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Beyond Income and Education: Unveiling the True Catalysts of Green Behavior in Pakistan and South Asia

A Demand-Side Analysis

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Abstract

There is extensive literature on the progress of green alternatives in Pakistan, but there is no evaluation of how the people of Pakistan will respond to these proposed solutions. After conducting a literature review on green alternatives, this paper employs the Theory of Planned Behavior (TPB) framework. It utilizes data from the World Values Survey (WVS) in conjunction with logistic regression to assess the viability of sustainable practices in Pakistan and whether specific demographic groups, such as women, highly educated individuals, and high-income citizens, exhibit a greater inclination to adopt sustainable practices. Our regression analysis indicates that people's income, religiosity level, and age do not affect their likelihood of adopting sustainable practices. In contrast, their attitude towards free market ideology, self-provision, and cultural values such as power distance and global connectedness have a significant impact. The paper shows Pakistan's education system does not instill environmental values in people like other South Asian systems. Women in South Asia are less likely to adopt sustainable practices than men. These findings offer valuable insights for policymakers and financial institutions, guiding a nuanced restructuring of green alternative approaches in Pakistan and South Asia.

<u>Keywords</u>: Green alternatives Pakistan, Sustainable practices adoption, Gender sustainability gap, South Asian sustainability, Sociodemographic factors, Environmental values

Introduction

The impact of climate change will vary across South Asia, a vast region with diverse climates. Northwestern India and some parts of Pakistan are high and arid. The Maldives are threatened by rising sea levels. The Hindu Kush Himalaya region, which spans several South Asian countries, is subject to melting glaciers. Other areas are tropical zones vulnerable to recurring cyclones (Hijioka et al., 2014). Due to its high population density, significant poverty, and population centers in coastal areas, South Asia is vulnerable to rising sea levels and harsh weather conditions (Siddiqui & Hossain, 2020).

By 2050, under a carbon-intensive scenario in which there is no decarbonization of energy systems, per capita income is projected to decline by 6.7% in Bangladesh, 2.8% in India, and 7% in Sri Lanka (Mani et al., 2018). All South Asian countries must curb emissions (Tzung, 2022), though India stands out as a particularly significant contributor to carbon emissions in South Asia due to its large population (Menon, 2022). Research shows Pakistan faces an acute threat from climate change, with floods alone causing a national loss of \$30 billion U.S. dollars (Qamer et al., 2022). Moreover, fluctuating weather patterns are bringing about privation of crop yields and 20-30% of livestock, aggravating communities' food poverty, and making Pakistan the 8th most vulnerable country to climate change despite being responsible for only 0.9% of global greenhouse gas (GHG) emissions (Ishaque et al., 2022).

Against this backdrop, green alternatives and sustainable practices, such as adopting green products and implementing electric vehicles become paramount. Green financing is another factor, defined as any practice that increases financial flows such as banking, investment, microcredit, and insurance from the private, not-for-profit, and public sectors towards sustainable development (UNEP, 2016, p. 5). Since it is not thoroughly researched in the literature and requires a bigger commitment on the part of individuals than other green alternatives, the last instrument takes more of the spotlight in this paper than other green alternatives. Green financing solutions (GFS) are instruments for channeling green finance. This includes promoting green loans and bonds through public-private partnerships and supporting the government in fostering an enabling environment. GFS, more so than other green alternatives, requires collaboration from both businesses and the government, but, ultimately, it is the citizens' lifestyles, willingness to pay, and awareness will determine their success. When people are not sufficiently concerned about the environment, they are less likely to sacrifice higher pecuniary returns—via conventional, non-green financial instruments—for modest returns via GFS. The same argument can be applied to other green actions, such as using sustainable packaging, which also requires a financial sacrifice.

South Asia is taking momentous measures in the form of GFS. Some notable examples include India's National Clean Energy and Environment Fund, which invests in research aimed at clean energy technologies (Pandey et al., 2014). The Bangladesh Bank also launched a \$200 million Green Transformation Fund to subsidize industries purchasing environment-friendly machinery (CDKN Global, 2020). Pakistan implemented measures to support the financing of renewable energy, including the adoption of feed-in tariffs and the establishment of power purchase agreements (CPPA, 2022). Farmers in Pakistan have also moved toward more collective action to improve their capacity for climate change adaptation (Jabbar et al., 2023).

However, again, such solutions, like other developments towards green alternatives, are only viable if people are inclined to forgo some financial gains for the environment, and the climate

literature on Pakistan has not focused on whether the populace is willing and ready to adopt sustainable practices. This raises the question: what are the sociodemographic factors of Pakistan's populace that make it likely or unlikely to forgo economic gain for environmental sustainability? To answer this question, the paper considers question 111 in the WVS survey (Haerpfer et al., 2020), which is stated as a choice between the following options: (1) Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. (2) Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent. The premise of the paper, that people's preference for environmental sustainability over economic gain is an important indicator of their behavioral intentions to adopt the relatively costly green alternatives, is based on the Theory of Planned Behavior (TPB) put forward by Kamalanon et al. (2022). The paper is structured as follows: Section 1 puts forth the research objective; Section 2 offers a literature review; Section 3 presents the methodology and data analysis; Section 4 sets forth the study's results; Section 5 presents the results, discussion, and policy implications; and section 6 concludes.

