



What motivates local leaders of community forests in Nepal? An examination of leaders' expressed values and experiences

Prabin Bhusal^{a,b,*}, Rajan Parajuli^a, Erin Sills^a, Conghe Song^c, Gregory E. Frey^d

^a Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, NC 27695, USA

^b Institute of Forestry, Tribhuvan University, Pokhara Campus, Hariyokharka-15, Nepal

^c Department of Geography and Environment, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599, USA

^d United States Department of Agriculture Forest Service, Southern Research Station, Research Triangle Park, NC 27709, USA

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ABSTRACT

Nepal's community forestry (CF) program, a globally recognized model of participatory forest management, relies on voluntary local leaders to guide forest management and governance decisions. Sustaining voluntary leadership has become increasingly challenging because of outmigration, declining forest dependence, and growing urban influence on rural livelihoods. In this study, we explore the values and motivations of existing leaders of community forest user groups (CFUGs), which underpin the leadership characteristics in sustaining these local institutions. We surveyed 144 leaders of 49 CFUGs in Nepal's mid-hills and used their responses as indicators of leadership values, derived from the "Motivation to Lead" and related theoretical frameworks. Using exploratory factor analysis and a multiple indicators multiple causes (MIMIC) model, we identify three motivation factors and examine their associations with leaders' individual and CF characteristics. The results suggest that, out of the 16 indicators, eight explain core values and motives clustered into three latent motivation factors, indicating three axes of leadership motivation in Nepal's CF program: environmental stewardship, altruism, and power and influence. Leaders were likely to be motivated by either environmental stewardship or altruism. However, leaders motivated by either altruism or environmental stewardship were also motivated by the power and influence. Furthermore, individual leadership characteristics such as leadership position and duration, and CF characteristics such as forest type, support from non-governmental organizations, fire incidences, and leadership experience in local governments, are associated with leadership motivation factors. These findings inform understanding of voluntary leadership drivers in CFUGs, for strengthening and sustaining community-based forest management in Nepal.

1. Introduction

The leadership of local people is integral to effective forest governance, as it facilitates decision-making, promotes good governance, and fosters the development of future leaders (Sinha and Suar, 2005; Kimengsi et al., 2019; Dhungana et al., 2024). Individual-level characteristics such as values and motives are widely recognized in social-psychological literature as shaping human behavior and decision-making processes across various areas, including leadership patterns (Caprara et al., 2006; Oreg and Katz-Gerro, 2006; Schwartz et al., 2012). In contemporary studies, values and motives have been shown to influence engagement in resource management and collective

decision-making processes (Schwartz et al., 2012; Wright et al., 2023). For instance, individuals may engage in conservation efforts because they inherently value resources for long-term sustainability (Agrawal and Chhatre, 2006; Schwartz et al., 2012). Furthermore, patterns of reciprocity, trust, and reputation, shaped by local norms and reinforced through repeated interactions, influence leadership dynamics and collective action, thereby shaping governance outcomes in natural resource management (Ostrom, 2010; Wright et al., 2023).

Community forestry (CF) in Nepal is a participatory forest management system that involves local communities in forest management and decision-making, institutionalized through community forest user groups (CFUGs) (Kimengsi and Bhusal, 2021; Ojha and Hall, 2021).

* Corresponding author at: Department of Forestry and Environmental Resources, North Carolina State University, Raleigh, NC 27695, USA.

E-mail addresses: pbusal@iofpc.edu, pbusal@ncsu.edu (P. Bhusal), rparaju@ncsu.edu (R. Parajuli), sills@ncsu.edu (E. Sills), csong@email.unc.edu (C. Song), gregory.e.frey@usda.gov (G.E. Frey).

