Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Assessing social capital, religious beliefs, and climate resilience among rural coastal households in the Vietnamese Mekong Delta

Duong Hoang Loc
University of Social Sciences and Humanities, Vietnam National University – Ho Chi Minh City
Duong The Duy
Ho Chi Minh City University of Foreign Languages – Information Technology
Chau Thi Da
chauthida@tdtu.edu.vn

Ton Duc Thang University

Research Article

Keywords: Social capital, religious belief, religious practice, coastal farming households, climate change, Mekong Delta

Posted Date: November 4th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11121634/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Climate change adaptation in vulnerable rural regions remains underexplored, particularly from the perspective of social and religious dynamics. In the coastal rural communities of the Mekong Deltaof Vietnam, despite increasing attention to climate adaptation, limited research has investigated how social capital and religious factors jointly shape adaptive behaviors. This study examines the relationships among social capital, religious beliefs, religious practices, and climate change adaptation using survey data from 335 coastal farming households. Structural equation modeling (SEM) with AMOS 20 reveals that all hypothesized relationships are statistically significant: social capital (structural, relational, and cognitive dimensions) positively influences religious beliefs, which in turn enhance religious practices and climate change adaptation. The study contributes theoretically by extending the application of social capital theory to the domain of faith and religion, while also offering practical implications: community development policies should consider the role of religious networks and social capital as mechanisms for psychological support and collective mobilization to enhance social cohesion and resilience in the face of ongoing socio-environmental challenges and climate change.

1. Introduction

Social capital, a key concept in social science research, is defined as the aggregate of networks, norms, and trust that facilitate coordination and cooperation for mutual benefit within a community. In the realm of religious belief and practice, social capital not only serves as a foundation for strengthening faith but also acts as a catalyst for social cohesion and sustainable community development. Prior studies have demonstrated that social capital is closely linked to individual health outcomes, community attachment, and resilience to socio-economic challenges [1, 2]. Notably, within religious organizations, social capital fosters social relationships and provides essential support systems that extend beyond the spiritual domain, contributing to the overall quality of life of community members [3].

The Mekong Delta of Vietnam provides a compelling setting to examine these dynamics. Its interconnected river systems and fertile landscapes support intensive agriculture and aquaculture, underpinning rural livelihoods and national food security [4–7]. These conditions have historically fostered strong communal interdependence and collective action, strengthening social capital across diverse ethnic groups, including the Khmer community [8]. In addition, dominant religious traditions in the Vietnamese Delta including Theravāda Buddhism, Vietnamese Mahāyāna Buddhism, local animist practices, and syncretic religions such as Hoa Hao and Cao Dai have a profound impact on community interactions and social integration [9]. These social and religious structures become particularly important under conditions of environmental stress. The Mekong Delta is increasingly affected by climate change, especially salinity intrusion and hydrological variability, which threaten agricultural production and rural livelihoods [10]. In this context, religiously grounded social networks can facilitate information exchange, mutual assistance, and collective responses, thereby supporting community adaptation and resilience [11].

Despite the expanding literature on social capital, religion, and community resilience, critical conceptual and empirical gaps persist. Current research frequently examines social capital in relation to developmental outcomes such as health, livelihoods, and social cohesion, yet often overlooks how religious beliefs and practices actively shape the formation, maintenance, and mobilization of these networks. Conversely, religious studies often emphasize spiritual and cultural dimensions without integrating these findings into broader social capital frameworks. Furthermore, while scholarship on climate change adaptation is growing, there is a very litle of research investigating how the intersection of social capital and religious life influences adaptive behaviors, particularly in climate-vulnerable rural regions like Vietnam’s Mekong Delta. Consequently, the specific mechanisms by which religiously grounded social networks facilitate equitable adaptation and community resilience remain insufficiently theorized and empirically under-explored.

The Vietnamese Mekong Delta is characterized by pronounced religious and ethnic diversity, encompassing Kinh and Khmer populations affiliated with Buddhism, Catholicism, Protestantism, Hoa Hao, Cao Dai, and other indigenous religious traditions, alongside Cham Muslim and Chinese Vietnamese communities practicing syncretic forms of Mahāyāna Buddhism and folk worship. Beyond their spiritual functions, these religious systems constitute dense social infrastructures through which trust, norms, and collective identities are produced and reproduced [12]. In this context, social capital is not merely embedded in interpersonal networks but is actively generated and reinforced through shared religious practices, rituals, and institutions. This interaction has important implications for climate change adaptation and community resilience. Religious institutions function as key nodes for mobilizing resources, disseminating information, and coordinating collective action, particularly in rural areas where formal state support remains limited. For instance, Khmer Buddhist temples provide not only spiritual guidance but also social services, including education and welfare support, thereby strengthening bonding and bridging social capital [3]. Similarly, Hoa Hao communities engage in extensive charitable and infrastructure-oriented activities such as constructing rural roads and bridges, offering free meals to disadvantaged patients, and facilitating transportation to urban healthcare centers which enhance local adaptive capacity and social protection mechanisms. These examples illustrate that religiously embedded social capital plays a critical yet underexplored role in shaping adaptive behaviors and resilience outcomes. By linking belief systems with collective action, religious networks contribute to both the distribution of resources and the formation of trust-based cooperation, underscoring their theoretical and empirical relevance within climate change adaptation discourse in the Mekong Delta.

In the context of increasing economic and environmental pressures particularly climate variability and agricultural price instability religious organizations in the Mekong Delta play a critical role in mobilizing social capital to support collective adaptation and community resilience [4, 5, 7]. For example, during the 2019 drought, Buddhist temples and Catholic parishes coordinated the provision of free drinking water to communities affected by freshwater scarcity, illustrating how religious networks enable rapid resource mobilization and collective action. Beyond these material functions, the interaction between social capital and religious belief also shapes individual well-being and adaptive capacity. Participation in religious communities is associated with stronger coping mechanisms, lower stress, and higher levels of perceived well-being, largely due to the emotional and material support embedded in these networks [13]. Moreover, shared norms and moral values cultivated within religious settings promote pro-social behavior, reinforce mutual assistance, and enhance community cohesion [3]. Together, these dynamics highlight the dual role of religiously embedded social capital in strengthening both collective resilience and individual adaptive capacity within climate-vulnerable contexts.

Beyond individual-level benefits, religiously embedded social capital plays a crucial role in enabling collective responses to social and environmental challenges. Religious organizations often serve as platforms for knowledge exchange and grassroots mobilization, particularly in natural resource management and environmental conservation [14]. For example, Hoa Hao farmers in provinces such as An Giang, Can Tho, Hau Giang, Dong Thap, Vinh Long, and Tien Giang provinces have promoted chemical-free rice cultivation to protect both human health and ecological systems, while Buddhist temples organize regular fish-release activities to support the regeneration of aquatic resources. These practices illustrate how religious networks translate shared beliefs into coordinated environmental action, thereby strengthening community-based adaptation. However, access to and benefits from religious social capital are unevenly distributed. Socioeconomic inequalities, ethnic differences, and disparities in resource access can constrain participation, particularly among marginalized or remote populations. This unevenness underscores the need for more inclusive approaches to ensure that the adaptive potential of religious social capital contributes to equitable resilience outcomes [15].

Given the Mekong Delta's rich cultural and ecological diversity, this study investigates how social capital influences religious beliefs, practices, and adaptation of climate change. It places particular emphasis on the role of religious

organizations in fostering community cohesion, enhancing social welfare, and strengthening resilience amid ongoing socio-environmental challenges and climate variability. This study aims to: Examine how different dimensions of social capital influence religious belief among coastal households. Investigate the relationship between religious belief and religious practices. Analyze how social capital and religious engagement contribute to community resilience in the context of climate change. Finally, to contribute to theoretical advancement in the social sciences and to inform practical strategies for sustainable community development through an improved understanding of the interplay between social capital and religious life. The findings of this study provide a stronger basis for designing inclusive, equitable, and context-specific development policies in the Mekong Delta and in regions with similar ecological and cultural conditions. By clarifying the interconnections among religion, social capital, and climate adaptation, the study strengthens the justification for integrating sociocultural dimensions into climate policy and contributes to building more just, socially cohesive, and climate-resilient communities. The study makes a key theoretical contribution by introducing and systematically conceptualizing “religious social capital under climate stress.” This concept captures how religion-based social networks through trust, norms of reciprocity, shared identity, and moral values function as a distinct form of capital that supports psychological well-being, reinforces social cohesion, and mobilizes both collective and material resources in response to climate change. In doing so, the study extends conventional social capital theory by explicitly incorporating religion and belief systems, which remain underexplored in climate adaptation research in the Mekong Delta.

In addition, the study proposes a clear mediating mechanism linking the structural, relational, and cognitive dimensions of social capital to adaptive outcomes. Specifically, social capital shapes religious beliefs, which in turn act as a critical pathway through which social capital is translated into climate-responsive religious practices. This framework advances existing theory by demonstrating that religion is not merely an outcome of social capital, but a central mechanism through which its effects on adaptive behavior are transmitted and potentially amplified. By highlighting this role, the study addresses a significant theoretical gap concerning the contribution of religion to community resilience under climate change.

2. Theoretical approach and perspective review

2.1. Social capital practices

The concept of social capital was first introduced by Hanifan in 1916 and has since been interpreted and expanded upon by scholars across various disciplines, including education and development economics [15–17]. Social capital encompasses both the actual and potential resources embedded within the network of relationships possessed by an individual or a social entity [18]. Nahapiet J and Ghoshal S [18] conceptualize social capital through a tripartite framework comprising structural, relational, and cognitive dimensions, each contributing distinct functions to the development and application of social capital. The structural dimension pertains to the pattern of connections among individuals within a network, emphasizing the frequency of interaction and information exchange. This dimension refers to how an individual or group’s social ties are arranged, including both direct and indirect relationships that facilitate the flow of resources and information. It highlights the overarching architecture that governs social interactions, particularly the presence, intensity, and patterns of relational links. Research in this domain has examined how these structural features enable effective communication and coordination, with emphasis placed on the frequency and quality of information exchange as key determinants [19–22].

In contrast, the relational dimension of social capital focuses on the personal ties formed through repeated social interactions. It captures the emotional and normative elements of social capital, including trust, reciprocity, and mutual recognition, which are essential for sustaining strong interpersonal relationships. This dimension highlights the role of shared histories and ongoing interactions in building dependable social bonds that enhance social cohesion and

cooperation within communities and organizations. Accordingly, the relational dimension has been widely examined in networked and community contexts, where trust and reciprocity are fundamental to maintaining long-term social relations [22, 23]. The cognitive dimension refers to the shared meanings, values, and goals that shape collective action within a social network. It encompasses common norms, behavioral expectations, and interpretive frameworks that guide acceptable conduct and align individual behavior with collective objectives. Elements such as shared language, collective aspirations, and a unified sense of purpose foster belonging and facilitate coordination among members. By providing a shared context of meaning, the cognitive dimension enables coherent social interaction and collective decision-making [20–22]. Together, the structural, relational, and cognitive dimensions form a comprehensive model for understanding social capital, highlighting the diverse mechanisms through which network interactions facilitate resource access and collective action. This integrated perspective underscores the importance of analyzing both interpersonal linkages and the embedded shared knowledge that underpins them, each being essential for the effective functioning of social capital across a variety of contexts.

According to Nahapiet J and Ghoshal S [18], social capital comprises three dimensions: structural, relational, and cognitive. (1) The structural dimension of social capital refers to the network of connections among members that is, with whom and how frequently they share information. From this perspective, the structural aspect of social capital encompasses patterns of social interaction [24, 25]. (2) The relational dimension describes the types of personal relationships individuals develop with one another through a history of interactions. Trust, reciprocity, and identification are considered key attributes of this dimension [23, 26, 27]. (3) The cognitive dimension of social capital is reflected in elements such as a shared code or common paradigm that facilitates a collective understanding of goals and appropriate behaviors within a social system. Several studies have regarded shared goals as a major construct of cognitive capital [28, 29].

2.2. Theoretical foundations of religious practices

Religious practice is commonly understood as the way religious beliefs are expressed and reproduced through everyday actions, rituals, and social interactions. In sociology, religion has long been viewed as a social phenomenon that strengthens collective cohesion through shared rituals and moral norms (Longhofer W and Winchester D [30]. Weber M [31] further emphasized religion as meaningful social action, arguing that religious values and practices shape individual behavior and social relationships. More recent approaches highlight the social and embodied nature of religious practice. Bourdieu P [15], Bourdieu P [32], Ferrary M [33] conceptualized religious practice as shaped by habitus and social capital, where participation in religious activities reinforces networks, norms, and symbolic resources within communities. Studies on embodiment and material religion also suggest that practices such as prayer, pilgrimage, and ritual participation not only reflect belief but actively sustain and reproduce it in daily life [34, 35]. Drawing from these perspectives, this study conceptualizes religious practice as a socially embedded activity through which religious belief is maintained and social relationships are strengthened. This framework is particularly relevant for examining how religious belief and practice interact with dimensions of social capital, including trust, social networks, and community participation.