Literature Review

I. Supply-Side and Demand-Side Studies

Mumtaz and Smith (2019) have performed a comparative supply-side analysis of Pakistan's green finance mechanism and concluded that, although China and India are better at implementing green banking practices, Pakistan is still only starting to formulate its strategy. Kumar et al. (2022) foresee a future where Pakistan can successfully reduce its carbon footprint through green alternatives, including green financing, but point to several hurdles: insufficient business advisory, policy uncertainties, financial short-termism, and inadequate government funding for green initiatives in businesses and banks. Banks support green loans because they might be a less risky investment than non-green loans, but there is a financing gap preventing adequate provision of such loans (Afridi et al., 2021). Ayaz et al. (2022) point to another obstacle: a lack of clear objectives and a legal and institutional framework. The consensus is that limited private sector involvement, lack of awareness, lack of policies with a clear structure, and inadequate financial support impede the success of green alternatives in Pakistan.

None of the research heretofore has analyzed the demand for green alternatives in Pakistan, especially from households. Consumers are a lynchpin in the country because, firstly, the demand for green initiatives is derived demand. It depends on the aggregate demand for green products, which is determined by households. Moreover, consumers might be willing to support struggling businesses that embody environmental practices. Even more importantly, they may be more receptive to crucial awareness initiatives.

Secondly, consumers decide whether green programs, such as loans for purchasing solar panels and energy-efficient vehicles, are successful. The same goes for green mortgage programs introduced by Bank Alfalah in Pakistan in 2022 (Bank Alfalah, 2022).

Finally, some green solutions are government-led carbon offset programs. These programs allow households to offset their carbon footprint by investing in projects that capture greenhouse gas emissions. Another example is government rebates such as tax credits given for installing energy-efficient upgrades to homes. However, the success of all such green alternatives depends on

the inclination of households to forgo temporary economic gain for environmental sustainability. Green alternatives can also include community-based projects where households participate in local sustainability initiatives, such as the 10 Billion Tree Tsunami (Sabir et al., 2022). Today, communities in Pakistan are becoming aware of the environmental and social impacts of their investments.

In short, households' role in determining the success of green solutions cannot be overlooked. In evaluating renewable energy in Pakistan, Malik et al. (2018) focused on consumer preferences. She concedes that clean energy will be less financially attractive because of its higher costs. Many developed countries, having embraced green services early on, have overcome the affordability issue and do not face this dilemma. Demand in China, for instance, is less limiting since it has made certain green technologies almost as affordable as non-green technologies, and the country plans to make renewables cheaper than coal in the next two years (Gordon, 2020). In Pakistan, green alternatives are more expensive than conventional sources (Malik et al., 2018), and since green alternatives are channels for investing in green finance, the demand side matters.

II. Why Do Socioeconomic Factors and Purchasing Intentions Matter?

Could certain socioeconomic factors and values make the people of Pakistan and South Asia relatively more inclined to make such sacrifices? If so, policymakers can adopt a targeted approach to propagating green solutions. While there is adequate research examining the supply side of green solutions, especially finance, a limited segment looks at the demand side. Studies have examined what sociodemographic factors are correlated with people's purchasing of green products in developed countries, but there is limited research in South Asia, and none in Pakistan, that looks at the probability of success for green finance from a consumer perspective and then provides tailored policy recommendations.

Why do green actions, such as green financing, matter if an individual prefers to forgo economic growth for environmental sustainability? We can think of this choice as a measure of people's green purchasing intention. Yue et al. (2020) show that environmental responsibility has a positive correlation with consumption intention, and environmental concern positively affects green consumption intention. Du et al. (2022) demonstrate the same, and Kamalanon et al. (2022) reinforce the association by showing that people's intentions to sacrifice personal benefit can have a significantly positive effect on green purchases, with the effect being higher in developing countries compared to developed ones. This makes the effect very relevant for Pakistan.

To establish a more theoretical basis, the Theory of Planned Behavior posits that a person's behavioral intentions are influenced by their attitudes towards the behavior, subjective norms, and perceived behavioral control. It should therefore be expected that pro-environmental behaviors, such as a preference for sustainability over economic growth, can be shaped by underlying beliefs stemming from religious, environmental, and personal values.