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CFUGs are legally formed institutions with rights to manage and make decisions regarding national forests under their jurisdiction (see [Kimengsi and Bhusal, 2021](#)). These groups led by local people who volunteer and are elected to serve as executive committee members. These leaders are responsible for day-to-day decision-making related to CFUG governance and the implementation of forest management plans. Their role also includes fostering members' equitable participation in the governance process and benefit-sharing. Apart from resource management, they also play a fundamental role in establishing ownership, trust, and cooperation among users, which are necessary for long-term collective actions and mutual benefits ([Kimengsi et al., 2019](#)). Such leadership not only institutionalize participation in forest governance but can also strengthen collective action by inspiring community members, enforcing institutional norms, resolving conflicts, building networks with development partners, and ensuring the delivery of expected outcomes ([Sinha and Suar, 2005](#)). Importantly, these local leaders' practices now operate within a broader political context: the federal restructuring of 2015, which established robust local governments with expanded legislative authority over natural resources, including community forests ([Ojha and Hall, 2021](#)).

Sustaining this leadership is becoming increasingly challenging due to rising rural outmigration, declining forest dependency, and growing urban influence on CFs ([Bista et al., 2023](#); [Laudari et al., 2024](#)). In many CFUGs, low interest in leadership roles has led to the same individuals remaining in leadership positions for extended durations. This trend is particularly evident in smaller and less active CFUGs in the mid-hills, where participation in leadership is steadily declining ([Poudyal et al., 2023](#)). Similarly, women and marginalized groups remain underrepresented ([Baral et al., 2024](#)). These challenges raise critical questions about what motivates people to step into and remain in leadership roles. Declining interest in CF, compounded by outmigration, threatens leadership sustainability and active participation in CFUG governance ([Laudari et al., 2024](#)). Given that CFUGs have been instrumental in reviving degraded forests and contributing to the livelihoods of millions of people over the last five decades ([Ojha and Hall, 2021](#)), it is crucial to understand the values and changing contexts that drive local leaders' motivation and their continued engagement in this voluntary position.

Understanding the motivations of leaders offers valuable insights into the fundamental drivers of leadership engagement. This understanding can inform the development of policies and strategies aimed at enhancing effective leadership within the evolving socioeconomic and governance contexts of Nepal. Furthermore, it can address persistent challenges such as elite capture and lack of accountability, which are widespread in Nepal's CF program ([Bhandari et al., 2018](#); [Gautam et al., 2023](#)). Given that leadership is a multifaceted social phenomenon embedded within various societal dimensions ([Block, 2014](#)), it is crucial to explore and identify the intrinsic, extrinsic, and societal values that motivate CFUG members to serve in voluntary leadership positions. Additionally, examining how leaders' socioeconomic and demographic backgrounds as well as the biophysical condition of CFUGs can help explain how individual and environmental conditions shape leadership motivations. This understanding is essential for enhancing the governance structure of CFUGs, developing strategies to motivate new leaders, and ultimately ensuring the program's long-term success and sustainability.

Several social psychology studies have analyzed how values shape human behavior ([Amit et al., 2007](#); [Schwartz et al., 2012](#); [Bohl, 2019](#)) and developed a theoretical understanding of the importance of values and motives in leadership and collective action ([Ostrom, 2000](#); [Jagers et al., 2020](#)). Similarly, studies have examined the significance of power in structuring institutions and shaping governance outcomes ([Clement et al., 2019](#)). However, the specific influence of individual values on natural resource governance arrangements remains underexplored ([Agrawal et al., 2023](#)). While leadership has received greater scholarly attention outside the field of natural resource governance ([Andersson et al., 2020](#)), leadership motivation, particularly in the context of

commons management, remains largely overlooked ([Agrawal et al., 2023](#)). Similarly, very few studies have examined leadership style ([Rishi and Gauli, 2005](#)) or the inclusion of marginalized groups in executive committee ([Yadav et al., 2014](#)) in Nepal's CF. There is a notable empirical gap in understanding the underlying motivational factors that drive voluntary leadership and how these motivations intersect with sociodemographic and biophysical attributes.

