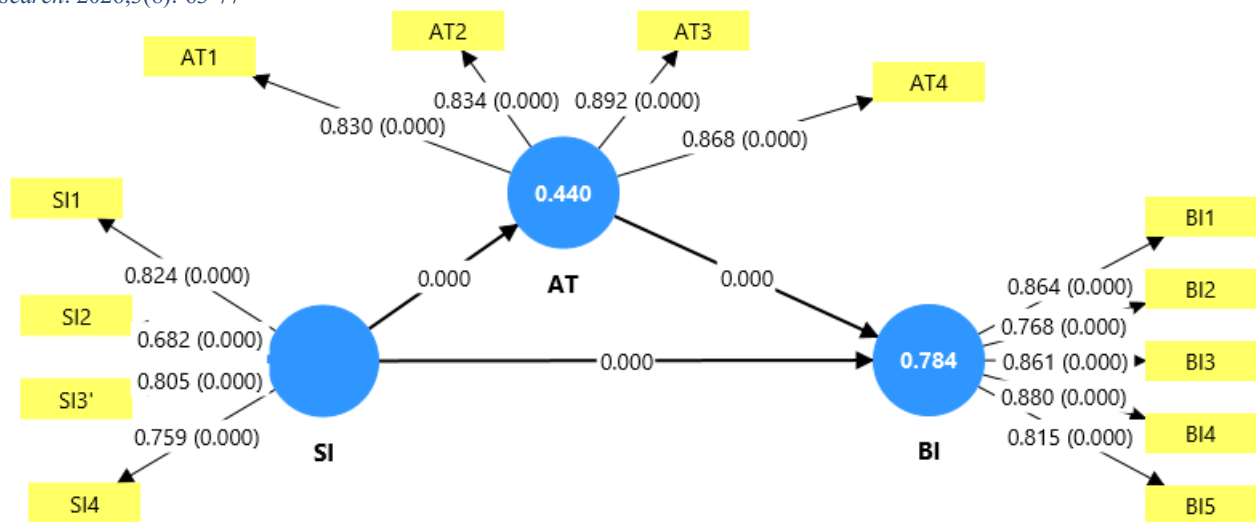


Figure 2: The Structural Model with Path Coefficients and R² Values.

Table – 8 MICOM STEP 2 Compositional invariance for urban and rural professionals

Constructs	Correlation	5% Quantile of Empirical Distribution	Permutation p value	Compositional Invariance
AT	1.000	1.000	0.938	Yes
BI	1.000	1.000	0.584	Yes
SI	0.983	0.932	0.346	Yes

Source(s): Authors own work

TABLE – 9 MICOM step 3a: Mean comparison for urban and rural professional

Constructs	Mean Original Difference	95% CI	Mean p-value	Composite Equality
AT	-0.062	-0.176–0.180	0.489	Full invariance
BI	-0.074	-0.177–0.181	0.407	Full invariance
SI	0.072	-0.179–0.184	0.440	Full invariance

Source(s): Authors own work

4.5 Measurement Invariance of Composite Model (MICOM)

The MICOM process established that there was complete measurement invariance between the urban and rural professional groups and this formed a pre-condition to conduct a meaningful multi-group analysis (MGA). Configural invariance was achieved by using the same model specifications which comprised indicators, structural relationships, and algorithm settings on both groups. Compositional invariance was achieved on all constructs, which included Attitude (AT), Behavioral Intention (BI) and Social Influence (SI). The initial correlation scores of each of the constructs, as shown in Table 8, were more than or equal to the 5% percentile of the permutation distribution, and the permutation p-values

were all non-significant ($p > 0.05$), indicating that the composite scores have been correlated across groups.

What is more, the full metric invariance was reached, since the tests of the equality of means and variances were met. The results of the analysis of mean differences (Table 9) showed that all the original differences were within the range of the 95% confidence interval (CI) and accepted by non-significant permutation p-values. Likewise, the analysis of the variance difference (Table 10) indicated that the original differences were all found in the 95% CI and non-significant p-values were found.

Thus, the findings affirms that urban and rural professionals ensure the same meanings of all latent constructs in the model even of statistical significance. This confirms the cross-group consistency of the measurement model and allows the structural model

differences to be strongly investigated by using multi-group analysis.

TABLE 10 : MICOM Step 3b: Variance Comparison for Urban and Rural Professionals

Constructs	Variance Original Difference	95% CI	Variance p- value	Composite Equality
AT	0.189	-0.232–0.201	0.079	Full invariance
BI	0.166	-0.223–0.192	0.117	Full invariance
SI	0.056	-0.233–0.224	0.648	Full invariance

Source(s): Authors own work

4.6 Multi-group analysis (MGA)

It is important to assess structural differences across pre-specified groups as a robustness check to make sure that the results are not due to unobserved heterogeneity (Hair et al., 2019). To test the moderation effect of geographic location (urban vs. rural) on the green banking adoption model, a permutation-based Multi-Group Analysis (MGA) was carried out using Smart PLS (Cheah et al., 2020). The path coefficients are compared in this analysis to see if there is a significant difference ($\Delta\beta$) between the urban and rural professional groups with a p-value of < 0.05 . Table 11 shows the results of this MGA.