2.3. Religious and beliefs practices

Belief and religion are closely related concepts but differ in scope and organization. In the Vietnamese context, belief (“Tín ngưỡng”) generally refers to spiritual faith expressed through traditional rituals and community customs, whereas religion (“Tôn giáo”) refers to a more institutionalized system of doctrines, rituals, and organized communities stated by *Law on Belief and Religion, 2016*. Both forms coexist within Vietnamese society and contribute to cultural identity and social cohesion.

Sociological perspectives emphasize that religious belief provides meaning, moral orientation, and a sense of belonging, while shared rituals and values strengthen social relationships and collective identity [36]. Religious belief also influences social attitudes and participation in community life, thereby shaping patterns of trust, interaction, and civic engagement [37, 38]. In this study, religious belief is conceptualized as an individual's level of faith and commitment to spiritual or religious values, while religious practice refers to participation in rituals and religious activities. These dimensions are closely associated with social capital because religious communities often foster social networks, reciprocity, trust, and collective participation. Accordingly, the relationship between religious belief, religious practice, and social capital provides an appropriate framework for the SEM model used in this research.

Belief and religion are two closely related yet distinct socio-cultural phenomena. Semantically, the Vietnamese term *"Tín ngưỡng"* originates from Sino-Vietnamese, meaning "faith and reverence," reflecting a spiritual belief in supernatural or sacred forces (Dao Duy Anh, 1950, cited in *Discussion on the Concept of Religion and Belief*). In contrast, the concept of *"Tôn giáo"* (religion) refers to a broader, organized system of faith structured through doctrines, laws, rituals, and a community of followers (Disseminating Legal Education, 2016). This distinction illustrates two cultural approaches: while *belief* is linked to folk practices and local identity, *religion* tends to be more institutionalized and universal in nature. According to the *Law on Belief and Religion* (2016), *belief* is defined as "a person's faith expressed through rituals linked to customs and traditional practices aimed at achieving spiritual peace for individuals and communities," whereas *religion* is described as "a person's faith expressed through a system of concepts and practices including objects of worship, doctrines, laws, rituals, and organizations." This distinction institutionalizes a defining feature of Vietnamese culture, where indigenous belief forms such as the worship of Mother Goddesses, village tutelary deities, and ancestors serve as the spiritual foundation of the nation, coexisting alongside major organized religions such as Buddhism, Catholicism, and Protestantism (*Exploring the Concept of Belief from the Perspective of Vietnamese Culture*).

From anthropological and sociological perspectives, numerous scholars have sought to explain the origins and functions of religion. Tylor EB [39] posited that religion arose from a "belief in spiritual beings," emerging from human attempts to explain dreams and death through the concept of the soul (*Animism, Affect, Spiritual Beings*). Frazer JG [40] expanded on this idea, viewing religion as an intermediate stage in the evolution of human thought from magic to religion, and then to science. In contrast, Bourdieu P [32], Herzfeld M [41] approached religion from a functionalist standpoint, interpreting it as a sacred mechanism that sustains social cohesion and reinforces moral order (*Religion from a Sociological Perspective*). Marx K [42] viewed religion as a product of socio-economic conditions "the opium of the people" that both consoles and numbs the oppressed classes (*Karl Marx's Opium Theory*). Conversely, Freud S [43] explained religion as a psychological illusion, originating from unconscious human desires for protection and comfort (*Religion in Psychoanalytic Thought*).

From these theoretical perspectives, it is evident that both belief and religion are products of human spiritual life, reflecting the need for understanding, faith, and the search for meaning in the world. While religion manifests at a systematic level with doctrines and institutions belief represents a more flexible form of faith, deeply embedded in community life and folk culture. In the Vietnamese context, the two concepts coexist in an interwoven and complementary relationship, together shaping the spiritual and cultural identity of the nation. Religious belief constitutes a complex construct encompassing a system of convictions related to the nature of the divine, the purpose of life, and the moral principles that guide behavior. These beliefs often serve as a framework through which individuals interpret their experiences and understand their place in the world. According to Atran and Ginges, religion not only provides a sense of meaning and belonging but also functions as a moral compass that shapes both individual and collective behavior [44]. Furthermore, sociological perspectives on religious belief emphasize its role in fostering community cohesion and social identity, as shared values and rituals often bind individuals together [36]. The interaction between religious belief and broader social factors such as economic inequality and cultural context can

significantly influence the strength and expression of religious convictions. Empirical evidence has shown that variations in religiosity across societies pose challenges to traditional secularization theories [45]. In addition, religious beliefs have been found to influence social behavior, including political participation and attitudes toward public issues, underscoring their profound impact on both personal life and broader societal dynamics [37, 38]. Overall, theoretical approaches to religious belief highlight its multifaceted nature, reflecting a synthesis of personal faith, cultural transmission, and social interaction. This complexity necessitates a nuanced understanding of how religious belief operates across different sociocultural and institutional contexts.

1. Theoretical framework on the relationship between social capital, religion belief, and religious practice under climate change

Social capital, religion–belief, and climate change are interrelated, multidimensional factors that interact in shaping community resilience, adaptation, and development. According to Bourdieu P [15], Coleman JS [16], Putnam RD [46], social capital refers to the aggregate of material and non-material resources formed through social networks, sustained by trust, norms, and cooperation [18]. The three fundamental components, networks, trust, and norms constitute the foundation for collective action, reducing social transaction costs and enhancing coordination within communities. When these networks are disrupted, trust declines, or norms deteriorate, a community's capacity to withstand and adapt to environmental crises is significantly weakened [22, 47]. Religion and belief play a central role in generating and sustaining social capital. At the sociological level, religion functions not only as a system of personal belief but also as a social institution that creates dense networks of interaction, establishes behavioral norms, and reinforces mutual trust [23, 46]. Through rituals, collective activities, and charitable work, religious communities serve as "social schools" where individuals learn cooperation, management, and leadership skills [48]. Consequently, religious institutions cultivate a strong form of bonding social capital, reinforcing internal solidarity, nurturing trust, and fostering a sense of social security. Sociological surveys in Vietnam reveal that over 80% of religious adherents expand their social relationships through religious participation and consider "building mutual trust" as its greatest outcome (Tran Huu Quang, 2010, cited in Section 2). This underscores religion's role as a sustainable social resource built upon recurrent interactions, attachment, and shared values.

In the face of intensifying climate change, the components of social capital are increasingly strained by ecological and socio-economic shocks. In the Mekong Delta, phenomena such as saltwater intrusion, sea-level rise, crop failure, and labor migration have eroded traditional networks and weakened social cohesion [49, 50]. As younger members migrate, local systems of reciprocity, trust, and mutual aid are disrupted, diminishing the community's collective strength. Nevertheless, new forms of social capital have emerged through faith-based groups, women's religious associations, and "green cooperatives," which rebuild adaptive support networks [51, 52]. These reflect bridging and linking social capital, where religious communities establish connections with government agencies, NGOs, and private sectors to enhance climate resilience.

Belief and religious practice also shape human interpretation and behavioral responses to climate change. Many Southern Vietnamese religious communities perceive extreme natural events, storms, droughts, or saltwater intrusion as manifestations of spiritual imbalance or karmic retribution [53, 54]. While such interpretations provide meaning and psychological comfort, they may also foster fatalistic attitudes that hinder proactive adaptation [44]. Conversely, faith traditions promoting simplicity, environmental respect, and communal sharing such as Hoa Hao Buddhism offer moral frameworks that encourage sustainable behavior aligned with green development goals [53–55]. Hence, belief systems not only guide individual conduct but also shape collective value orientations essential for social adaptation to climate change.

This interrelation is further evident in the growing role of Faith-Based Organizations (FBOs). With their cohesive networks and high levels of trust, FBOs can swiftly mobilize local resources, providing material, emotional, and spiritual aid during disasters [56]. In Vietnam, many pagodas, churches, and temples have functioned as relief centers supplying food, clean water, temporary shelter, and medical care during floods and storms [57]. These examples illustrate how religious social capital acts as a community's "first shield" against climate shocks. Additionally, the emergence of eco-theology movements is shifting perceptions from "fatalistic acceptance" to "proactive stewardship," reframing humanity as caretakers responsible for the planet [58]. However, religious social capital also has its "dark side." When internal bonding becomes overly strong and insular, communities risk becoming conservative, resistant to scientific knowledge, or opposed to new adaptation policies [17]. Some groups interpret climate change as "divine will" or an "apocalyptic sign," which can impede innovation and interfaith cooperation. This reflects the downside of social capital, where internal cohesion coincides with external exclusion and delays in transformative action [8, 59–61].

In summary, religion and belief serve as crucial mediating channels linking social capital to adaptive capacity under climate change. Religion functions simultaneously as a generator of social capital and a cultural filter shaping communal responses to environmental crises. When religious institutions leverage the positive dimensions of social capital trust, solidarity, and moral action community resilience is strengthened. Conversely, when exclusivity, fatalism, and anti-scientific attitudes prevail, social capital can become a barrier to sustainable development. Understanding this dialectical relationship among social capital, religion belief, and climate change thus provides a theoretical foundation for designing culturally grounded, community-based, and sustainable adaptation policies for the future. A conceptual diagram illustrating the relationships among the dimensions of social capital, religious belief, religious practice, and the climate change context has been provided (Fig. 1).

2.5. Climate change, social capital, and religious practices in the Mekong Delta

The Mekong Delta, often referred to as Vietnam's "rice bowl," is among Southeast Asia's most ecologically sensitive and climate-vulnerable regions. Intensifying stressors including sea-level rise, saline intrusion, altered hydrological regimes, and increasingly unpredictable weather pose serious threats to agricultural production, food security, and rural livelihoods [60, 62–64]. Beyond its biophysical and economic impacts, climate change in the Mekong Delta is increasingly recognized as a socially embedded process that reshapes local institutions, household relations, and everyday practices [65, 66]. Two critical dimensions through which these transformations unfold are social capital and religious practices.

Social capital is commonly understood as networks, trust, and shared norms that facilitate collective action [46, 47], plays a central role in household and community responses to environmental risks. In the Mekong Delta, social capital is traditionally rooted in kinship ties, neighborhood solidarity, informal labor exchange, and local associations, enabling access to information, labor, and mutual support during climate-related shocks [54]. However, intensifying environmental degradation, combined with youth out-migration and livelihood diversification, has strained these traditional forms of social cohesion [67]. In response, new forms of adaptive social capital such as climate-oriented cooperatives, self-help groups, and women's savings associations have emerged to support risk sharing and resource mobilization [51, 52, 57]. Nonetheless, access to these networks remains uneven, raising concerns about equity and inclusion in climate adaptation pathways.

Religious practices and spiritual worldviews constitute another important, yet often underexplored, dimension of climate adaptation in the Mekong Delta. The region's diverse religious landscape including Mahayana Buddhism, Hoa Hao, Cao Dai, and ancestor worship deeply shapes cultural values, moral frameworks, and collective life [55, 68].

Religious institutions frequently function as nodes of social support by providing material assistance, emotional care, and a sense of belonging during periods of climatic stress [55, 56].

At the same time, religious cosmologies influence how environmental change is interpreted: while some beliefs frame climate impacts as spiritually predetermined, potentially discouraging proactive adaptation, others promote ecological ethics, stewardship, and collective responsibility. For instance, Hoa Hao Buddhism emphasizes frugality and harmony with nature, principles that resonate strongly with sustainability and resilience [53]. Conversely, other religious frameworks actively promote ecological stewardship, ethical living, and harmonious coexistence with nature. Hoa Hao Buddhism, for example, emphasizes simplicity, frugality, and respect for natural resources principles that align closely with sustainability and collective resilience [53]. Increasingly, religious actors are also engaging in environmental initiatives, disaster response, and climate awareness, linking spiritual practice with practical adaptation.

Taken together, social capital and religious practice constitute interrelated, culturally embedded resources that shape how households in the coastal rural communities of the Mekong Deltaperceive and respond to climate change. Yet these resources are themselves subject to transformation and erosion under conditions of environmental stress and socio-economic change. Further research is therefore needed to examine how social and religious institutions evolve over time and how they can be supported in fostering more inclusive, culturally grounded, and resilient responses to climate change.

3. Materials and methodology

3.1. Research hypothesis

Social interaction and religious belief: This study hypothesizes that social interaction, as a component of social capital, significantly influences religious belief. This relationship can be understood through the lens of social capital theory, which emphasizes the importance of social networks and community engagement in shaping individual attitudes and behaviors. Dauner KN and Wilmot NA [69] suggest that social capital can enhance religious adherence by providing a supportive environment that promotes communal relationships and shared values, thereby influencing individual belief and practice. Similarly, Clark EM, Ma L, Williams BR, Ghosh D, Park CL, Schulz E, Woodard N and Knott CL [70] argue that religious and spiritual capital contributes to both emotional and physical well-being, highlighting that the quality of social interaction within religious communities strengthens personal well-being and reinforces belief systems. Maselko J, Hughes C and Cheney R [71] further underscore the role of religious social capital in providing coping frameworks for stressors, showing that individuals embedded in supportive religious networks are more likely to internalize and practice their religious beliefs. Collectively, these studies suggest that the depth and quality of social interaction within the framework of social capital play a critical role in shaping and sustaining religious belief, supporting the hypothesis that social capital dynamics significantly influence individual religiosity. The hypothesis of social interaction and religious belief is stated as follows: *H1: Social interaction has a positive effect on religious belief*.