In this context, our study aimed to explore and identify the key values and motives driving voluntary leadership in CFUGs by uncovering latent motivational factors. Additionally, using the survey data from CFUG leaders in two different geographic locations in Nepal's mid-hill region, we examined how leaders' characteristics (e.g., gender and position) and forest conditions (e.g., size, type, fire incidence, regeneration status, NGO support, and leaders' experience in local government) are associated with these motivations. These findings inform strategies for developing new leaders, advance our understanding of what sustains leadership in CFUGs, and support forest governance in the future.

2. Theoretical framework

2.1. Developing indicators of values and motives

The theoretical foundation of this study primarily builds on [Chan's \(1999\)](#) and [Chan and Drasgow's \(2001\)](#) framework of individual difference and leadership, which conceptualizes the Motivation to Lead (MTL). [Schwartz et al.'s \(2012\)](#) theory of basic individual values is also consistent with MTL and provides a structural lens through which to understand how values shape motivations. These frameworks offer a strong basis for analyzing the values and motives that drive voluntary leadership within community forest governance.

According to MTL, leadership is an emergent social phenomenon involving interpersonal dynamics within groups and institutions. MTL integrates three aspects of individuals' engagement in leadership roles, based on the latent factors that are measured through observable values ([Chan and Drasgow, 2001](#)). First, affective identity motivation is the inner desire, intrinsic value, and enjoyment of leadership. Second, social normative motivation is related to both societal and normative reasons. Third, non-calculative motivation focuses on community sacrifice, describing personal sacrifices of the leader for the good of the community rather than the costs or benefits of leadership. As theorized by [Chan and Drasgow \(2001\)](#), 16 indicators of values and motives capture these three motivation dimensions ([Fig. 1](#)). For instance, indicators, such as self-direction, hedonism, humility, and the warm glow of giving, reflect intrinsic value-related motivation that shapes a leader's affective identity. Indicators, such as local institutions, social norms, and achievements, define social normative motivations, whereas benevolence, conformity, and reciprocity point to the values and motives of leadership linked to sacrifice for the sake of the community.

Similarly, [Schwartz et al. \(2012\)](#) used the values theory, especially the theory of basic human values, to explain individual decision-making, attitudes, and behavior. Schwartz's universal value types, such as self-direction, stimulation, security, universalism, and benevolence, are directly reflected in this study's indicators of leadership motivation. [Schwartz et al. \(2012\)](#) theorize that values form an integrated system that guides individual decision-making, attitudes, and behavior, including why and how individuals engage in leadership roles.

Our model is further supported by self-determination theory ([Ryan and Deci, 2000](#)), social exchange theory ([Bierstedt and Blau, 1965](#)), and collective action theories by [Ostrom \(2000\)](#) and [Jagers et al. \(2020\)](#), which enrich the understanding of motivation and participation in leadership in the resource governance context. Self-determination theory adds to identifying intrinsic and extrinsic forms of motivation. Intrinsic motivation-driven interests and personal values lead to greater satisfaction and engagement. Three key psychological needs enhance intrinsic motivational behavior: competence, autonomy, and relatedness. In this study's context, indicators such as self-direction,