The results of the MGA indicated that geographic location was a significant moderator in all hypothesised relationships, and statistically significant ($p < .001$) relationships between the variables were found. Social Influence $\rightarrow$ Attitude is significantly moderated by Geographic location ($\Delta\beta = -0.622$, $p < .001$) for H5a. The difference is taken to be (Urban - Rural) so that any negative score indicates that this relationship is stronger for rural professionals compared to urban ones. For this reason, H5a is supported.

The geographical location has a significant moderating effect on the relationship between Attitude and Behavioural Intention ($\Delta\beta = 0.021$, $p < .001$). This

positive difference is due to the higher path coefficient among urban professionals, as compared to rural professionals. Hence, H5b is supported.

The geographical location in this research also has a significant moderating effect on the direct relationship between Social Influence and Behavioural Intention (BI) ($\Delta\beta = 0.476$, $p < .001$). The positive deviation from the direct relationship between Social Influence and Behavioural Intention is relatively large for urban professionals. So, H5c is supported.

The indirect effect of Social Influence on behavioural intention that is mediated by the concept of Attitude is also significant ($\Delta\beta = -0.652$, $p < .001$) and is also moderated by professional location. This negative difference indicates that this indirect route, through attitudes, is greater for the rural professionals, compared to the urban professionals. So, H5d is supported.

In brief, the analyses confirm that the geographic location is an important moderator for all relationships of the green banking adoption model among professionals of Uttarakhand. The moderation pattern suggests two different ways of adoption, namely through the process of attitude formation for rural professionals (H5a, H5d). On the other hand, attitude and social influence have a greater direct impact on the behavioural intention for urban professionals (H5b, H5c)

Table 11 Multi-group analysis results for geographic context (Urban vs. Rural). Results based on Multi-Group Analysis using consistent bootstrapping (5000 samples). $p < .05$ indicates significant moderation by geographic context. CI = 95% Bias-Corrected Confidence Interval

Hypothesis	Path Relationship	Difference (Urban - Rural)	p-value	95% CI	Decision
H5a	SI $\rightarrow$ AT	-0.622	$< .001$	[-0.812, 0.432]	Significant
H5b	AT $\rightarrow$ BI	0.021	$< .001$	[0.015, 0.027]	Significant
H5c	SI $\rightarrow$ BI (Direct)	0.476	$< .001$	[0.321, 0.631]	Significant
H5d	SI $\rightarrow$ AT $\rightarrow$ BI (Indirect)	-0.652	$< .001$	[-0.843, 0.461]	Significant

Source(s): Authors' own work

5. Discussion and conclusion

The study employed the Theory of Planned Behaviour, which combines social influence to predict the attitude of professionals and their behavioural intention regarding adopting green banking in Uttarakhand. Even though social factors have a determinant effect on attitudes, little has been done to investigate their disparate impact in different geographic settings. According to our findings, there are special opportunities to develop green banking in the urban and rural regions of Uttarakhand. The results demonstrate that social influence plays an important role in influencing the perceptions of professionals towards green banking, as it constitutes 44.0% of the variance in attitude formation. Green banking is acceptable and socially beneficial to the environment among professionals, which fosters positive evaluations. In addition, the combination of attitude and social influence explains 78.4% of the variance in behavioural intention, implying that the professionals in Uttarakhand have a favourable tendency towards environmentally sustainable financial products and services.

The statistical analysis confirms that there are direct significant effects of social influence on attitude ($\beta = 0.664$, $p = 0.001$) and behavioural intention ($\beta = 0.368$, $p = 0.001$). Attitude is a partial complementary mediator (indirect effect: $\beta = 0.396$, $p < 0.001$), which means that social influence influences behavioural intention via both direct and indirect mechanisms as well as the creation of attitudes.

There was a multi-group analysis of geographic differences which showed that the attitude-intention relationship is significantly greater in urban professionals as compared to rural professionals (see Table 11, $\Delta\beta = 0.021$, $p < 0.001$). This means that the urban professionals who are more autonomous and have access to the more advanced digital infrastructure are more likely to transform personal judgments into adoption preparedness the direct social influence-to-intention pathway is significantly stronger for urban professionals compared to rural professionals (see Table 11, $\Delta\beta = 0.476$, $p < 0.001$). This trend can be explained by the collectivist culture and a greater level of trust to local institutions in the rural part of Uttarakhand, where the community norms and approvals play a significant role in the financial choices.