Trust and religious belief: This hypothesis posits that trust, as a core element of social capital, significantly impacts religious belief. Trust within social networks fosters a sense of belonging and community cohesion, which can enhance individual commitment to religious beliefs. Mencken FC, Bader C and Embry E [72] argue that religious affiliation is strongly linked to levels of interpersonal trust, indicating that individuals with strong religious identities tend to exhibit higher levels of trust toward both religious institutions and fellow believers. Loveland M, Capella A and Maisonet I [73] expand on this by discussing the complex relationship between religious belief and social trust, noting that while some forms of belief and practice correlate with increased social trust, others may reduce it. Beauchamp AL and Rios K [74] also highlight that religiously affiliated individuals are more likely to perceive religious leaders as trustworthy, thereby reinforcing belief systems and encouraging compliance with religious teachings. Furthermore, Benjamins MR [75] finds

that religious individuals often extend their trust to healthcare providers, implying broader social trust that may also reinforce religious belief. Together, these findings support the hypothesis that trust, as a dimension of social capital, plays a critical role in shaping and maintaining religious belief and contributes to the broader understanding of the social and spiritual interplay. The hypothesis of trust and religious belief is stated as follows: *H2: Trust and religious beliefs have a positive effect on religious belief*.

Norms of reciprocity and religious belief: The hypothesis suggests that norms of reciprocity, a fundamental component of social capital, significantly affect religious belief. Reciprocity, defined as the mutual exchange of support and resources within a social network, fosters a sense of obligation and social connectedness, which may increase religious engagement. Conley C, Gonzalez-Guarda R, Randolph S, Hardison-Moody A, Fisher EB and Lipkus I [76] argue that religious social capital is characterized by relationships that facilitate mutual support among community members, indicating that such reciprocal ties can strengthen individual commitment to religious beliefs and practices. Similarly, Hussen SA, Tsegaye M, Argaw MG, Andes K, Gilliard D and del Rio C [77] emphasize that reciprocal relationships within social networks enhance resilience and coping mechanisms, potentially reinforcing faith and adherence to religious teachings. While Mellor JM and Freeborn BA [78] discuss the link between religious participation and health behaviors, their focus does not directly address the role of reciprocal exchanges in religious contexts, limiting the applicability of their findings to the present hypothesis. Nonetheless, the evidence points to the conclusion that norms of reciprocity not only facilitate social cohesion in religious communities but also play a vital role in shaping and maintaining personal belief systems. The hypothesis is stated as follows: *H3: Norms of reciprocity and religious belief have a positive effect on religious belief*.

Identity and religious belief: This hypothesis asserts that identity, as a crucial component of social capital, significantly influences religious belief. Identity encompasses shared characteristics and values that define individuals within a social group and plays a pivotal role in shaping religious relationships and practices. Hopkins N [79] argues that religious identity is not merely an individual attribute but a socially constructed framework that informs interpersonal interactions and community attachment. Conley C, Gonzalez-Guarda R, Randolph S, Hardison-Moody A, Fisher EB and Lipkus I [76] further support this view by defining religious social capital as the social resources available through relationships within religious groups, asserting that strong religious identity enhances social cohesion and fortifies belief systems. Igor Y, Vera B, Vladimir R, Tatyana G and Andrey V [80] highlight the role of social technologies and pedagogy in cultivating religious identity, suggesting that structured social interactions can facilitate the internalization of belief systems. Similarly, Foster MK and Meinhard AG [81] demonstrate that strong identity within religious settings correlates with increased adherence to religious norms and active community participation. Collectively, these findings affirm the hypothesis that identity, as a facet of social capital, plays a central role in shaping and maintaining religious belief, influencing both individual and collective religious engagement. The hypothesis is stated as follows: *H4: Identity has a positive effect on religious belief*.

Shared goals and religious belief: This hypothesis proposes that shared goals, as an essential aspect of social capital, significantly impact religious belief. Common goals within religious communities foster solidarity and collective purpose among members, which can strengthen personal commitment to religious faith. Conley C, Gonzalez-Guarda R, Randolph S, Hardison-Moody A, Fisher EB and Lipkus I [76] argue that religious social capital is characterized by shared values and objectives that facilitate cooperation and mutual support among believers, thereby reinforcing belief systems. Shapiro E [2] adds that shared cultural values and aspirations among worshippers can create a protective environment that not only supports personal belief but also promotes collective religious activity. Consequently, the alignment between individual aspirations and the overarching goals of a religious community may deepen personal religiosity, suggesting that the presence of shared goals within the structure of social capital plays a crucial role in shaping and sustaining religious belief. The hypothesis is stated as follows: *H5: Shared goals have a positive effect on religious belief*.

The relationship between religious and belief practice

Religious belief and religious practice are mutually interdependent, forming a complex and reciprocal relationship that significantly shapes the nature and expression of faith within diverse communities. It is hypothesized that religious belief serves as a foundational framework that motivates and structures both individual and collective practices. For instance, within Christianity, belief in the presence of the divine and the importance of communal worship drives church attendance, thereby reinforcing spiritual identity and social cohesion Kusmanto H, Regif S, Ohorella N, Noorikhsan F and Nasution L [82]. Similarly, in digital religious communities such as Anglican online congregations, deeply held beliefs about God and the meaning of life are hypothesized to influence patterns of ritual participation, illustrating how ideology informs practice [83].

A further hypothesis suggests that the belief-practice relationship extends to social behavior, wherein stronger religious beliefs are linked to higher levels of cooperation and community involvement. Evidence indicates that participation in religious practices is primarily driven by belief, rather than by mere institutional affiliation [84]. Moreover, conservative theological views may strengthen social cohesion, as individuals who hold judgmental perceptions of God are more likely to engage in communal worship, further reinforcing the link between belief and practice [85]. The dynamic nature of this interaction is hypothesized to manifest in the adaptability of religious practices in response to external challenges. For example, during the COVID-19 pandemic, changes in traditional rituals and patterns of participation underscored how core beliefs adapt practices to contemporary contexts [86]. Additionally, it has been argued that communal worship contributes significantly to human flourishing, including enhanced well-being and life satisfaction, thereby highlighting the centrality of belief in shaping collective religious activities [87]. In conclussion, the proposed hypothesis posits that religious belief not only guides religious practices but is also reinforced through communal participation and shared experiences. This reciprocal and multidimensional relationship is essential to understanding the lived experiences of both individual adherents and religious communities. The hypothesis is stated as follows: *H6: Religious belief has a positive effect on religious practice*.

3.2. Research model

The authors have developed the above hypotheses into a theoretical research model. Figure 2 illustrates the proposed model, in which we examine the structural dimension (social interaction ties), relational dimension (trust, reciprocity, and identification), and cognitive dimension (shared goals) of social capital. These dimensions are hypothesized to influence religious belief, which in turn is posited to affect religious practice. The model proposes that religious belief functions as a mediating variable linking the dimensions of social capital to religious practice, and this mediating effect is empirically tested using bootstrapping procedures.

3.3. The context of empirical study

The Vietnamese Mekong Delta is characterized by complex natural conditions, a dynamic socio-economic structure, and significant vulnerability to climate change, shaping the lives of approximately 20 million residents. Geographically, the Delta spans approximately 39,000 km² and serves as the country's principal agricultural hub, primarily through rice cultivation and aquaculture [88]. Its flat terrain and fertile alluvial soil make it particularly well-suited for agriculture, supporting intensive two- and three-crop farming systems [88]. However, the region's unique ecosystem is increasingly threatened by climate-related phenomena such as intensified flooding, drought, and saltwater intrusion caused by sea-level rise [89, 90]. These environmental stressors are further exacerbated by anthropogenic activities, particularly the construction of upstream hydropower dams that disrupt sediment flows and contribute to delta erosion [12, 91].

From a socio-economic perspective, the Mekong Delta remains one of the most impoverished regions in Vietnam. Many communities rely on subsistence agriculture and face considerable challenges related to water quality, access,

and infrastructure [92]. The convergence of these factors results in precarious living conditions, compelling local populations to adopt adaptive agricultural practices and engage in community-based resilience initiatives [93]. As such, the intersection of environmental conditions, socio-economic realities, and climate change poses significant risks and calls for urgent adaptive strategies in the Mekong Delta.

3.4. Study area and sampling

A convenience sampling method was employed in this study, with structured survey questionnaires distributed to coastal households in selected provinces of the Mekong Delta. Specifically, the provinces of Ca Mau, Bac Lieu, Ben Tre, and Tra Vinh provinces were selected as the study sites. This selection was based on a combination of geographic-socioeconomic characteristics and the region's distinctive cultural and religious features. These provinces are particularly exposed to the impacts of climate change, including salinization and livelihood disruptions, which underscores the importance of understanding the role of social capital and religious values in maintaining community cohesion, mutual support, and adaptive capacity.

These provinces are also characterized by a high degree of religious and ethnic diversity, with the presence of Theravāda Khmer Buddhism, Roman Catholicism, Hoa Hao Buddhism, and Protestantism. The coexistence of multiple forms of religious practice in a socially specific context such as the coastal zone provides a valuable setting for in-depth exploration of the relationships among religious belief, religious practice, and social capital at the household level. Moreover, these areas have been pilot sites for various rural development, adaptive livelihood, and new rural construction programs, where informal social organizations, trust, and community ties play pivotal roles. The selection of these locations ensures both representativeness of the Mekong Delta's coastal regions and the richness of qualitative and quantitative data necessary for comparative and generalizable analysis. Participation was entirely voluntary. Before data collection, the study objectives, procedures, confidentiality safeguards, and the participants' right to decline participation or withdraw were explained to all respondents, and verbal informed consent was obtained from each participant.

3.5. Data collection and sample size

Data were collected through in-person distribution of structured paper-based questionnaires. The minimum sample size was determined based on structural equation modeling (SEM) requirements, which suggest a ratio of at least five observations per observed variable [94, 95]. Given that the research model includes seven latent variables and 26 observed indicators, the minimum required sample size was set at 200. To ensure adequacy, the research team distributed 433 survey forms during two rounds of fieldwork conducted in October 2024 and February 2025. A total of 347 completed questionnaires were returned, of which 12 were deemed invalid, resulting in a final sample size of 335 valid responses. A total of 335 households (respondents) were surveyed, with an uneven distribution across provinces. Ca Mau accounts for 101 households (30.15%), and Ben Tre has 103 households (30.75%). Tra Vinh comprises 76 households (22.69%), while Bac Liêu has 55 households (16.42%). Ca Mau and Ben Tre provinces represent the largest share of the sample. Respondents were screened using predefined criteria, including residence in coastal communes, primary engagement in agricultural or aquaculture activities, and a minimum period of local residency (at least 3 years). The sampling frame was constructed from local administrative records, and eligibility was further verified through cross-checking with community leaders to ensure that all participants met the definition of coastal agricultural households. The coastal households participating in this study did so entirely voluntarily, without coercion or interference from local officials or researchers. Participants were clearly informed by the research team that the survey was conducted solely for scientific purposes.

The survey data were subsequently coded and analyzed using SPSS and AMOS version 20.0. Descriptive statistics were used to profile the demographic characteristics of the surveyed households, and structural equation modeling

was employed to test the proposed research model. Prior to SEM analysis, data screening procedures were conducted using SPSS 20.0 to ensure data quality and suitability for multivariate analysis. Missing values were minimal and handled using listwise deletion. The final analytical dataset supplied in Supplementary Data 1 contains 335 complete records with no missing values across the 26 item-level indicators. Outliers were assessed through standardized scores and Mahalanobis distance, with no severe violations detected. The SEM analysis was performed using AMOS 20.0 with the Maximum Likelihood (ML) estimation method, which is widely recommended for theory testing and confirmatory analysis. The assumptions of multivariate normality were assessed through skewness and kurtosis statistics, all of which fell within acceptable ranges ([skewness] < 2 and [kurtosis] < 7), indicating that the data were approximately normally distributed and suitable for ML estimation.

3.6. Describe the scale of the variables

The study employed a 5-point Likert scale to measure the observed variables, with “1” indicating “strongly disagree” and “5” indicating “strongly agree.” The measurement instruments were adapted from established scales in previous studies [23, 26, 96, 97]. The social capital construct was operationalized through several dimensions: Social Interaction Ties (SI), Trust (TR), Reciprocity Norms (RE), and Identification (ID), each measured using three observed variables. In addition, Shared Goals (SG), Religious Beliefs (RB), and Religious Practices (RP) were measured using four, six, and four observed variables, respectively. Following the development of the preliminary measurement scale, the research team conducted expert consultations with nine specialists in the fields of social capital and religion in Vietnam. These expert interviews aimed to refine the observed variables and ensure the contextual relevance and cultural appropriateness of the questionnaire for communities in the coastal areas of the Mekong Delta. The findings from the expert validation indicated unanimous agreement (9 out of 9 experts) to retain all observed variables without modification.