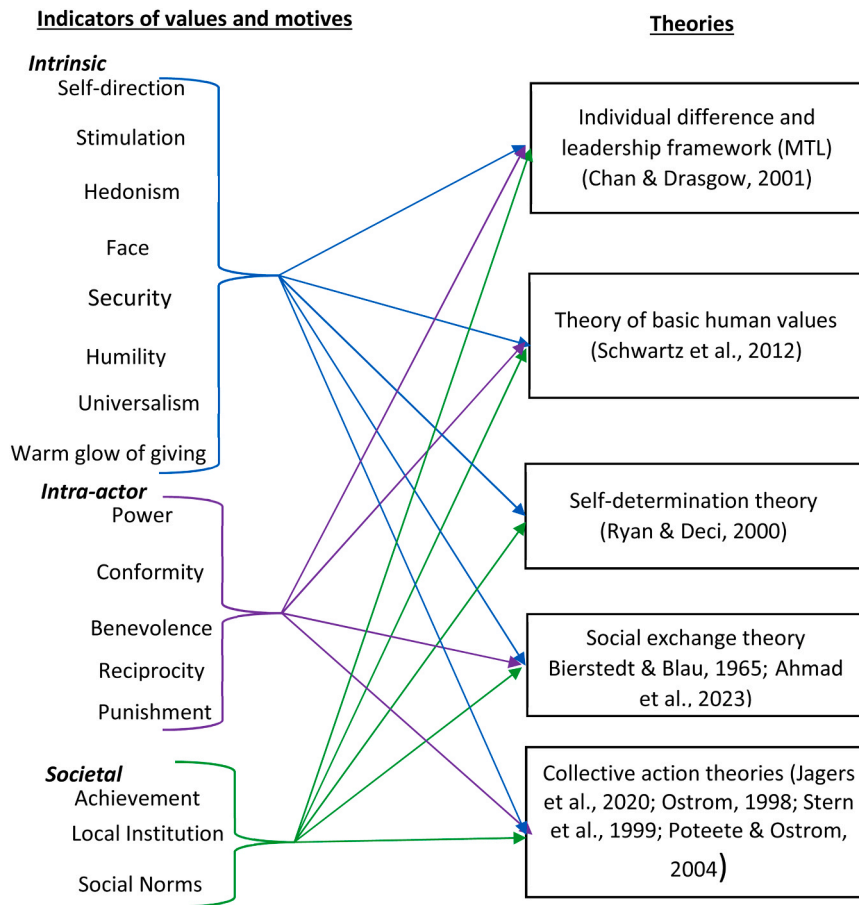


Fig. 1. Indicators of values and motives grouped into three conceptual domains, with theoretical linkages. Colored arrows denote the theoretical framework that explains the relevance of each indicator.

stimulation, and hedonism, characterize autonomous behavior, whereas achievement, power, and humility define competence and benevolence, and universalism and social norms describe relatedness. External regulations, introjections, and identified rules drive extrinsic motivations. For instance, face, conformity, and punishment are examples of external regulations; the warm glow of giving and security describes introjections; and local institutions and reciprocity are examples of identified regulations.

The social exchange theory posits that people in social institutions, including voluntary leadership roles, when perceived benefits such as social recognition and security, psychological fulfillment, and long-term resource security outweigh costs (e.g., time, effort, and stress). In the context of CFUGs, leaders accept personal sacrifices because they anticipate rewards, such as social respect, personal fulfillment, and a healthy forest that reinforces their motivation. Similarly, Ostrom (2000) and Jagers et al. (2020) suggest that values and motives that describe the intrinsic, inter-actor, and societal dimensions are critical in facilitating the generation and sustenance of collective action. For instance, indicators such as reciprocity, power, punishment, social norms, and local institutions are among the most important for sustaining collective forest governance (Ostrom, 1998; Stern et al., 1999; Poteete and Ostrom, 2004; Ostrom and Walker, 2003). Together, these theories offer a multidimensional explanation of voluntary leadership motivation, linking individual values, social obligations, and institutional factors such as forest size and leaders' experience in local government that enhance collective governance outcomes in Nepal's community forestry (Fig. 2).

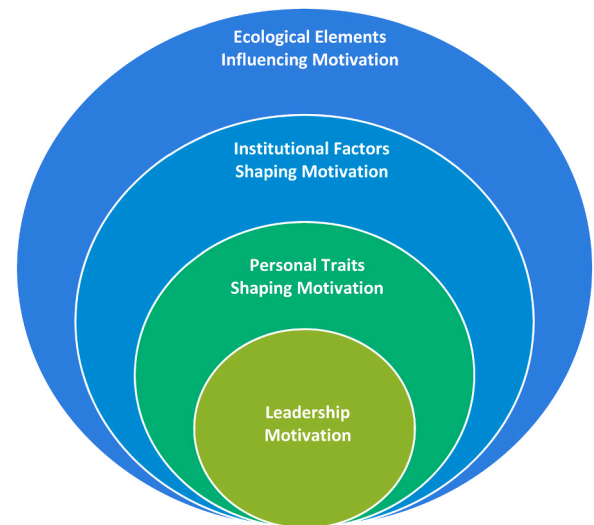


Fig. 2. A nested framework illustrating the multi-level influences on voluntary leadership motivation in CFUGs. Adapted from socio-ecological models of individual behavior (Bronfenbrenner, 1979; Sallis et al., 2005).