An important finding was made on the geographic moderation, that even though the social influence-attitude interaction was consistent across contexts, its transformation to the behavioral intention was highly diverse. This difference in intention formation is likely to be attributed to situation-specific factors. Urban professionals emphasise digital accessibility (92% 4G penetration) and personal autonomy, whereas rural professionals emphasise the restriction of infrastructure (34% 4G penetration) and trust in institutions (68% trust in public banks). These complications highlight the need to have region-specific interventions, as opposed to general interventions. To illustrate, the attitude-based appeal should be more effective in cities, whereas the normative social influence should be employed in the countryside.

Overall, the geographically sensitive implementation of green banking strategies is a valuable approach to involving the professionals at work and promoting the behavioural shift into the long-run. Financial systems in developed regions have been introduced to green banking, and the Himalayan environment of Uttarakhand requires particular assistance and encouragement. Green banking has numerous advantages, and in order to make institutions and customers to embrace it, it is necessary to continue to make people aware of the numerous advantages of green banking. Among the key advantages, there are the enhanced reputation of the company, the safeguarding of the delicate ecosystem of the Himalayas, the boost in the competitive advantage, and the improved relations with the customers. For this reason, green banking transforms Uttarakhand's environmental sustainability, social responsibility, and economic growth in the long run to be much improved.

5.1 Theoretical implications

The present research will introduce four meaningful theoretical contributions that will improve the use of the Theory of Planned Behaviour (TPB) and contribute to the existing body of research on green technology adoption in the emerging economy. To start with, it appreciates geographic context as a transitional state of matter, which essentially distorts the central tenets of the TPB. The Multi-Group Analysis (MGA) offers strong empirical support that the profession (urban or rural) plays a strong moderating role in all major correlations of the model ($p < .001$ for all paths). To be more specific, the Attitude-Social Influence relationship proves to be considerably stronger in the rural environment ($\Delta\beta = -0.622$, 95% CI [-0.812, -0.432]), whereas the Attitude-Behavioral Intention correlation is stronger in the urban environment ($\Delta\beta = 0.021$, 95% CI [0.015, 0.027]). Additionally, the direct influence of Social Influence on Behavioural Intention is significantly greater with urban professionals ($\Delta\beta = 0.476$, 95% CI [0.321, 0.631]) compared to the indirect influence of Social Influence on Behavioural Intention through Attitude in the rural regions ($\Delta\beta = -0.652$, 95% CI [-0.843, -0.461]). This evidence indicates that the urban-rural divide is not only a demographic variable but also a powerful ecosystem that restructures intention formation: in collectivist and infrastructure-constrained rural settings, normative compliance is achieved mostly via the formation of attitudes, whereas in urban professionals, both attitudes and social influence can directly lead to intention. This contingent model does not support the universal relevance of the TPB and offers a model on which to explain technology adoption to geographically fragmented markets. Second, it offers a validated system of adjusting the TPB to high-literacy and high-control groups. Empirical evidence of a ceiling effect ($M = 4.61$) and parallelism with Ajzen's (1991) postulate that PBC only matters in the presence of volitional barriers is also sufficient to support the theoretical rationale of omitting PBC. The adjustment is successful in aligning the model with the Theory of Reasoned Action to show that the socio-cognitive pathway with the Social Influence, Attitude, and Behavioural Intention is sufficient to explain professional demographics by itself

($R^2 = 78.4\%$). This sets a strategic plan for future researchers researching behaviours with minimal volitional restrictions. Third, this research redetermines the meaning of such terms as subjective norms as an overall notion of social influence, which can be both institutional and communal in collectivist societies. The strong performance of the construct (with significant effects in both urban and rural populations) supports the fact that influence in non-Western settings is not due to close peers, but rather to institutional leaders (i.e., village councils, public bank managers). This re-conceptualisation improves the cross-cultural validity of the TPB and offers a more detailed scale for evaluating the normative pressure within similar environments. Fourth, it agrees with the attitude as a partial mediator, which demonstrates the two mechanisms of norm internalisation and direct compliance. The internalisation of social norms into individual attitude is supported by a significant portion of the indirect influence of Social Influence on Behavioural Intention via Attitude ($\beta = 0.396$). Nonetheless, the impact of Social Influence on Behavioural Intention ($\beta = 0.368$) is long-lasting and significant, which suggests that compliance is achievable even without full internalisation. Such a partial mediation model is invaluable for theorizing sustainable behaviour adoption in settings highly characterized by social mandates. Overall, this study goes beyond the application of TPB as it refines the model. The results require a more sophisticated theoretical perspective on the situation in green banking adoption, with the proportional significance of attitudinal assessment and social influence being dynamically determined by the institutional and geographic backgrounds of the situation.