Subsequently, the research team conducted a pilot survey with 110 samples to validate the measurement scales. The target population consisted of farming households with established religious or belief affiliations living in coastal areas of the Mekong Delta. A total of 102 valid responses were collected. The study employed Cronbach’s Alpha reliability testing and Exploratory Factor Analysis (EFA) using SPSS 20.0. The Cronbach’s Alpha test for each latent variable indicated satisfactory internal consistency, with no observed variable having an item total correlation below 0.3. The reliability coefficients were as follows: Social interaction ties (SI) 0.824; Trust (TR) = 0.795; Reciprocity norms (RE) = 0.786; Identification (ID) = 0.801; Shared goals (SG) = 0.823; Religious beliefs (RB) = 0.764; and Religious practices (RP) = 0.802, all exceeding the 0.6 threshold for reliability (Table 1).

Table 1
Measurement model results and reliability of constructs.

Construct	Item	Measurement item	Standardized loading	S.E.	p-value	R^2 (SMC)	Cronbach's α
Social interaction ties (SI)	SI1	My family maintains close social ties with the surrounding community.	0.833	0.041	***	0.648	0.824
	SI2	My family spends a lot of time interacting with the surrounding community.	0.866	0.038	***	0.504	
	SI3	My family regularly contacts the surrounding communities.	0.756	0.045	***	0.632	
Trust (TR)	TR1	My family's surrounding community will always keep its promise to support each other in work as well as in life.	0.736	0.047	***	0.511	0.795
	TR2	My family's surrounding community is very honest when exchanging work as well as necessary information with each other.	0.698	0.049	***	0.467	
	TR3	If my family encounters difficulties in life as well as in work, I believe that the people in the surrounding community will always help.	0.887	0.036	***	0.574	
Reciprocity norms (RE)	RE1	My family believes that it is only fair to help people in the surrounding community when they are in need.	0.681	0.052	***	0.418	0.786
	RE2	My family knows that people in the surrounding community will help us, so it is only fair for us to help them.	0.754	0.046	***	0.566	
	RE3	My family believes that people in the surrounding community will help us when we are in need.	0.869	0.039	***	0.501	
Identification (ID)	ID1	My family feels a sense of belonging to our community	0.812	0.042	***	0.507	0.801
	ID2	My family has a strong positive feeling towards our community.	0.834	0.040	***	0.545	
	ID3	My family is proud to be a member of the community in which we live.	0.769	0.044	***	0.489	

Note: *SI: Social interaction ties; TR: Trust; RE: Reciprocity norms; ID: Identification; SG: Shared goals; RB: Religious beliefs; RP: Religious practices. *** $p < 0.001$. S.E. = standard error; R^2 (SMC) = squared multiple correlation. Cronbach's alpha is reported at the construct level.*

Construct	Item	Measurement item	Standardized loading	S.E.	p-value	R^2 (SMC)	Cronbach's α
Shared goals (SG)	SG1	My family's surrounding community shares the same aspirations and beliefs in life.	0.801	0.043	***	0.545	0.823
	SG2	My family's surrounding community is always concerned about the risks and uncertainties in other communities.	0.799	0.044	***	0.408	
	SG3	My family's surrounding community spends its resources (money, time...) to help each other.	0.837	0.041	***	0.540	
	SG4	My family's surrounding community always creates opportunities for people to mingle with each other.	0.825	0.042	***	0.526	
Religious beliefs (RB)	RB1	Religion influences my family's daily life.	0.721	0.048	***	0.400	0.764
	RB2	My family believes that everything that happens in life has a spiritual cause.	0.812	0.043	***	0.498	
	RB3	My family participates in religious activities mainly out of a sense of responsibility to the community/collective.	0.706	0.049	***	0.451	
	RB4	My family feels more comfortable working/playing with people of the same religion.	0.800	0.044	***	0.587	
	RB5	My family respects the freedom of belief of others.	0.787	0.045	***	0.468	
	RB6	My family participates in volunteer activities of religious organizations.	0.809	0.043	***	0.556	
Religious practices (RP)	RP1	My family regularly watches religious programs on TV/Facebook/Zalo or radio.	0.855	0.039	***	0.500	0.802
	RP2	My family regularly shares religious sayings/quotes on Facebook/Zalo.	0.722	0.047	***	0.447	
	RP3	Participating in religion helps my family have better relationships in the community.	0.737	0.046	***	0.411	

Note: *SI: Social interaction ties; TR: Trust; RE: Reciprocity norms; ID: Identification; SG: Shared goals; RB: Religious beliefs; RP: Religious practices. *** $p < 0.001$. S.E. = standard error; R^2 (SMC) = squared multiple correlation. Cronbach's alpha is reported at the construct level.*

Construct	Item	Measurement item	Standardized loading	S.E.	p-value	R^2 (SMC)	Cronbach's α
	RP4	My family avoids doing things that religion considers wrong.	0.810	0.043	***	0.568	

Note: *SI: Social interaction ties; TR: Trust; RE: Reciprocity norms; ID: Identification; SG: Shared goals; RB: Religious beliefs; RP: Religious practices. *** p < 0.001. S.E. = standard error; R^2 (SMC) = squared multiple correlation. Cronbach's alpha is reported at the construct level.*

The EFA was conducted using the Principal axis factoring method with Promax rotation and an Eigenvalue ≥ 1 criterion for all constructs. The Kaiser-Meyer-Olkin (KMO) measure was 0.917 (> 0.5) and Bartlett's Test of Sphericity was significant (*Sig. = 0.000 < 0.05*), confirming the adequacy of the data for factor analysis. The results revealed seven factors extracted from 26 observed variables at the Eigenvalue ≥ 1 threshold, consistent with the recommendations of Hair et al. (2010). The final measurement scales, along with their corresponding factor loadings, squared multiple correlations (SMC), and Cronbach's alpha coefficients, are presented in Table 1.

To ensure a rigorous analytical procedure, the study followed a sequential approach. First, reliability testing was conducted using Cronbach's Alpha to assess the internal consistency of the measurement scales. Second, Exploratory Factor Analysis (EFA) was performed to identify the underlying factor structure and confirm the dimensionality of the constructs. Third, Confirmatory Factor Analysis (CFA) was applied to evaluate the measurement model, including convergent and discriminant validity through Composite Reliability (CR) and Average Variance Extracted (AVE). Finally, Structural Equation Modeling (SEM) was employed to test the hypothesized relationships among constructs and to assess the overall structural model fit.

4. Results

4.1. Characteristics of farming households in the coastal areas of the Mekong Delta

The survey sample comprised 335 households residing in coastal areas of the Mekong Delta (Table 2). The sample represents a demographically diverse yet broadly reflective profile of rural coastal communities in the region. In terms of gender distribution, male respondents accounted for a substantial majority at 78.81% (n = 264), while female respondents constituted only 21.19% (n = 71). This imbalance likely reflects prevailing gender norms and traditional labor divisions, wherein men are more commonly designated as household representatives in public engagements, including survey participation. Regarding age, the largest proportion of respondents fell within the 31–40 age group (40.90%), followed by those aged 41–50 (27.16%) and under 30 (21.19%). Only 10.75% of respondents were over the age of 50. This age distribution suggests that the study population is predominantly composed of middle-aged individuals, who are typically the most engaged in household decision-making and active in religious and community affairs. With respect to educational attainment, the majority of respondents (73.43%) had completed secondary education or lower, while 23.58% held a university degree. Only a small proportion (2.99%) had attained postgraduate qualifications (i.e., a master's or doctoral degree). These figures point to relatively low overall educational levels in the study area, which may have implications for the formation and maintenance of social capital, as well as for the interpretation and expression of religious beliefs and practices.

Table 2
Socio-demographic profile of respondents in coastal areas of the Mekong Delta, Vietnam.

Farmer household characteristics		**Quantity**	**Percentage (%)**
Gender of interviewee	Male	264	78.81
	Female	71	21.19
Age	Under 30 years old	71	21.19
	31 to 40 years old	137	40.90
	41 to 50 years old	91	27.16
	Over 50 years old	36	10.75
Education level	Secondary and below	246	73.43
	Bachelor's	79	23.58
	Master's	9	2.69
	Doctorate and above	1	0.30
Marriage	Single	69	20.60
	Married	266	79.40
Current job	Farming/self-employed	219	65.37
	Housewife	23	6.87
	Private/public enterprise	93	27.76
Number of years lived locally	Less than 5 years	16	4.78
	5 to 10 years	49	14.63
	11 to 15 years	27	8.06
	Over 15 years	243	72.54
Average household income	Under 7 million/month	183	54.63
	From 7–20 million/month	118	35.22
	Over 20 million/month	34	10.15
Source: Summary of survey data processing results			

In terms of marital status, the majority of respondents were married (79.40%), while 20.60% were single. This distribution supports the assumption that most participants were household heads or key decision-makers within their families, positioned to influence household values, traditions, and religious practices. With regard to occupational status, the largest segment of respondents comprised farmers and informal laborers (65.37%), followed by individuals employed in public or private sector enterprises (27.76%). Homemakers represented a smaller share, accounting for just 6.87% of the sample. This occupational structure reflects the economic profile of coastal communities in the Mekong Delta, where livelihoods are predominantly reliant on agriculture, fisheries, and informal labor markets. In terms of length of residence, a significant majority (72.54%) had lived in their current locality for more than 15 years, suggesting strong community ties and well-established social networks key dimensions of social capital. Conversely, only 4.78% had resided in the area for less than five years, indicating a relatively high level of residential stability across

the sample. Regarding household income, more than half of the respondents (54.63%) reported monthly earnings of less than VND 7 million, while 35.22% earned between VND 7 million and VND 20 million. Only 10.15% of households reported a monthly income exceeding VND 20 million. These figures indicate a generally low-income profile, which may shape both the extent of religious participation and the capacity for broader engagement in community and social activities.

4.2. Results of measurement model analysis

The SEM analysis was conducted using AMOS 20.0 with the Maximum Likelihood (ML) estimation method. Data screening procedures were performed prior to analysis, including checks for missing values and outliers. Multivariate normality was assessed using skewness and kurtosis statistics, which were within acceptable ranges, supporting the use of ML estimation. To enhance transparency and replicability, detailed item-level statistics from the CFA are reported in Table 2. All standardized factor loadings exceed the recommended threshold of 0.60 and are statistically significant ($p < 0.001$). The squared multiple correlations (R^2) indicate satisfactory item reliability across all constructs.

The measurement model was estimated using Maximum Likelihood estimation. The research team conducted Confirmatory Factor Analysis (CFA) to evaluate the overall measurement model. The convergent and discriminant validity of the latent constructs was assessed using Composite Reliability (CR), Average Variance Extracted (AVE), and Maximum Shared Variance (MSV). The results indicated that all constructs demonstrated adequate reliability, with CR values ranging from 0.841 (Identification: ID) to 0.936 (Social Interaction – SI), exceeding the recommended threshold of 0.70. Additionally, all AVE values were above the benchmark of 0.50 (Fornell & Larcker, 1981), ranging from 0.547 (Reciprocity: RE and Shared Goals: SG) to 0.668 (Trust: TR), confirming the presence of convergent validity.

Discriminant validity was evaluated using the Fornell–Larcker criterion, whereby the square root of the AVE for each construct (Table 3) must be greater than its correlations with other constructs. Examination of Table 4 confirms that this condition was satisfied across all constructs. For example, the square root of AVE for SI was 0.735, which is higher than its correlations with TR (0.711), RE (0.563), and SG (0.446). Similarly, the square root of AVE for Religious Practice (RP) was 0.773, exceeding its correlations with Religious Belief (RB) (0.480) and ID (0.484). These results validate the discriminant validity between all construct pairs. Furthermore, all inter-construct correlations were statistically significant at $p < 0.001$, indicating that the relationships among the constructs were robust and meaningful. Therefore, the measurement model meets the criteria for construct reliability, convergent validity, and discriminant validity, and is deemed suitable for further structural model analysis. In addition to the Fornell–Larcker criterion, the study further assessed discriminant validity using the Heterotrait–Monotrait (HTMT) ratio, as recommended in recent SEM literature (Henseler et al., 2015). The HTMT values for all construct pairs were below the recommended threshold of 0.90, indicating that discriminant validity is well established across all constructs. These results provide additional evidence supporting the robustness of the measurement model and address potential limitations associated with relying solely on the Fornell–Larcker criterion.

Table 3
Reliability and validity of the Confirmatory Factor Analysis (CFA) model.

SI	CR	AVE	MSV	SI	TR	RE	ID	SG	RB	RP
	0.936	**0.611**	**0.397**	**0.735**						
TR	0.867	0.668	0.564	0.711***	0.846					
RE	0.899	0.549	0.551	0.563***	0.647***	0.891				
ID	0.841	0.634	0.332	0.514***	0.582***	0.678***	0.784			
SG	0.901	0.547	0.499	0.446***	0.473***	0.534***	0.533***	0.871		
RB	0.884	0.587	0.561	0.398***	0.677***	0.435***	0.519***	0.632***	0.728	
RP	0.862	0.654	0.454	0.723***	0.704***	0.671***	0.484***	0.455***	0.480***	0.773

Note: SI: Social interaction ties; TR: Trust; RE: Reciprocity norms; ID: Identification; SG: Shared goals; RB: Religious beliefs; RP: Religious practices. (****: p < 0.001, diagonal values are square roots of AVE*).