III. What Socioeconomic and Demographic Factors Matter?

Research has provided a consensus that socioeconomic context and culture must be considered in these discussions (Barr et al., 2011). Čábelková et al. (2023) show social and environmental value orientations are strongly interdependent, implying that how environmental problems are posed can be the deciding factor between the problem triggering an individual's social values or not. The authors show, for instance, that religiosity has a positive effect on

pro-environmental actions. Leonidou et al. (2022), studying the population of China and the United States, show that religiosity is consistently related to environmental sustainability beliefs while materialism is not.

Witek and Kuźniar (2020), however, surveying 650 Polish consumers, included several control variables in their research on how sociodemographic variables explain green purchasing behavior. She identified that gender, age, personal financial situation, and education all have a significant association with awareness and green purchasing behavior. On a global scale, women, people with decent personal financial situations, and people of relatively old age tend to be more inclined to purchase green products. However, people who are relatively more educated tend to prioritize their needs, or personal gain, over environmental values. This suggests that there might be an inverse relationship between the Pakistani people's decision to forgo economic growth for environmental sustainability and their level of education. Gasper (2006) shows the same relationship between being a woman, in particular a young woman, and preferring green aspects to higher financial returns in investment decisions. However, the relationship between income and sustainable behavior is uncorrelated. This could be because income and environmental concerns are non-linearly linked (Park et al., 2012). This broaches the following question: why is the relationship between other socioeconomic variables and environmental concern linear, and might such a linear relationship also exist between not just the income of the Pakistani people but also their other characteristics and their preference for environmental sustainability over economic gain?

Methodology

I. Data

The methodology is based on a quantitative analysis and the data for the regression analysis that follows was acquired from the World Values Survey (WVS) Wave 7. Two datasets are constructed, one for Pakistan and one for South Asia as a collective (Bangladesh, Maldives, Myanmar, and Pakistan). The 7th wave was conducted in 2018 in Pakistan and is based on a random sample of more than 1900 people. This sample size is adequate for generalization to the population. The variables of interest were taken and coded as follows. The dependent variable was the responses to Q111, which asked people if they prefer economic growth versus environmental sustainability. A dummy variable, Environment Preference, was formed from this binary variable which equals 1 if the person preferred environmental sustainability over economic growth.

Are the answers to Q111 in the WVS survey biased because the respondents were unaware of the trade-offs between economic growth and environmental sustainability? While this is not an unfounded concern, the WVS survey is interview-based and rules out the chances of the respondents being oblivious to what they are asked. According to the methodology, the interview is free of any bias and if the interviewee is unable to understand a question or the context behind it then he/she can ask the interviewer on the spot, thus ruling out the possibility that people's responses to Q111 are arbitrary. Moreover, the data has been cleaned, and the responses of all the individuals who did not pick one of these choices (economic growth or environmental sustainability) or did not know what these terms meant have been omitted from the analysis.

II. Specification & Variables

Where individuals obtain their information can also impact how concerned they are about the environment and how willingly they might sacrifice economic gain for environmental sustainability. A study from Bangladesh shows environmental journalism is a significant subfield in local newspapers and can sway people (Rahmatullah et al., 2021). Further, Gooch (1996) mentions that regional newspapers play a crucial role in disseminating environmental concerns, especially at the local level, in both poor and rich nations. Wakefield and Elliot (2003) also show that newspapers can be a key source of environmental risk information, but their impact is often mitigated by resident distrust and access to other information sources. Therefore, newspaper and internet use were included as explanatory variables in the model.

People's cultural values can also impact how likely they are to sacrifice economic gain for environmental sustainability. People's autocratic tendencies, synonymous with the culture's power distance (Terzi, 2011), defined by Hofstede (1985) as "the extent to which the members of a society accept that power in institutions and organizations is distributed unequally," can impact how environmentally concerned the people are (Schultz & Stone, 1994). A negative correlation between power distance and preservation of the environment is shown by Wiseman et al. (2012) who explain this by noting that people with acute autocratic tendencies might be relatively aggressive and self-serving, thus less sacrificial of their economic benefit. Countries exhibiting high power distance, indulgence, and individualism are less likely to achieve environmental sustainability, which indicates that how individualistic people are can also decide their environmental preferences (Zakari & Toplak, 2021).

Another cultural factor could be people's global identity, or how connected they feel to the world. Several authors identified a positive correlation between global identity and pro-environmental behavior, which can be explained by people's feelings of obligation, responsibility, and relevance to other humans (Pong & Tam, 2023).

Some feminist theories argue the rights of women and the environment are interlinked (Norgaard & York, 2005). Societies that empower women, especially their right to work, create an environment wherein thinking and acting pro-environmentally is embraced. These are societies that tend to prefer sustainability over personal benefit (Miao & Cagle, 2020).

Similarly, people's views of whether scientific progress is making society better can also impact how environmentally concerned they are. Lyons and Breakwell (1994) shows that attitudes towards science's progress are a good discriminating factor even after controlling for social class and knowledge, whereas age is weakly significant and sex and personal commitment to science are insignificant. Thus, from the category of cultural values, the variables power distance, global citizen, gender bias, and scientific optimism were formed.