2.2. Theoretical basis for selection of explanatory covariates

Leadership is characterized by personality, vision, and ability to motivate and inspire others toward a shared goal (Hurn and Tomalin, 2013; Jaqua and Jaqua, 2021). It is a socially constructed contextual

process that manifests through dynamic interactions between individual characteristics and environmental factors in fostering collective goals (Amit et al., 2007; Bohl, 2019) (Fig. 2).

We hypothesized that socio-demographic, institutional, and bio-physical factors such as gender, leadership position, leadership experience, forest type, forest size, NGO support, fire incidence, and leadership experience in local government significantly influence the latent motivational constructs underlying leadership engagement in CFUGs. Leadership characteristics such as leadership experience evolves over time, influencing one's inner desire and motivation to lead (Chan and Drasgow, 2001). Gender plays a critical role in leadership dynamics, with systemic barriers often limiting women's participation (Agrawal, 2001; Nightingale, 2002; Baral et al., 2024). Similarly, leadership positions in CFUGs particularly chairpersons exert a greater influence on decision-making processes (McDougall et al., 2013; Ojha et al., 2009).

In addition, the institutional and ecological characteristics of CFUGs, such as forest type, forest size, and external support from NGOs shape the incentives and constraints that leaders navigate (Ostrom, 2009; Gupta et al., 2020). For example, larger forest areas and NGO facilitation are associated with resource benefits and incentives enhancing leadership engagement in institutional capacity-building (Ostrom, 2009). Conversely, frequent forest fires may demotivate leadership by imposing stress and demanding intensive community mobilization (Budiningsih et al., 2020). On the other hand, CFUG in Nepal have been an important institutional platform for building social and political capacity of executive committee members (Ojha and Hall, 2021), fostering strong community networks that have enabled many members to participate in and be elected to local governments (see Table S1).

Our theoretical argument on leadership motivation is informed by the socio-ecological model of individual behavior developed by Bronfenbrenner (1979), presented in Fig. 2, which describes the multiple forces that underpin individuals' behavior, specifically leadership motivation in our context. Our adopted model depicts how leadership motivation is shaped by interacting layers of personal traits (e.g., values

and motives), institutional factors (e.g., forest size, income, NGOs support and experience in local government), and broader ecological elements (e.g., forest type and fire frequency). This nested structure reflects a multidimensional understanding of leadership motivation, emphasizing the interplay between individual, institutional, and environmental contexts in shaping voluntary engagement in community forestry leadership.

3. Methods

3.1. Study area

We selected two mid-hills districts of Nepal, Kaski in Gandaki Province and Kavrepalanchok in Bagmati Province, as the study sites (Fig. 3). In Kaski district, approximately 31 % of the total forest area is under the CF program, which is managed by 506 CFUGs (DFO, 2022). Similarly, in Kavrepalanchok, 42 % of the CF program managed by 449 CFUGs (DFO, 2025) (Table 1). Within the districts, we focused on CFUGs under the Lekhnath subdivision forest office (Kaski) and Janagal subdivision forest office (Kavrepalanchok). The survey of CFUG leaders was part of a large study focused on watersheds in Nepal, including the Bagmati province. CFUGs in these two subdivisions had on average been formed 40 years ago, providing insight into leadership over decades, and epitomizing concerns about the continuity of CFUG leadership in the context of growing urban influence and outmigration (Bista et al., 2023; Laudari et al., 2024).