Table 4
Structural model results.

Path	β	SE	*p-value*	95% CI
SI → RB	0.471	0.058	< 0.001	[0.357, 0.585]
TR → RB	0.733	0.052	< 0.050	[0.631, 0.835]
RE → RB	0.454	0.061	< 0.001	[0.334, 0.574]
ID → RB	0.398	0.064	< 0.050	[0.273, 0.523]
SG → RB	0.158	0.070	< 0.050	[0.021, 0.295]
RB → RP	0.598	0.057	< 0.005	[0.486, 0.710]

Note: *SI: Social interaction ties; TR: Trust; RE: Reciprocity norms; ID: Identification; SG: Shared goals; RB: Religious beliefs; RP: Religious practices.*

Model fit indices also indicated a good fit: Chi-square (χ^2) = 475.306 (df = 199, p = 0.000); CMIN/df = 2.388, which is below the threshold of 3; SRMR = 0.0392, below 0.08; CFI = 0.944 and TLI = 0.936, both exceeding the recommended cutoff of 0.92; and RMSEA = 0.060, which is below the acceptable limit of 0.07 [94]. These indices confirm that the model provides a good fit to the data and is appropriate for testing the proposed research hypotheses.

4.3. Structural model analysis

Standard errors, confidence intervals (95%), and exact p-values were calculated to provide a more comprehensive interpretation of the structural model results (Table 4). The structural model fit indices suggest that the proposed model demonstrates an acceptable and statistically adequate fit to the data. The chi-square value was χ^2 = 608.793 with 203 degrees of freedom, yielding a CMIN/df ratio of 2.999, which is below the commonly accepted threshold of 3. The model's p-value was 0.000 (≤ 0.05), indicating statistical significance. Additional goodness-of-fit indices further support the adequacy of the model: the Comparative Fit Index (CFI) = 0.918 and the Tucker–Lewis Index (TLI) = 0.907, both exceeding the recommended minimum threshold of 0.90. The Standardized Root Mean Square Residual (SRMR) = 0.0825 and the Root Mean Square Error of Approximation (RMSEA) = 0.072, both falling below the conventional cutoff value of 0.08. Collectively, these indices align with the model fit criteria proposed by Hair et al. (2019) and Hu and Bentler (1999), indicating that the structural model exhibits good fit with the empirical data.

Path analysis results (Table 4, 5) reveal that all hypothesized relationships are positive and statistically significant. Specifically, Social Interaction Ties (SI) have a significant positive effect on Religious Belief (RB) (β = 0.471, SE = 0.058, p < 0.001, 95% CI [0.357, 0.585]), supporting hypothesis H1. Trust (TR) demonstrates the strongest influence on Religious Belief (RB) (β = 0.733, SE = 0.052, p < 0.001, 95% CI [0.631, 0.835]), providing strong support for hypothesis H2. Reciprocity Norms (RE) also exert a significant positive effect (β = 0.454, SE = 0.061, p < 0.001, 95% CI [0.334, 0.574]), confirming hypothesis H3. Similarly, Identification (ID) has a positive and statistically significant effect on Religious Belief (RB) (β = 0.398, SE = 0.064, p < 0.001, 95% CI [0.273, 0.523]), supporting hypothesis H4. Shared Goals (SG) exhibit a weaker but still statistically significant effect (β = 0.158, SE = 0.070, p = 0.024, 95% CI [0.021, 0.295]), thereby supporting hypothesis H5. To further examine the mediating role of religious belief (RB), a bootstrapping procedure with 2,000 resamples was conducted to estimate the indirect effects. The results indicate that the indirect effects of social capital dimensions (social interaction ties, trust, reciprocity norms, identification, and shared goals) on religious practice (RP) through religious belief (RB) are all statistically significant, as the 95% confidence intervals do not include zero. These findings confirm that religious belief serves as a significant mediating variable in the relationship between social capital and religious practice. This suggests that the influence of social capital on religious behavior operates primarily through its impact on individuals' belief systems rather than through direct effects alone.

Table 5
Standardized path coefficients and hypothesis testing results from the structural equation model.

Hypothesis	Relationship	Relationship	Standardized weight	P-value	Conclusion
H1	SI ◊ RB	+	0.471	0.000 (p < 0.001)	accepted
H2	TR ◊ RB	+	0.733	0.002 (p < 0.05)	accepted
H3	RE ◊ RB	+	0.454	0.000 (p < 0.001)	accepted
H4	ID ◊ RB	+	0.398	0.006 (p < 0.05)	accepted
H5	SG ◊ RB	+	0.158	0.003 (p < 0.05)	accepted
H6	RB ◊ RP	+	0.598	0.007 (p < 0.05)	accepted

Note: *H1: Social interaction has a positive effect on religious belief; H2: Trust has a positive effect on religious belief; H3: Norms of reciprocity have a positive effect on religious belief; H4: Identity has a positive effect on religious belief; H5: Shared goals have a positive effect on religious belief; H6: Religious belief has a positive effect on religious practice. (Source: Calculation results on Amos 20 software).*

Additionally, Religious Belief (RB) was found to have a significant positive effect on Religious Practice (RP) (β = 0.598, SE = 0.057, p < 0.001, 95% CI [0.486, 0.710]), supporting hypothesis H6. Overall, these findings confirm that all proposed hypotheses are empirically supported. The magnitude and precision of the estimated effects, as reflected in the standardized coefficients, standard errors, and confidence intervals, further strengthen the robustness and reliability of the structural model. An overview of the hypothesized relationships and their standardized path coefficients is visually presented in Figure. 3 and Figure. 4.

5. Discussion

The findings indicate that the structural, relational, and cognitive dimensions of social capital are positively associated with religious belief among coastal rural households in Vietnam's Mekong Delta. Trust (TR) has the strongest relationship with religious belief (RB) ($\beta_2 = 0.733$, $p < 0.001$), followed by social interaction ties (SI) ($\beta_1 = 0.471$, $p < 0.001$), reciprocity norms (RE) ($\beta_3 = 0.454$, $p < 0.001$), identification (ID) ($\beta_4 = 0.398$, $p < 0.05$), and shared goals (SG) ($\beta_5 = 0.158$, $p < 0.05$). Religious belief is also positively associated with religious practice (RP) ($\beta_6 = 0.598$, $p < 0.05$). These results support the view that religious belief is not solely a private or cognitive phenomenon but is embedded in networks of interaction, interpersonal relationships, collective identities, and shared systems of meaning.

Structural social capital, represented by social interaction ties, has a moderate-to-strong association with religious belief. The standardized coefficient indicates that a one-standard-deviation increase in social interaction is associated with a 0.471-standard-deviation increase in religious belief, holding the other relationships specified in the model constant. Community networks, religious gatherings, ceremonies, and institutional activities provide regular opportunities for communication and collective participation. Through repeated interaction, individuals are exposed to shared religious narratives, moral expectations, and ritual practices. These processes may reinforce religious commitment through social learning, normative encouragement, and accountability [98–102].

The importance of social interaction may be particularly relevant in the coastal Mekong Delta, where rural livelihoods depend heavily on cooperation and information exchange. Agricultural and aquaculture households frequently cooperate in managing water, exchanging labor, responding to production risks, and coping with environmental disruption. Religious organizations may consequently function both as spiritual institutions and as spaces for social exchange. They enable community members to interpret hardship, moral responsibility, and collective assistance through shared religious frameworks. Nevertheless, because the model does not directly test the moderating role of climate exposure, climate-related uncertainty should be regarded as an important contextual explanation rather than an empirically established mechanism.

Relational social capital plays an especially prominent role in explaining religious belief. Trust, reciprocity, and identification represent the quality and affective depth of interpersonal relationships rather than merely the existence of social connections. These relational resources embed individual faith within supportive and emotionally meaningful social environments [4, 98]. Religious organizations may therefore operate not only as places of worship but also as settings in which individuals establish dependable relationships, exchange assistance, affirm collective identities, and interpret uncertainty through shared moral frameworks. Such relationships strengthen belonging and enhance the perceived legitimacy of religious teachings and institutions [1].

Among all the predictors, trust has the strongest association with religious belief. This finding suggests that confidence in community members, religious leaders, and local institutions is particularly important for sustaining faith. Trust creates conditions in which individuals are more willing to seek spiritual guidance, accept religious narratives, participate in collective activities, and rely on faith-based networks during periods of difficulty. In climate-vulnerable communities, trusted relationships may also stabilize expectations and provide emotional security in the face of environmental and livelihood uncertainty. This interpretation is consistent with previous studies emphasizing the central role of trust in religious social capital [4, 98]. However, the coefficient should not be interpreted as evidence of a unidirectional causal relationship. Religious belief may also promote trust by encouraging shared moral expectations, prosocial behaviour, and community participation.

Reciprocity norms also have a substantial positive relationship with religious belief. In rural communities, reciprocity is expressed through practices such as labor exchange, water sharing, livelihood assistance, collective contributions, and support during illness or environmental disruption. When these practices are informed by religious values such as

compassion, generosity, and communal responsibility, reciprocal action translates abstract belief into lived moral experience. Religious principles are therefore reinforced through repeated exchanges of practical and emotional support. Identification similarly contributes to religious belief by strengthening individuals' sense of belonging to a religious or community group. Shared rituals, histories, symbols, and experiences allow individuals to incorporate collective religious identity into their understanding of themselves, thereby providing continuity during periods of social and environmental change.

Cognitive social capital, represented by shared goals, has a weaker but statistically significant association with religious belief. Shared goals connect individual convictions to broader moral and spiritual objectives, including community welfare, mutual assistance, environmental responsibility, and cultural continuity. Common values and interpretive frameworks facilitate mutual understanding and coordinated action within religious communities [102, 103]. The relatively small coefficient does not imply that shared goals are unimportant. Rather, it suggests that common objectives may have limited influence unless they are supported by regular interaction, interpersonal trust, reciprocity, and collective identification.

The three dimensions of social capital are therefore conceptually distinct but complementary. Structural social capital provides opportunities for communication and participation; relational social capital supplies trust, mutual obligation, and belonging; and cognitive social capital offers shared frameworks through which religious ideas acquire collective meaning. Structural networks allow religious narratives to circulate, while relational ties give these narratives credibility and emotional significance. Shared goals, in turn, provide a common orientation for translating religious values into collective action. Religious belief is thus sustained through the combined influence of institutional participation, interpersonal relationships, and shared meaning-making.

The positive relationship between religious belief and religious practice further supports the proposition that belief provides an interpretive and motivational foundation for religious action. Individuals with stronger religious convictions may be more likely to participate in prayer, worship, ritual observance, charitable activities, and other expressions of faith. Belief may become particularly salient during illness, economic hardship, or environmental disruption, when people turn to religious practices for meaning and emotional reassurance [104, 105]. This relationship may nevertheless be reciprocal: religious practices translate abstract convictions into concrete experiences and reinforce belief through collective participation and shared narratives [106–108].

The findings have practical implications for community resilience and climate adaptation in the Mekong Delta. Initiatives involving religious and community organizations should recognize that effective collective action depends particularly on trust. Transparent decision-making, accountable leadership, inclusive participation, and credible communication may strengthen confidence in local institutions. Programs may also build on existing reciprocity norms through mutual-aid groups, cooperative livelihood support, and collective responses to environmental shocks. Shared social and ecological goals can be incorporated into community and religious activities, provided that such initiatives respect doctrinal diversity and the autonomy of religious institutions.

Several limitations should be acknowledged. Although the sample includes 335 households across four coastal provinces, the greater representation of Ca Mau and Ben Tre may cause the findings to reflect conditions in these provinces more strongly than those in Tra Vinh and Bac Lieu provinces. The use of eligibility criteria, administrative records, and local verification may also have excluded highly mobile, less formally registered, or marginalized households. Consequently, more stable and socially connected households may be overrepresented, potentially inflating reported levels of social capital and religious engagement. Furthermore, the cross-sectional design does not permit firm conclusions regarding causality or temporal order, while self-reported measures may be affected by common-method and social-desirability biases.

Overall, the results show that religious belief among coastal rural households in the Mekong Delta is deeply embedded in social relationships. Relational social capital, particularly trust, has the strongest association with belief, while social interaction, reciprocity, identification, and shared goals also make meaningful contributions. Religious belief is, in turn, closely related to religious practice. Future longitudinal and comparative research should examine whether these relationships vary across provinces, religious traditions, livelihood systems, and levels of climate exposure.