Lastly, people's economic values inevitably affect their choice in an economic trade-off. An individual who advocates for free-market ideology is less likely to act pro-environmentally than an individual who argues for government ownership (Heath & Gifford, 2006). There is a lot of research that examines whether free markets and the 'invisible hand' can deal with climate change, but, in general, laissez-faire ideology dismisses the reality of climate change (Rapsikevicius et al., 2021).

Hofstede (1985) defines individualism as the extent to which individuals are supposed to take care of themselves as opposed to relying on groups or institutions. People in countries with high levels of individualism tend to cause more environmental damage since they are more likely to care about personal benefits than the social good (Komatsu et al., 2019). There is no explicit question in WVS on individualism but there is one that asks people if it is the government's responsibility to provide for people or people's responsibility. This reflects economic liberalism, of which individualism is a component (De Vita, 2013). To account for economic values, the variables "Free Market" and "Economic Liberalism" were formed.

To conclude, based on the literature and the theoretical framework above, the following control variables were taken and labeled for both models: Age, Female, Income, Education, Religiosity, and Rural (whether the respondent belongs to a rural area). All the variables and their definitions are given in Table I in the appendix.

III. Method of Analysis

The descriptive statistics of all the variables have been provided in Table II. Since the dependent variable is binary, logistic regression is used in both models to capture the effects of the independent variables on people's choices between economic gain and environmental sustainability. A significance level of 5% has been used to determine whether a variable is significant or not. Five specifications of the models have been run to test the results' robustness: full model, information sources specification, cultural factors specification, economic values specification, and sociodemographic specification. These are all displayed below, and their results are shown in Tables III and IV. The coefficients of logistic regression can be esoteric, so average marginal effects (AME) of full specifications are computed and shown in Table IV which compares the results between Pakistan and South Asia's models. Lastly, a multicollinearity check through the variation inflation factor has been performed.

Sociodemographic Specification:

$$Y_{i} = \beta_{1} Income_{i} + \beta_{2} Age_{i} + \beta_{3} Female_{i} + \beta_{4} Religion_{i} + \beta_{5} Education_{i} + \beta_{6} Rural_{i} + u_{i}$$

Economic Values Specification:

$$\begin{aligned} \boldsymbol{Y}_i &= \boldsymbol{\beta}_1 Incom\boldsymbol{e}_i + \boldsymbol{\beta}_2 \boldsymbol{Age}_i + \boldsymbol{\beta}_3 Femal\boldsymbol{e}_i + \boldsymbol{\beta}_4 Religion_i + \boldsymbol{\beta}_5 Education_i + \boldsymbol{\beta}_6 Rural_i + \\ \boldsymbol{\beta}_7 Free\ Market_i + \boldsymbol{\beta}_8 Economic\ Liberalism_i + \boldsymbol{u}_i \end{aligned}$$

Cultural Values Specification:

$$\begin{aligned} \boldsymbol{Y}_i &= \boldsymbol{\beta}_1 Income_i^\top + \boldsymbol{\beta}_2 Age_i^\top + \boldsymbol{\beta}_3 Female_i^\top + \boldsymbol{\beta}_4 Religion_i^\top + \boldsymbol{\beta}_5 Education_i^\top + \boldsymbol{\beta}_6 Rural_i^\top + \\ \boldsymbol{\beta}_7 Global\ Citizen_i^\top + \boldsymbol{\beta}_8 Power\ Distance_i^\top + \boldsymbol{\beta}_9 Gender\ Bias_i^\top + \boldsymbol{\beta}_{10} Scientific\ Optimism_i^\top + \\ \boldsymbol{u}_i^\top \end{aligned}$$

Information Sources Specification:

$$\begin{aligned} \boldsymbol{Y}_i &= \boldsymbol{\beta}_1 Incom\boldsymbol{e}_i + \boldsymbol{\beta}_2 \boldsymbol{Ag}\boldsymbol{e}_i + \boldsymbol{\beta}_3 \boldsymbol{Female}_i + \boldsymbol{\beta}_4 \boldsymbol{Religion}_i + \boldsymbol{\beta}_5 \boldsymbol{Education}_i + \boldsymbol{\beta}_6 \boldsymbol{Rural}_i + \\ \boldsymbol{\beta}_7 Internet \ \boldsymbol{Use}_i + \boldsymbol{\beta}_8 \boldsymbol{Newspaper} \ \boldsymbol{Use}_i + \boldsymbol{u}_i \end{aligned}$$