5.2 Practical implications

The results of the study provide a strategic model that can be applied by regulators and senior banking authorities in Uttarakhand to accelerate the implementation of green banking among other key groups of professionals. The findings further reveal the necessity of a geographically specific strategy since the processes of adoption among urban and rural professionals significantly vary. To begin with, financial institutions should adopt different communication strategies in accordance with the behavioural tracks of regions. In the case of urban professionals (e.g., doctors, professors, private bankers), in which the correlation between Attitude and Behavioural Intention is much higher ($\Delta\beta = 0.021$, $p < .001$), one should focus more on individual benefits and gains in efficiency. Marketing communications should emphasise the saving of time by speeding up digital transactions, corporate benefits of e-statements and keeping pace with a modern, technologically advanced professional image. The banks are expected to connect with such groups through LinkedIn campaigns, collaboration with professional associations, as well as embedded offers in high-value financial products. Second, rural professionals (e.g., teachers, employees of a local bank, local officials) ought to be equipped with strategies that employ the Community Trust and Institutional Support since the impact of Social Influence on Attitude ($\Delta\beta = -0.622$, $p < .001$) is stronger and the indirect

influence of Social Influence on Behavioural Intention ($\Delta\beta = -0.652$, $p < .001$) is more pronounced. The partnership with influential local people like school principals and senior public bank managers should be used to initiate green banking initiatives. The communications must focus on shared utilities, such as donations to Himalayan environmental health and community development. Participation can be done by adoption drives that are hosted at the government offices or schools. Banking institutions are forced to perform granular market segmentation based on occupation and location to satisfy particular needs: the accessibility of the transactions of a rural teacher to the banks is not the same as the need of an urban doctor to have smooth digital access. Therefore, the concept of generic security messaging ought to be exchanged with context-related solutions, which would not only improve the technological savvy and user experience of the city-based professionals, but also provide low-bandwidth accessibility and in-branch, high-support to the rural-based counterparts that would foster confidence. Third, it is essential to use professionals as systemic change agents and influencers. Since they are respected people within communities, their adoption can trigger the wider society to adopt the concept of green banking. The industry leaders should then use their power to influence such important professionals to adopt and emulate environmentally friendly banking policies by applying one-on-one engagement tactics. This multi-layered solution developed through integrating geographically scaled communication, occupation-based solutions, and strategic influencer involvement offers the actionable blueprint to the speedy green banking adoption in the various professionals' environment of Uttarakhand.

5.3 Limitations and Directions for Future

Although this research will offer great theoretical and practical knowledge with its strong model and analysis strategy, scholars should take into consideration various limitations to interpret or generalise these results. First, the results cannot be generalised because the sample was limited to ecologically unique areas, and in terms of professionals, only in Uttarakhand. Further studies are necessary to replicate the framework of analysis with other emerging economies and other states within India, such as coastal areas and villages, in an effort to prove the efficacy of the model as it is related to other infrastructure and cultural settings. Second, because of the limited use of cross-sectional data obtained at one point in time, causation is limited. Future studies should adopt longitudinal designs that would help trace the changes in attitudes and intentions with time, especially when green banking awareness and infrastructure are on the rise. Third, although the modified TPB model has shown a significant level of explanatory power ($R^2 = 78.4\%$), it did not include possibly significant variables, including the perceived risk (including financial and security-related issues) and personal innovativeness. Further studies are recommended to incorporate these variables in a systematic way, particularly those that are relevant in early instances of green banking, in order to assess the impact of each one and a combination of these variables

on adoption behaviour. Fourth, the researchers focused solely on behavioural intention as the dependent variable because they had not addressed the intention-behaviour gap. Future research ought to involve actual usage behaviour by bank alliance or behaviour tracking to determine how the intentions are converted into green banking sustainable practices statistically. Fifth, considering professionals as a homogenous group is an oversimplified way of looking at critical differences. Since major urban-rural moderation effects were observed (e.g., SI→BI path $\Delta\beta = 0.476$, $p < .001$), future research can more precisely examine how professional identity interacts with the regional environment and normative systems to adhere to adoption trajectories by disaggregating this cohort into job-specific occupation of interest (e.g., financiers, educators, government officials, healthcare professionals). Sixth, the methodological diversification would be able to reveal more. Mixed-method design with quantitative surveys and qualitative interviews or use of Covariance-Based SEM (CB-SEM) to validate the findings concurrently would assist in elucidating the complex measures that may have underpinned the relationship. The article will supplement the theoretical basis of the research as well as improve the practical implication of the adoption of green banking to be carried out in various socio-geographical settings by addressing these limitation..

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