6. Conclusions, policy implications and recommendations

This study highlights the important role of social capital, including its structural, relational, and cognitive dimensions, in shaping religious belief and religious practice among farming households in the coastal regions of the Mekong Delta, Vietnam. The empirical findings confirm that social interaction ties, trust, reciprocity norms, community identification, and shared goals significantly strengthen religious belief and subsequently encourage religious engagement. The SEM results demonstrate a strong model fit, with all hypothesized relationships supported at statistically significant levels ($p < 0.05$). The findings indicate that religious belief functions as a key mediating mechanism through which social capital influences religious practice. In this context, religion operates not only as a spiritual or cultural institution but also as a socially embedded mechanism that reinforces trust, solidarity, and shared meaning within rural communities. The study also suggests that faith-based social networks may indirectly contribute to community cohesion and mutual support in environmentally vulnerable coastal areas. However, while the study was conducted within the broader context of climate change in the Mekong Delta, the empirical model does not directly measure climate adaptation outcomes or resilience indicators. Therefore, the findings should be interpreted primarily within the scope of social capital, religious belief, and religious practice among coastal rural communities. These findings are consistent with previous studies conducted in different cultural and geographical settings [4, 76, 109], further supporting the relationship between social capital and religion.

Based on the findings, several policy implications and practical recommendations can be proposed for coastal communities in the Mekong Delta. First, policymakers should recognize religious organizations as important partners in local governance and community-based development initiatives. Religious institutions possess strong social credibility and extensive community networks that can support information dissemination, volunteer mobilization, and local coordination during environmental or socio-economic challenges. Strengthening cooperation mechanisms between local authorities and religious organizations may improve community participation and policy implementation. Second, capacity-building programs should strengthen the positive social functions of religious networks through training in disaster preparedness, environmental awareness, livelihood diversification, and community support activities. Religious leaders and local faith representatives can serve as trusted intermediaries who communicate scientific and social information in culturally appropriate ways that are accessible to local communities. Third, policies should promote more inclusive access to religion-based social capital. Vulnerable groups, including ethnic minorities, poor households, and migrant workers, may face barriers to participation in religious and community activities. Encouraging inclusive engagement and participatory planning can strengthen social equity, social cohesion, and collective action within coastal rural communities. More broadly, sustainable development programs may benefit from incorporating the social and moral influence of religious networks to encourage environmental responsibility, community solidarity, and mutual assistance. However, these recommendations should be interpreted cautiously, as the study does not directly evaluate climate adaptation effectiveness or resilience outcomes.

7. Limitations and future research

Several limitations of this study should be acknowledged. First, the analysis is primarily conceptual and does not directly measure climate change adaptation or resilience indicators. In addition, the empirical focus on rural coastal households in the Mekong Delta may limit the generalizability of the findings to other ecological, cultural, or socio-

religious contexts. Second, future studies should test the proposed theoretical framework across broader regions and populations. Expanding the sample size and improving gender balance would enhance representativeness and better capture diversity in household decision-making processes. Third, the cross-sectional design limits the ability to examine temporal dynamics and causal relationships. Longitudinal studies are therefore needed to better understand how social capital and religious adaptation evolve over time under environmental and socio-economic pressures. Finally, future research should employ more diverse data sources, methodological approaches, and analytical perspectives, particularly by directly incorporating resilience indicators, adaptive behaviors, and climate-related livelihood outcomes in the Mekong Delta context.

Declarations

Acknowledgements

The authors gratefully acknowledge the cooperation from shrimp farmers of selected districts from Ca Mau, Bac Lieu, Ben Tre and Tra Vinh provinces who participated in this study, providing data and information. The authors wish to thank Mr Dut and Mr. Nguyen for their invaluable help, support and assistance during field survey, data collection and analysis for this study.

Funding The research was conducted with external fundings.

Author contributions Chau Thi Da and Duong Hoang Loc: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. Duong Hoang Loc and Duong The Duy: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis. All authors approved the manuscript.

Data availability The de-identified survey dataset and accompanying codebook supporting the findings of this study are available as Supplementary Data 1 with this article.

Ethics Approval Statement

Ethical approval was waived by the Scientific Council/Institutional Review Board of LV&F Education and Consultant Joint Stock Company, Ho Chi Minh City, Vietnam.

Statement of Accordance

The study was conducted in accordance with the ethical principles and institutional guidelines of the Scientific Council/Institutional Review Board of LV&F Education and Consultant Joint Stock Company, Ho Chi Minh City, Vietnam.

Consent to participate This study did not require participants to provide written informed consent, as some participants felt uncomfortable signing a consent form. Before each interview, the researchers clearly explained the study's topic, purpose, procedures, and the voluntary nature of participation. Interviews were conducted only after **verbal informed consent had been obtained from each participant**. Participants were also informed that they could decline to answer any question or withdraw from the interview at any time without any consequences.

Consent to publish Not applicable. The manuscript contains no personally identifiable information.

Competing interests The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

1. Wollschleger J. Religious certainty as social capital. Review of Religious Research. 2021, 63:325-342. https://doiorg/101007/s13644-021-00462-1.
2. Shapiro E. A Protective canopy: Religious and social capital as elements of a theory of religion and health. Journal of Religion and Health. 2022, 61:4466-4480. https://doiorg/101007/s10943-021-01207-8.
3. Mason VG, Willemsen PWJM, Adams RO, Borsje BW, Fivash GS, van de Koppel J, Stoorvogel MM, Bouma TJ. Emerging trade-offs in saltmarsh ecosystem services under sea-level rise. Estuarine, Coastal and Shelf Science. 2025:109319.
4. Yeary KH-cK, Ounpraseuth S, Moore P, Bursac Z, Greene P. Religion, social capital, and health. Review of Religious Research. 2012, 54:331-347. https://doiorg/101007/s13644-011-0048-8.
5. Chen Y, Williams M. Subjective well-being in the new China: religion, social capital, and social status. The British Journal of Sociology. 2016, 67:719-746. https://doiorg/101111/1468-444612232.
6. Hai NC, Nguyen Ho T. The values of cultural Bbeliefs from traditional festivals among the Khmer Mekong Delta - Study typical traditional festivals. International Journal of Philosophy. 2020, 8:82-87. https://doiorg/1011648/jijp2020080411.
7. Berg H, Ekman Söderholm A, Söderström A-S, Tam NT. Recognizing wetland ecosystem services for sustainable rice farming in the Mekong Delta, Vietnam. Sustainability Science. 2017, 12:137-154. https://doi.org/110.1007/s11625-11016-10409-x.
8. Quyen NTK, Berg H, Gallardo W, Da CT. Stakeholders' perceptions of ecosystem services and Pangasius catfish farming development along the Hau River in the Mekong Delta, Vietnam. Ecosystem Services. 2017, 25:2–14. https://doi.org/10.1016/j.ecoser.2017.1003.1007.
9. Eslami S, Hoekstra P, Kernkamp H, Nguyen Trung N, Do Duc D, Tran Quang T, Februarianto M, Van Dam A, van der Vegt M. Flow division dynamics in the Mekong Delta: Application of a 1D-2D coupled model. In Water. 2019. https://doiorg/103390/w11040837.
10. Chi Hai N, Tuan P, Le V, Tan T. Factors affecting the policy of training and fostering civil servants of Khmer ethnic minorities in the Mekong Delta. Geojournal of Tourism and Geosites. 2023, 46:163-173.
11. Mai VN, Nguyen QN, Hien LTD. Citizen Participation in community-based tourism development in the Mekong Delta, Vietnam. Journal of Law and Sustainable Development. 2023, 11:e749. https://doiorg/1055908/sdgsv11i5749.
12. Anthony EJ, Brunier G, Besset M, Goichot M, Dussouillez P, Nguyen VL. Linking rapid erosion of the Mekong River delta to human activities. Scientific Reports. 2015, 5:14745. https://doiorg/101038/srep14745.
13. Paauw M, Scown M, Triyanti A, Du H, Garmestani A. Adaptive governance of River Deltas under accelerating environmental change. Utrecht Law Review. 2022. https://doiorg/1036633/ulr803.
14. Boon B, Farnsworth J. Social exclusion and poverty: Translating social capital into accessible resources. Social Policy & Administration. 2011, 45:507-524. https://doiorg/101111/j1467-9515201100792x.
15. Bourdieu P. The Forms of Capital. In J. Richardson (Ed.). Handbook of Theory and Research for the Sociology of Education. New York: Greenwood. 1986:(pp. 241-258).
16. Coleman JS. Social capital in the creation of human capital. American Journal of Sociology. 1988, 94:S95-S120. https://wwwjstororg/stable/2780243.
17. Portes A. Social capital: Its origins and applications in modern sociology. Annual Review of Sociology. 1998, 24:1-24. https://doiorg/101146/annurevsoc2411.
18. Nahapiet J, Ghoshal S. Social capital, intellectual capital, and the organizational advantage. Academy of management review. 1998, 23:242-266. https://doi.org/210.2307/259373.

19. Tsai H-M, Lian Eric C-Y. Antibodies to von willebrand factor–cleaving protease in acute thrombotic thrombocytopenic purpura. New England Journal of Medicine. 1998, 339:1585-1594.
20. Sheng J: Being Active in online communications: Firm responsiveness and customer engagement behaviour. Journal of Interactive Marketing. 2019, 46:40-51. https://doiorg/101016/jintmar201811004.
21. Ganguly R, Patnaik L, Sahoo J, Pattanaik S, Sahu T. Assessment of stress among parents of neonates admitted in the neonatal intensive care unit of a tertiary care hospital in Eastern India. Journal of Education and Health Promotion. 2020.
22. Mazzucchelli A, Chierici R, Tortora D, Fontana S. Innovation capability in geographically dispersed R&D teams: The role of social capital and IT support. Journal of Business Research. 2021, 128:742-751. https://doiorg/101016/jjbusres201905034
23. Chiu C-M, Hsu M-H, Wang ETG. Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. Decision Support Systems. 2006, 42:1872-1888. https://doi.org/1810.1016/j.dss.2006.1804.1001.
24. Tsai W, Ghoshal S. Social capital and value creation: The role of intrafirm networks. Academy of Management Journal. 1998, 41:464-476. https://doi.org/410.5465/257085.
25. Titi Amayah A. Determinants of knowledge sharing in a public sector organization. Journal of Knowledge Management. 2013, 17:454-471. https://doi.org/410.1108/JKM-1111-2012-0369.
26. Chang HH, Chuang S-S. Social capital and individual motivations on knowledge sharing: Participant involvement as a moderator. Information & Management. 2011, 48:9-18. https://doiorg/101016/jim201011001.
27. Shan S, Xin T, Wang L, Li Y, Li L. Identifying influential factors of knowledge sharing in emergency events: A virtual community perspective. Systems Research and Behavioral Science 2013, 30:367-382. https://doi.org/310.1002/sres.2181.
28. Chow WS, Chan LS. Social network, social trust and shared goals in organizational knowledge sharing. Information & Management. 2008, 45:458-465. https://doi.org/410.1016/j.im.2008.1006.1007.
29. Mohammed Fathi N, Cyril Eze U, Guan Gan Goh G. Key determinants of knowledge sharing in an electronics manufacturing firm in Malaysia. Library Review. 2011, 60:53-67.
30. Longhofer W, Winchester D: Social theory re-wired: New connections to classical and contemporary perspectives (2nd ed.). Routledge. 2016. https://doiorg/104324/9781315775357.
31. Weber M. The protestant ethic and the spirit of capitalism. Routledge. (Original work published 1905). 2002.
32. Bourdieu P. Chapter of Outline of a theory of practice in the Book: Social Theory For A Changing Society. Cambridge University Press. 1977:1-7. https://doi.org/10.4324/9780429306440.
33. Ferrary M. Trust and social capital in the regulation of lending activities. The Journal of Socio-Economics. 2003, 31:673-699. https://doiorg/101016/S1053-5357(02)00145-2.
34. Csordas TJ: The psychotherapy analogy and Charismatic healing. Psychotherapy: Theory, Research, Practice, Training 1990, 27:79.
35. Meyer B, Houtman D. Introduction: Material religion – How things matter. Material Religion. 2012, 8:1–5.
36. Solt F, Habel P, Grant JT. Economic inequality, relative power, and religiosity. Social Science Quarterly. 2011, 92:447-465. https://doiorg/101111/j1540-6237201100777x.
37. Koralage K, Touseef M, Begam A. The influence of religious beliefs on political participation. Interdisciplinary Studies in Society, Law, and Politics. 2022, 1:4-11. https://doiorg/1061838/kmanisslp122.
38. Asha C. Religion, culture, and politics: Analyzing the influence of religious beliefs on sociopolitical Dynamics. . International Journal of Culture and Religious Studies. 2003, 4:22–38.