Full Specification:

$$\begin{split} \boldsymbol{Y}_i &= \boldsymbol{\beta}_1 Incom\boldsymbol{e}_i + \boldsymbol{\beta}_2 Ag\boldsymbol{e}_i + \boldsymbol{\beta}_3 Femal\boldsymbol{e}_i + \boldsymbol{\beta}_4 Religion_i + \boldsymbol{\beta}_5 Education_i + \boldsymbol{\beta}_6 Rural_i + \\ \boldsymbol{\beta}_7 Free\ Market_i + \boldsymbol{\beta}_8 Economic\ Liberalism_i + \boldsymbol{\beta}_9 Global\ Citizen_i + \\ \boldsymbol{\beta}_{10} Power\ Distanc\boldsymbol{e}_i + \boldsymbol{\beta}_{11} Gender\ Bias_i + \boldsymbol{\beta}_{12} Scientific\ Optimism_i + \\ \boldsymbol{\beta}_{13} Internet\ Us\boldsymbol{e}_i + \boldsymbol{\beta}_{14} Newspaper\ Us\boldsymbol{e}_i + \boldsymbol{u}_i \end{split}$$

Results

I. What Sociodemographic Factors Matter?

From specification 1, only gender (female) and education are statistically significant variables in Pakistan. In specification 5, with all independent variables, education becomes marginally significant (at the 90% level) and gender, while losing its significance, is still quite significant and negative. All other sociodemographic factors have no impact, in the case of Pakistan, on deciding whether an individual might be willing to sacrifice economic gain for the environment. This includes religiosity, which was shown to matter in the literature (Čábelková et al., 2023).

In the case of South Asia, gender, though still significant, is less significant in both the baseline and full specifications, whereas, unlike in Pakistan, income is now significant in the baseline model but not in the full model. Education, however, is highly positively significant in both specifications. This proves that education increases people's likelihood to sacrifice gain for sustainability.

II. Robustness Checks

Since we have three groups of constructs in our independent variables: cultural, economic, and information source, five different specifications have been constructed for both Pakistan and South Asia for the sake of testing robustness and analyzing the effects of each construct individually.

The first specification has only the sociodemographic variables of age, gender, education, income, religiosity, and settlement (rural or urban), whereas the second has these as control variables and the economic value of privatization as the main explanatory variable. Similarly, the third specification isolates the impact of the cultural factors, and the fourth isolates the impact of information sources factors. Lastly, the fifth specification comprises all three constructs to analyze their impact, controlling for sociodemographic and socioeconomic factors.

III. What Other Variables Matter?

Cultural Values

In Pakistan, being a global citizen seems to be highly significant and positive, whereas scientific optimism is moderately significant in both specifications and power distance is only slightly significant and positive. The results will be thoroughly discussed in the subsequent section, but some intuition is warranted. The positive impact of global citizenship and scientific optimism on environmental preference evinces a growing awareness of global environmental challenges and their long-term consequences. This awareness is likely heightened by Pakistan's vulnerability to climate

change, urbanization, and its agriculture-based economy, which directly affronts climate threats. Such factors encourage a shift towards prioritizing environmental concerns over short-term economic growth.

Conversely, in the broader South Asian region, the negatively significant effect of power distance and gender bias suggests that as traditional social structures are questioned, there is an increasing awareness of the link between environmental issues and social equity. The lack of impact from global citizenship and scientific optimism across South Asia may reflect a stronger persistence of traditional values, indicating that these global perspectives have not permeated deeply. The disparate results between Pakistan and South Asia can be ascribed to Pakistan's unique geopolitical characteristics and its rapid socio-economic changes that have fostered environmental awareness.

Information Sources

There are contradictory results between Pakistan and South Asia. In Pakistan, newspaper readership is a statistically significant and positive variable in both specifications, albeit less so in the full one. In the case of South Asia, it is not significant at all. This could be because of the diverse media landscape across the South Asian region, with other sources like television or social media playing a larger role in shaping environmental attitudes in other regions, whereas in Pakistan there is a historical legacy of newspapers as trusted sources of information, particularly among educated and politically engaged segments of society.

Economic Values

Lastly, for economic values, the results for South Asia and Pakistan are consistent. While the Free Market variable is negatively significant in Pakistan, it is barely significant in South Asia. Pakistanis might have a preference for more state-guided economic models, possibly influenced by the country's past autocratic systems and present-day hybrid regimes. Liberalism is highly significant and negative in South Asia but merely significant and negative in Pakistan. This could be due to a stronger overall resistance to liberal economic policies across South Asia, which might be engendered from concerns about their impact on traditional social structures and economic inequality.

IV. Marginal Effects

The marginal effects reveal subtle disparities in environmental preferences between Pakistan and South Asia, reflecting complex socio-cultural dynamics. In Pakistan, the gender gap is more pronounced, with women 7.4% less likely to favor the environment over economic growth compared to 2.5% in South Asia. This could be due to more entrenched gender roles in Pakistan. Education's meager impact in Pakistan (1.3% increase per education level versus 2.2% in South Asia) indicates environmental awareness might not be as integrated into the educational curriculum. The significant positive effect of global citizenship in Pakistan (4.3% more likely to favor the environment per unit increase) suggests exposure to global perspectives has a robust effect on environmental attitudes.

The negative impact of Free Market preferences on environmental concerns is more pronounced in Pakistan (1% decrease versus 0.4% in South Asia per unit increase), suggesting a

stronger perceived trade-off between economic liberalization and environmental protection. Interestingly, respect for authority correlates positively with environmental preference in Pakistan (2.9% increase per category), indicating trust in institutional approaches for environmental management. In South Asia, gender bias greatly reduces environmental preference (5.3% less likely), highlighting the interrelatedness between social equity and environmental attitudes. Lastly, the positive effect of newspaper readership on environmental preference in Pakistan (2.5% increase per frequency category) underscores the significance of traditional media in shaping public opinion on environmental issues, a factor insignificant in the broader South Asian region. These findings highlight the need for customized approaches to environmental education and policy-making that account for specific national and regional socio-cultural contexts.

Discussion

There are specific results and policy implications for both Pakistan and South Asia that can enable the entities to make green alternatives a success. To start with, there is a significant negative correlation between women and action-based support for green finance in Pakistan and South Asia. The literature, however, shows that women are more inclined to purchase green products than men. This cannot be due to the educational disparities between men and women since the model has controlled for education. Societal expectations and economic constraints in South Asia could make women less inclined to adopt green alternatives than men. Women in developing countries are expected to emphasize exigent concerns such as family welfare and finances, making them less focused on issues such as environmental degradation that might seem abstract (Duflo, 2012). Moreover, women face more economic challenges than men and this could make them favor economic gain over environmental sustainability since the former can help them overcome these economic strictures (Elborgh-Woytek et al., 2013).

After controlling for people's scientific optimism and incomes, education in Pakistan–unlike in South Asia–barely makes people more inclined to adopt green alternatives, indicating that there is a gap in Pakistan's educational curriculum that is preventing the youth from learning about environmental issues (Gul & Mahmood, 2021). In South Asia as a whole, however, where environmental education is more integrated into the educational curriculum on average, the effect of education aligns with the literature in making people exhibit pro-environmental attitudes (Meyer, 2015). The Pakistani single curriculum is inadequate. Unless students choose to take courses explicitly on the environment or energy, they are left without sufficient knowledge of the importance of environmental sustainability.

Those with higher incomes and those living in urban areas are just as likely to adopt green alternatives as those with lower incomes and living in rural areas, respectively. This concurs with the literature in that the effects of income are mixed (Park et al., 2012). Income, after holding education constant, does not seem to make one more willing to sacrifice economic gain for the environment even though the person might have more than enough income to lead a comfortable lifestyle. Similarly, age is not a discriminating factor. The old and the young are equally likely to adopt green alternatives in South Asia, which does not match the case in developed regions where Gen Z is found to be more willing to pay for green options (Gomes et al., 2023).

Coming to cultural values, in South Asia a high power distance makes people less inclined to adopt green alternatives, which is in contradiction to the situation in Pakistan but aligns with the

literature showing that higher power distance cultures are less inclined to make sacrifices for the environment (Wiseman et al., 2012). Pakistan, however, due to martial law and a cultural context where authority is esteemed and inequality is not abhorrent, has a populace that might be more receptive to adopting green alternatives if an august authoritative figure in the country advocates for GFS. The government and marketers should therefore align their green alternatives promotion strategies accordingly.

Moreover, in accordance with the literature (Pong & Tam, 2023), being a global citizen and being scientifically optimistic seems to matter in Pakistan only. Thus, initiatives promoting people's connectedness to the world and putting a positive light on technological progress can be effective in making people adopt green alternatives. For instance, while the current news coverage in Pakistan tends to be pessimistic, news channels can give more coverage to positive news about how technologies abroad are making not just other countries but also Pakistan better. The government can also emphasize the interconnected nature of environmental challenges and the role of individual citizens in addressing them.

Whether an individual obtains information from the internet seems to have no impact in Pakistan, whereas newspaper readers seem to be much more inclined to adopt green alternatives. Since the distributions of these variables in the samples of both South Asia and Pakistan are similar and balanced, the explanation that Pakistanis lack access to the internet can be ruled out. Newspapers having such an impact indicate local journalism in Pakistan may play a more influential role in shaping public opinion compared to broader South Asia. Localized reporting might resonate more with individuals, so fostering partnerships with local journalists and reputable newspapers (e.g. Dawn) in accurately reporting environmental issues can enhance the effectiveness of green alternatives campaigns.