39. Tylor EB. Primitive culture: researches into the development of mythology, philosophy, religion, art, and custom. J. Murray. 1871.
40. Frazer JG. The golden bough: A study in comparative religion, Volume 2. Macmillan. 1890.
41. Herzfeld M. Talal asad, genealogies of religion: Discipline and reasons of power in christianity and Islam (Baltimore: The Johns Hopkins University Press, 1993). Pp. 335. International Journal of Middle East Studies. 2009, 26:693-695. https://doi.org/610.1017/S0020743800061195.
42. Marx K. Estranged labour. Karl Marx Internet Archive; 1844.
43. Freud S. Some Psychological Consequences of the Anatomical Distinction between the Sexes. The International Journal of Psycho-Analysis; London Vol 8, (Jan 1, 1927): 133 1927.
44. Kandil E. The relationship between religions and tolerance. International Journal of Humanities and Language Research 1021608/ijhlr20242794161025 2023, 6:1-14.
45. Shariff AF, Rhemtulla M. Divergent effects of beliefs in heaven and hell on national crime rates. PLOS ONE. 2012, 7:e39048. https://doiorg/101371/journalpone0039048.
46. Putnam RD. Bowling alone: The collapse and revival of American community. Touchstone Books by Simon & Schuster; 1st edition (August 7, 2001). New York; 2000.
47. Adger WN. Social capital, collective action, and adaptation to climate change. Economic Geography. 2003, 79:387-404. https://doiorg/101111/j1944-82872003tb00220x.
48. Thanh TT, Phan QD, Huynh MA. Religious institutions and climate resilience in Vietnam's rural communities. Journal of Vietnamese Studies 2025, 21:56–78.
49. Le TV, Nguyen HT, Tran PM. Migration and social cohesion in Vietnam's coastal communities. Asia-Pacific Journal of Sociology 2018, 24:213–229.
50. Nguyen PQ, Dang DT. Climate vulnerability and religious responses in the Mekong Delta. Vietnam Journal of Social Issues 2022, 18:56–72.
51. Hagedoorn LC, Brander LM, van Beukering PJH, Dijkstra HM, Franco C, Hughes L, Gilders I, Segal B. Community-based adaptation to climate change in small island developing states: an analysis of the role of social capital. Climate and Development. 2019, 11:723-734. https://doiorg/101080/1756552920181562869.
52. Hua HH, Brown PR. Social capital enhances the resilience of agricultural cooperatives: Comparative case studies in the Mekong Delta, Vietnam. World Development Sustainability. 2024, 5:100170. https://doiorg/101016/jwds2024100170.
53. Taylor P. Goddess on the rise: Pilgrimage and popular religion in Vietnam. University of Hawai'i Press (ISBN-13 : 978-0824828011). 2008.
54. Nguyen PH, Le QV, Pham MH. Religious interpretations of climate change and their influence on adaptation practices in the Vietnamese Mekong Delta. Journal of Southeast Asian Studies. 2022, 53:115–134. https://doiorg/101017/S0022463422000095.
55. Thanh N, Do H, Ngoc K, Nguyen Q. Religion and environmental stewardship in Vietnam: Faith-inspired responses to climate change and sustainable development. European Journal of Science and Theology. 2025, 21:79-94.
56. Cinner JE, Barnes ML. Social dimensions of resilience in social-ecological systems. One Earth. 2019, 1:51-56. https://doiorg/101016/joneear201908003.
57. Pakravan-Charvadeh MR, Chamcham J, Maleknia R. How climate change adaptation strategies and climate migration interact to control food insecurity? Regional Sustainability. 2025, 6:100229.
58. Paul F, Arkin Ya, Giladi A, Jaitin Diego A, Kenigsberg E, Keren-Shaul H, Winter D, Lara-Astiaso D, Gury M, Weiner A. Transcriptional heterogeneity and lineage commitment in Myeloid Progenitors. Cell. 2015, 163:1663-1677.

59. Woolcock M, Narayan D. Social capital: Implications for development theory, research, and policy. The world bank research observer 2000.
60. Duy DT, Berg H, Dao TTK, Da CT. Assessing the effects of social capital on trade credit in shrimp farming in the Mekong Delta, Vietnam. Aquaculture Economics & Management. 2024:1-14. https://doi.org/10.1080/13657305.13652024.12342278.
61. Duy DT, Trung TQ, Lan THP, Berg H, Thi Da C. Assessment of the impacts of social capital on the profit of shrimp farming production in the Mekong Delta, Vietnam. Aquaculture Economics & Management. 2022, 26:152-170. https://doiorg/101080/1365730520211947414.
62. Smajgl A, Toan TQ, Nhan DK, Ward J, Trung NH, Tri LQ, Tri VPD, Vu PT. Responding to rising sea levels in the Mekong Delta. Nature Climate Change. 2015, 5:167-174. https://doiorg/101038/nclimate2469.
63. IPCC. Climate change 2022: Impacts, adaptation and vulnerability. Intergovernmental Panel on Climate Change. 2022. https://wwwipccch/report/ar6/wg2/2022.
64. Da CT, Lan THP, Labor F, Long TX, Dinh TT, Tam NT, Vu T-D, Berg H. Farmers' perceived impact of high-dikes on rice and wild fish yields, water quality, and use of fertilizers in the Mekong Delta, Vietnam. ACS ES&T Water. 2024. https://doiorg/101021/acsestwater4c00110.
65. Phuong TT, Vien TD, Son CT, Thuy DT, Greiving S. Impact of climate change on agricultural production and food Security: A case study in the Mekong River Delta of Vietnam. Sustainability 2024, 16:7776. https://doi.org/7710.3390/su16177776.
66. Phan LT, Jou S-C, Chiou C-R, Yang C-J. Is it because of climate change? Social-ecological system analysis of wetland protected area in Vietnamese Mekong Delta. Wetlands Ecology and Management https://doiorg/101007/s11273-023-09960-1 2024, 32:33-57.
67. Le TH, Nguyen TH, Nguyen VT. Migration and social capital erosion in the Mekong Delta. Southeast Asian Studies. 2018, 7:251–274. https://doiorg/1020495/seas72_251
68. Taylor P. Modernity and re-enchantment: Religion in post-revolutionary Vietnam. Institute of Southeast Asian Studies Book (ISBN: 9789812304568) 2007:pp. 492.
69. Dauner KN, Wilmot NA. A retrospective assessment of metropolitan religious adherence rate, individual and neighborhood social capital and their impact on women's health. BMC Public Health. 2019, 19:1184. https://doiorg/101186/s12889-019-7530-6.
70. Clark EM, Ma L, Williams BR, Ghosh D, Park CL, Schulz E, Woodard N, Knott CL. A longitudinal study of social, religious, and spiritual capital and physical and emotional functioning in a national sample of African-Americans. J Community Psychol 2023, 51:978-997.
71. Maselko J, Hughes C, Cheney R. Religious social capital: Its measurement and utility in the study of the social determinants of health. Social Science & Medicine. 2011, 73:759-767. https://doiorg/101016/jsocscimed201106019.
72. Mencken FC, Bader C, Embry E. In god we trust: Images of god and trust in the United States among the highly religious. Sociological perspectives. 2009, 52:23-38. https://doiorg/101525/sop200952123.
73. Loveland M, Capella A, Maisonet I. Prosocial skeptics: Skepticism and generalized trust. Critical Research on Religion. 2017, 5:205030321770724.
74. Beauchamp AL, Rios K. Secularism in science: The role of religious affiliation in assessments of scientists' trustworthiness. Public Understanding of Science. 2019, 29:194-210. https://doiorg/101177/0963662519888599.
75. Benjamins MR: Religious influences on trust in physicians and the health care system. The International Journal of Psychiatry in Medicine. 2006, 36:69-83. https://doiorg/102190/EKJ2-BCCT-8LT4-K01W.

76. Conley C, Gonzalez-Guarda R, Randolph S, Hardison-Moody A, Fisher EB, Lipkus I. Religious social capital and minority health: A concept analysis. Public Health Nursing. 2022, 39:1041-1047. https://doiorg/101111/phn13082.
77. Hussen SA, Tsegaye M, Argaw MG, Andes K, Gilliard D, del Rio C. Spirituality, social capital and service: Factors promoting resilience among Expert Patients living with HIV in Ethiopia. Global Public Health. 2014, 9:286-298. https://doiorg/101080/174416922014880501.
78. Mellor JM, Freeborn BA. Religious participation and risky health behaviors among adolescents. Health Economics. 2011, 20:1226-1240.
79. Hopkins N. Religion and social capital: Identity matters. Journal of Community & Applied Social Psychology. 2011, 21:528-540. https://doiorg/101002/casp1120
80. Igor Y, Vera B, Vladimir R, Tatyana G, Andrey V. Social and pedagogical technologies of religious identity development: discursive analysis. In Proceedings of the 1st International Scientific Practical Conference "The Individual and Society in the Modern Geopolitical Environment" (ISMGE 2019); 2019/07. Atlantis Press. 2019: 727-730. https://doi.org/10.2991/ismge-19.2019.137.
81. Jewish identity, social capital and giving [https://rshare.library.torontomu.ca/articles/online_resource/Jewish_identity_social_capital_and_giving/14669238]
82. Kusmanto H, Regif S, Ohorella N, Noorikhsan F, Nasution L. The identity of places of worship as a means of spiritualism and political propaganda in Indonesia. . Pharos Journal of Theology. 2023, 104. https://doiorg/1046222/pharosjot104412.
83. Foulidi X, Katsadoros G, Papakitsos E. Customary practices and symbolisms at worship events in a virtual religious community. International Journal of Multicultural and Multireligious Understanding. 2020, 7:45. https://doiorg/1018415/ijmmuv7i71712.
84. Morgan J, Halstead I, Northstone K, Major-Smith D. Religious/spiritual beliefs and behaviours and study participation in a prospective cohort study (ALSPAC) in Southwest England [version 1; peer review: 2 approved with reservations]. Wellcome Open Research. 2022, 7. https://doiorg/1012688/wellcomeopenres179752.
85. Mencken FC, Fitz B. Image of God and Community Volunteering among Religious Adherents in the United States. Review of Religious Research. 2013, 55:491-508. https://doiorg/101007/s13644-013-0115-4.
86. Sidik M. Religious dynamics and traditional beliefs in the ruwat laut ritual amidst the pandemic crisis. Journal of Contemporary Rituals and Traditions. 2023, 1:99–110. https://doiorg/1015575/jcrt380.
87. VanderWeele TJ. Religious communities and human flourishing. Current Directions in Psychological Science. 2017, 26:476–481. https://doiorg/101177/0963721417721526.
88. Choi H, Jeong E, Nguyen VH, Hanh DVB, Dan NP, Shin KH, Han S. Characteristics of sediment affecting monomethylmercury accumulation in benthic fish of the Mekong Delta. Environmental Toxicology and Chemistry. 2019, 38:503-510. https://doiorg/101002/etc4327.
89. Chapman A, Darby S, Tompkins E, Hackney C, Leyland J, Văn P, Nicholas A. Sustainable rice cultivation in the deep flooded zones of the Vietnamese Mekong Delta. Vietnam Journal of Science Technology and Engineering. 2017, 59:34-38. https://doiorg/1031276/vjste59(2)34.
90. Cuong D, Dam D, Duong D, Loi N, Vo N, Kortun A. Extreme value distributions in hydrological analysis in the Mekong Delta: a case study in ca mau and An Giang provinces, Vietnam. Eai Endorsed Transactions on Industrial Networks and Intelligent Systems. 2019, 6:159122. https://doiorg/104108/eai13-6-2019159122.
91. Manh NV, Dung NV, Hung NN, Kummu M, Merz B, Apel H. Future sediment dynamics in the Mekong Delta floodplains: Impacts of hydropower development, climate change and sea level rise. Global and Planetary Change. 2015, 127:22-33.