Conclusion

Green alternatives can be considered a peripheral topic in Pakistan and South Asia where people are concerned about more immediate issues such as poverty, malnutrition, and illiteracy. While those issues are exigent, this is not a zero-sum game. The region can simultaneously work on reducing its carbon footprint and improving the different dimensions of economic conditions. Having to choose between one or the other is not necessary if the governments in the region, including Pakistan, take a tailored approach when formulating and implementing sustainable behavior policies. For Pakistan, such an approach involves taking note of the factors found significant in determining people's willingness to adopt green alternatives. For instance, the government should focus on incorporating environmental education into the national curriculum since the evidence shows that, despite obtaining degrees, Pakistanis are unwilling to forgo economic gain for environmental sustainability. Similarly, the government should work on empowering women and nudging societal expectations so that women can escape parochialism and encourage their families to focus on environmental issues.

The government should be cognizant of the power of local journalism in persuading people and should partner with reputable newspapers. It should also persuade the populace by showing that authoritative figures in the country are adopting green alternatives. The nation should emphasize people's connectedness to the world and how rapidly the world is progressing because of science and technology which can make people more receptive to green alternatives. Lastly, Pakistan should

also realize there is skepticism towards government-led initiatives, so most of the advocacy and advancement of green alternatives should be undertaken by the private sector. With tailored policies and initiatives like these, the governments in the South Asian region can make huge strides in making green alternatives a success in not only their own countries but in the entire region.

However, it is important to note that the paper was based on people's stated preferences, not their revealed preferences. As economists know, stated preferences are not always the best indicator of actual preferences. This is a limitation since the methodology relied on secondary data and it was not feasible to undertake a primary survey.

Lastly, further research is needed to explore the specific societal and economic factors that influence gender differences in environmental attitudes in South Asia following the results discussed in this paper. Comparative studies of environmental education curricula across South Asian countries could help identify effective approaches to fostering pro-environmental attitudes through education. Additionally, in-depth qualitative research could provide insights into why traditional media (newspapers) have had a deeper influence on environmental attitudes in Pakistan compared to digital media. Even better, longitudinal studies could help track how attitudes towards green alternatives evolve as countries in South Asia undergo economic and social development. This could allow an extrapolation of these findings to the future sustainability scene.

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Appendix

Table I: Definitions and Sources of All Variables

Variable	Scale and Type	Definition
Income	Ordinal variable	Question 288: Income 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in. 1 Lower step 2 second step 3 Third step 4 Fourth step 5 Fifth step 6 Sixth step 7 Seventh step 8 Eighth step 9 Nineth step 10 Tenth step
Age	Continuous	Question 262: Negative values cleaned from the data.
Female	Binary variable (coded)	Question 260: Sex Equals to 1 if the respondent is female.
Religion	Ordinal variable on a scale of 1-10	Question 164: How important is God in your life? 1 Not at all important 10 Very important
Education	Ordinal variable	Question 275: Highest educational level: Respondent [ISCED 2011] 0 Early childhood education (ISCED 0) / no education 1 Primary education (ISCED 1) 2 Lower secondary education (ISCED 2) 3 Upper secondary education (ISCED 3) 4 Post-secondary non-tertiary education (ISCED 4) 5 Short-cycle tertiary education (ISCED 5) 6 Bachelor or equivalent (ISCED 6) 7 Master or equivalent (ISCED 7) 8 Doctoral or equivalent (ISCED 8)
Rural	Binary variable (coded)	H_URBRURAL: Urban-Rural Settlement type Equals to 1 if the respondent is in a rural settlement.

Newspaper Use	Ordinal variable on a scale of 1-5	Question 201: Information source: Daily newspaper 1 Daily 2 Weekly 3 Monthly 4 Less than monthly 5 Never
Internet use	Ordinal variable on a scale of 1-5	Question 206: Information source: Internet 1 Daily 2 Weekly 3 Monthly 4 Less than monthly 5 Never
Free Market	Ordinal variable: coded to an inverted scale of 1-10.	Question 107: Private vs state ownership of business 1 Government ownership of business should be increased 10 Private ownership of business should be increased
Economic Liberalism	Ordinal variable: coded to an inverted scale of 1-10.	Question 108: Government's vs individual's responsibility. 1 The government should take more responsibility to ensure that everyone is provided for 10 People should take more responsibility to provide for themselves
Gender Bias	Binary variable	Question 33_3: men should have a greater right to a job than women. 1 Agree (coded to 1) 2 Disagree (coded to 0) 3 Neither agree nor disagree (omitted)
Power Distance	Binary variable	Question 45: Future Change: There should be greater respect for authority. 1 Good thing (coded to 2, most agreed) 2 Don't mind (coded to 1, neutral) 3 Bad thing (coded to 0)
Global Citizen	Ordinal variable: coded to an inverted scale of 1-4.	Question 249: Feel close to the world. 1 Not close at all 2 Not very close 3 Close

		4 Very close
Scientific Optimism	Ordinal variable: coded to an inverted scale of 1-10.	Question 158: Science and technology are making our lives healthier, easier, and more comfortable. 1 Completely disagree 10 Completely agree

Table II: Descriptive Statistics of all Variables (Pakistan)

Statistic	Mean	St. Dev.	Min	Max
Age	35.68	11.68	18	85
Economic Liberalism	5.07	3.60	1	10
Education	2.26	2.00	0	8
Environment Preference (Y)	0.45	0.50	0	1
Female	0.46	0.50	0	1
Free Market	5.04	3.52	1	10
Gender Bias	0.93	0.26	0	1
Global Citizen	3.27	0.99	1	4
Income	4.36	2.31	1	10
Internet Use	1.96	1.51	1	5
Newspaper Use	2.32	1.55	1	5
Power Distance	1.93	0.87	1	3
Religion	9.57	1.33	1	10
Rural	0.66	0.47	0	1
Scientific Optimism	7.75	2.81	1	10

N=1391

Table III: Regression Results of all Specifications (Pakistan)

Variables	(1)	(2)	(3)	(4)	(5)
Income	-0.01	-0.01	0.00	-0.02	0.00
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Age	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.417***	-0.414***	-0.460***	-0.275**	-0.311**
	(0.11)	(0.11)	(0.11)	(0.12)	(0.13)
Religion	-0.06	-0.06	-0.06	-0.05	-0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.088***	0.091***	0.084***	0.058*	0.056*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Rural	-0.08	-0.08	-0.05	-0.07	-0.05
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Free Market		-0.036**			0.181***
		(0.02)			(0.06)
Economic Liberalism		-0.037**			-0.037**
		(0.02)			(0.02)
Global Citizen			0.194***		-0.035**
			(0.06)		(0.02)
Power Distance			0.114*		0.122*
			(0.06)		(0.07)
Gender Bias			-0.13		-0.10
			(0.21)		(0.22)

Scientific Optimism			0.040**		0.04
			(0.02)		(0.04)
Internet Use				0.04	0.105**
				(0.04)	(0.04)
Newspaper Use				0.108***	-0.041**
				(0.04)	(0.02)
Constant	0.51	0.838*	0.08	0.12	0.01
	(0.47)	(0.49)	(0.55)	(0.49)	(0.59)
Observations	1,391	1,391	1,391	1,391	1,391
Log Likelihood	-943	-939	-934	-938	-92
Akaike Inf. Crit.	1,900	1,895	1,890	1,895	1,881

N=1391,

*** if p-value < 0.01, ** if p-value < 0.05, and * if p-value < 0.10

Decision Variable: Environment Preference (1 if prefer environment over economic growth).

Table IV: Regression Results of all Specifications (South Asia)

Variables	(1)	(2)	(3)	(4)	(5)
Income	-0.028**	-0.025*	-0.024*	-0.028**	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	-0.105*	-0.108*	-0.110*	-0.09	-0.103*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Religion	-0.02	-0.03	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Education	0.099***	0.102***	0.089***	0.096***	0.091***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Rural	-0.06	-0.06	-0.04	-0.06	-0.04
	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)
Free Market		-0.017*			0.04
		(0.01)			(0.03)
Economic Liberalism		-0.027***			-0.018*
		(0.01)			(0.01)
Global citizen			0.04		-0.029***
			(0.03)		(0.01)
Power Distance			-0.111***		-0.112***
			(0.04)		(0.04)
Gender bias			-0.192***		-0.209***
			(0.07)		(0.07)

Scientific optimism			0.00		-0.01
			(0.01)		(0.02)
Internet use				-0.01	0.03
				(0.02)	(0.02)
Newspaper Use				0.03	-0.01
				(0.02)	(0.01)
Constant	0.11	0.33	0.34	0.07	0.572*
	(0.28)	(0.29)	(0.31)	(0.28)	(0.32)
Observations	4,599	4,599	4,599	4,599	
Log Likelihood	-3,157	-3,151	-3,147	-3,156	4,599
Akaike Inf. Crit.	6,327	6,321	6,316	6,329	-3,140

N=1391,

*** if p-value < 0.01, ** if p-value < 0.05, and * if p-value < 0.10

Decision Variable: Environment Preference (1 if prefer environment over economic growth).

Table V: Average Marginal Effects of All Variables (Full Specification)

Statistic	Pakistan	South Asia
Age	-0.0001	0.0001
Economic Liberalism	-0.008	-0.007
Education	0.013	0.022
Female	-0.074	-0.025
Free market	-0.009	-0.004
Gender bias	-0.023	-0.051
Global citizen	0.043	0.010
Income	-0.001	-0.005
Internet use	0.010	-0.003
Newspaper Use	0.025	0.006
Power Distance	0.029	-0.027
Religion	-0.013	-0.005
Rural	-0.011	-0.010
Scientific Optimism N=1301	0.010	0.001

N=1391

Decision Variable: Environment Preference (1 if prefer environment over economic growth).