92. Jeong S, Kim H, Cho K, Yang D, Kim S, Park S. Installation of the brackish water reverse osmosis system coupled with solar power for drinking water production in Ben Tre, Vietnam considering water usage and cost. Academic Society for Appropriate Technology. 2022, 8:75-84. https://doiorg/1037675/jat202200178.
93. Minh Quang N, de Wit J. Transformative learning and grassroots climate adaptation: case studies in Vietnam's Mekong delta. Nature Conservation. 2020, 39:19-43. https://doiorg/103897/natureconservation3929551.
94. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis (8th ed.). United Kingdom: Cengage Learning. 2019.
95. Kline RB: Principles and practice of structural equation modeling (4th ed.). New York, NY: The Guilford Press. 2015.
96. Aslam MM, Haris K, Shahzad A, Raza S, Asher R. Social Capital and Knowledge Sharing as Determinants of Academic Performance. Journal of Behavioral and Applied Management. 2013, 15:25-41. https://doiorg/1021818/001c17935.
97. Judijanto L, Siminto S, Rahman R. The influence of religious beliefs and religious practices on social cohesion in modern society in Indonesia. The Eastasouth Journal of Social Science and Humanities. 2024, 1:139 – 150. https://doiorg/1058812/essshv1i03276.
98. Muniady R, Mamun A, Mohamad M, Permarupan PY, Zainol N. The effect of cognitive and relational social capital on structural social capital and micro-enterprise performance. SAGE Open. 2015, 5:1-9. https://doiorg/101177/2158244015611187.
99. Stroope S: Social networks and religion: The role of congregational social embeddedness in religious belief and practice. Sociology of Religion. 2012, 73:273-298. https://doiorg/101093/socrel/srr052
100. Van Ninh N, Van Tam T. The role of social capital in enhancing community participation for sustainable agricultural tourism. Sustainable Futures. 2026, 11:101612. https://doi.org/101610.101016/j.sftr.102025.101612.
101. Owen A, Videras J. Culture and public goods: The case of religion and the voluntary provision of environmental quality. SSRN Electronic Journal. 2006. https://doiorg/102139/ssrn921912.
102. Wang L, Han J. The relationship study of social capital, knowledge management and performance in logistics enterprises based on SEM. In 2014 IEEE Workshop on Advanced Research and Technology in Industry Applications (WARTIA); 29-30 Sept. 2014. 2014: 1249-1251.
103. Liu Z, Jia H. Cultural Capital and Volunteering. A Multilevel Study From China. Nonprofit and Voluntary Sector Quarterly. 2021, 51:1377-1398.
104. Jors K, Büssing A, Hvidt NC, Baumann K. Personal prayer in patients dealing with chronic illness: A review of the research literature. Evidence-Based Complementary and Alternative Medicine. 2015, 2015:927973. https://doiorg/101155/2015/927973.
105. Purwaningsih I, Aziz A, Istiqomah I, Rosyadi I. Spiritual and religious characteristics in cancer patients. KnE Life Sciences. 2022, 7:412–420. https://doiorg/1018502/klsv7i210335
106. Abo-Zena M, Hassan A. Reflecting personal, family, and community ethnographies to understand how fasting Ramadan fuels the religious development of Muslim youth. Journal of Islamic Faith and Practice. 2024, 5:53–83. https://doiorg/1018060/28094.
107. Aminnuddin N. Religiousness differences and associations of beliefs and practices: Muslims in religious and non-religious work environments. Psychological Thought 2002, 15:168–186. https://doiorg/1037708/psyctv15i2635.
108. Levy G, Razin R. Religious beliefs, religious participation, and cooperation. American Economic Journal: Microeconomics. 2012, 4:121-151. https://doiorg/101257/mic43121.
109. Akbari B. Examine the relationship between religiosity and social capital. International Journal of Academic Research in Business and Social Sciences 2013, 3:328-336. https://doiorg/106007/ijarbss/v3-i12/436.

Figures

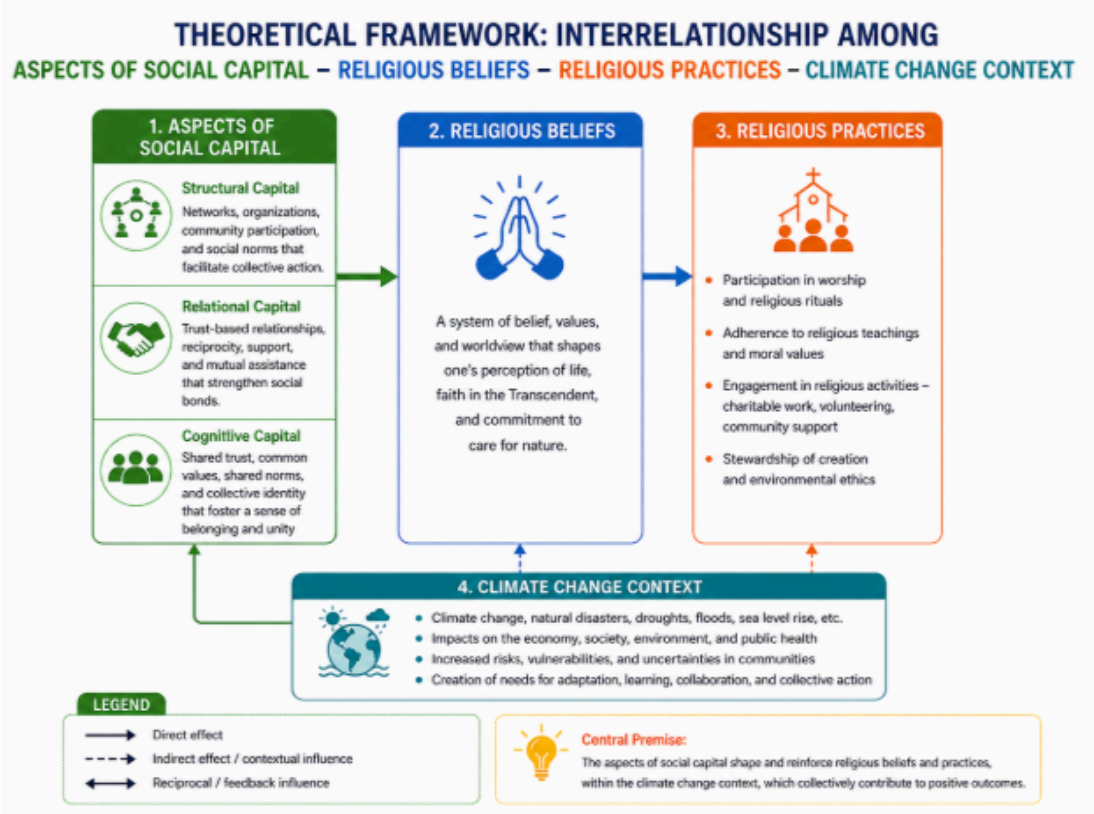


Figure 1

A conceptual diagram illustrating the relationships among social capital dimensions, religious belief, religious practice, climate change context in the Mekong Delta, Vietnam.

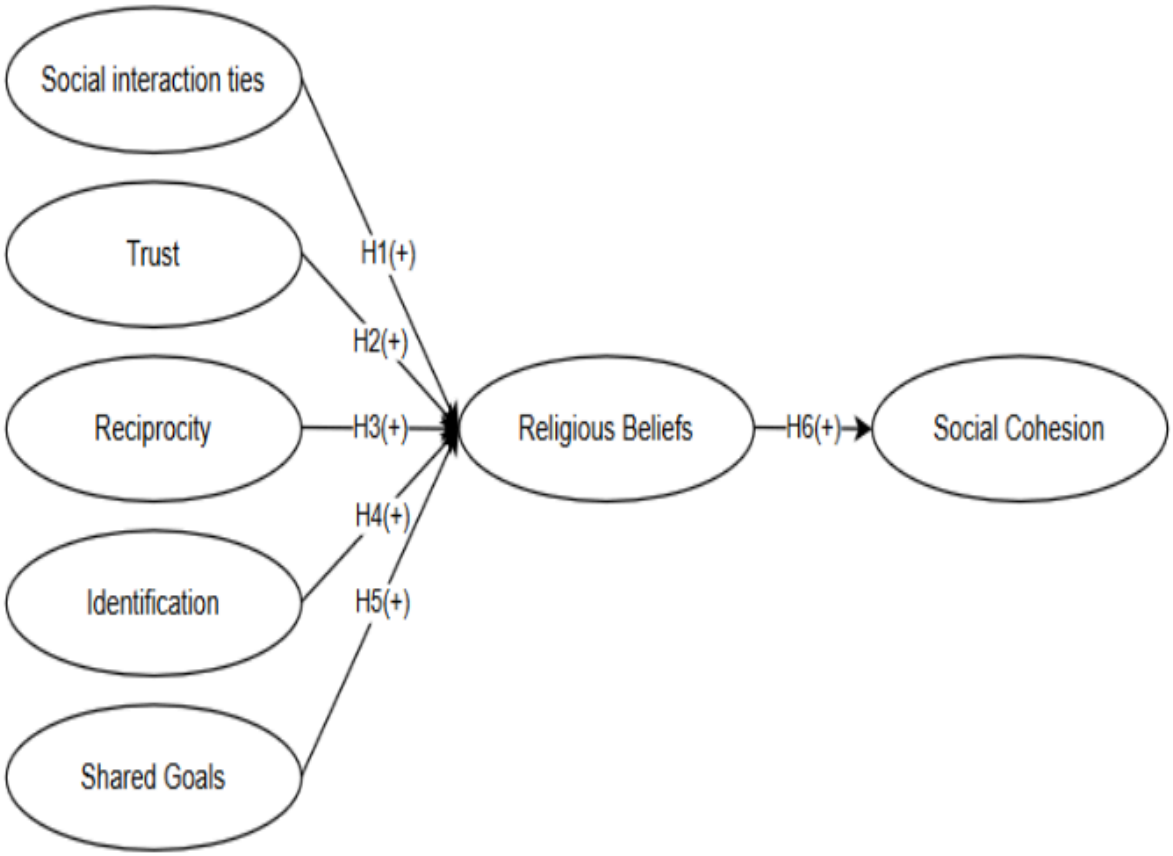


Figure 2

Proposed research model.

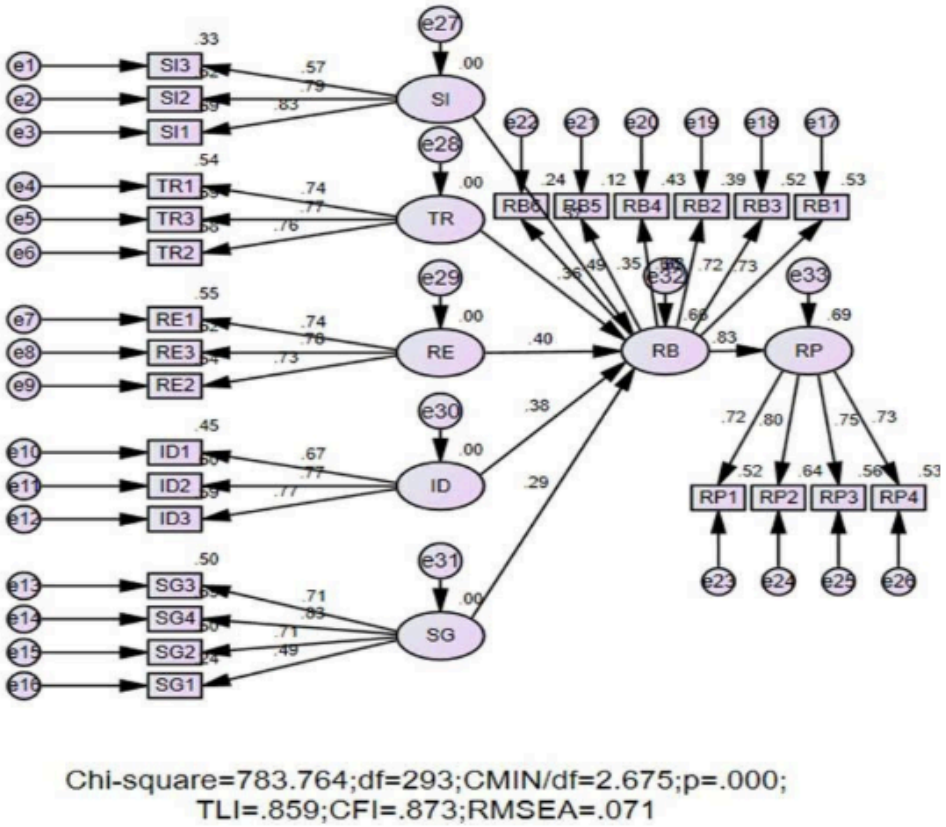


Figure 3

SEM results of the research model.

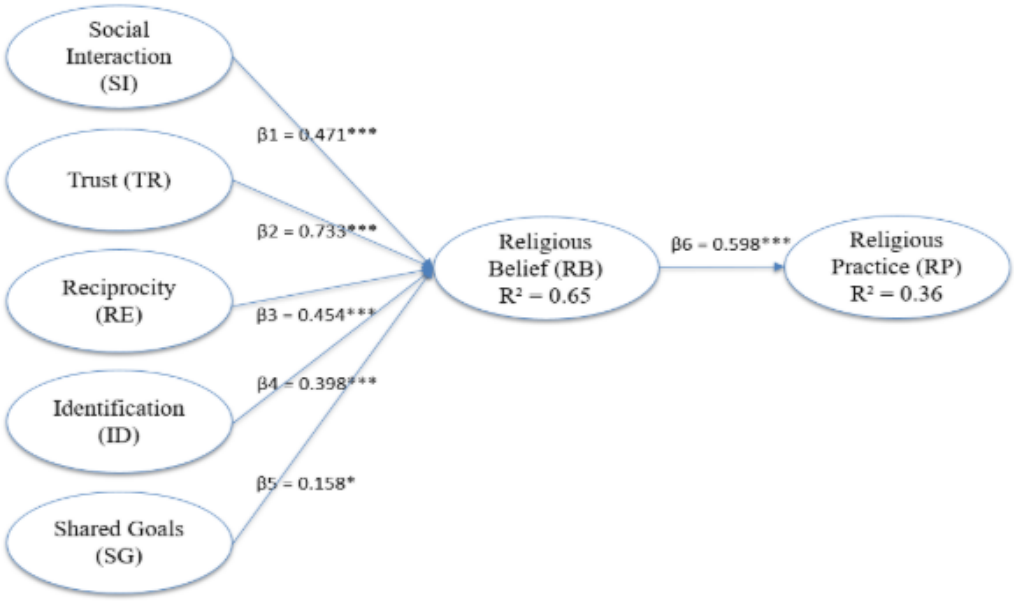


Figure 4

SEM results of the research model.