3.2. Survey and data collection

We conducted structured questionnaire-based interviews with CFUG leaders in the two study sites. A two-stage sampling framework guided the selection of both the CFUGs and leaders. In the first stage, we purposively selected one sub-divisional forest office from each of two districts: Lekhnath in Kaski and Janagal in Kavrepalanchok, based on their

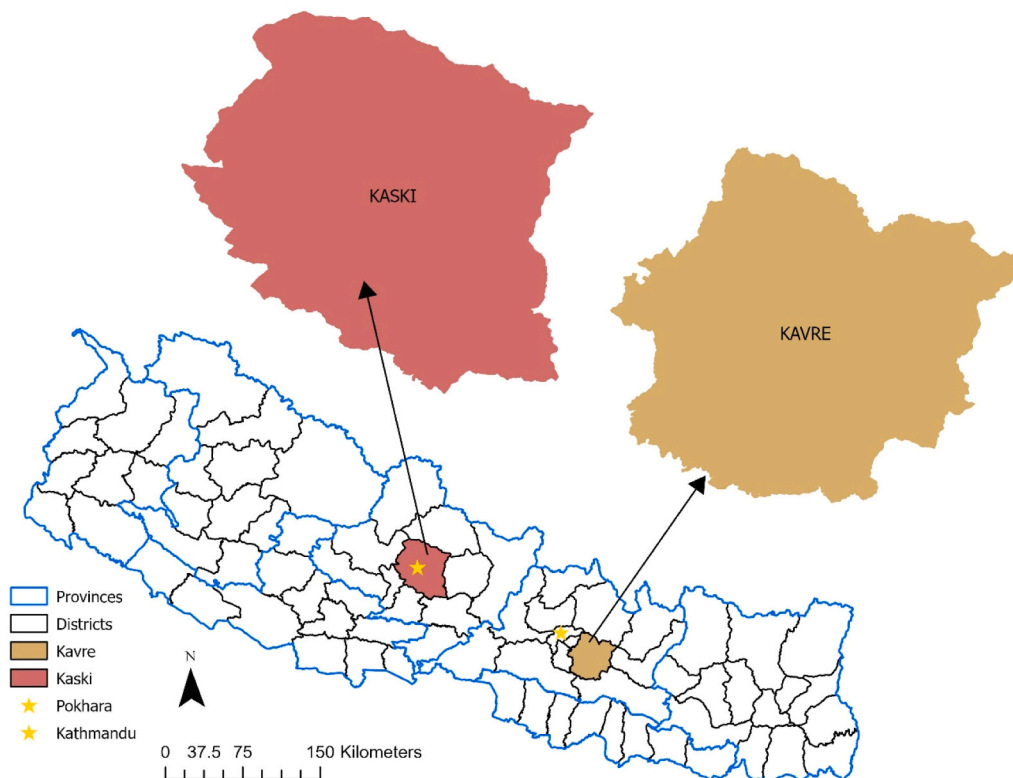


Fig. 3. Map of study sites in the mid-hills of Nepal.

Table 1
Overview of study sites.

Study Sites	District	Total area of district (ha)	Total forest area (ha)	Forest area under CFUG (ha)	Total number of CFUGs in district	Total number of CFUGs in sub-division	Total CFUGs surveyed
Lekhnath subdivision forest office	Kaski	201,700	70,510	21,695	506	135	26
Janagal subdivision forest office	Kavrepalanchok	522,014	73,075	31,045	449	94	23

large number of CFUGs, long history of CF implementation since its inception in the 1990s (see [Kimengsi and Bhusal, 2021](#)), and their representativeness of the mid-hills region forest ecology and growing urban influence and outmigration. Discussions with forest officers in both districts helped refine the site selection.

In the second stage, using the roster of CFUGs within each selected sub-divisional forest office as the sampling frame, we randomly selected 60 CFUGs (30 per district) with the expectation of reaching 25 CFUGs in each district and allowing flexibility to skip a few CFUGs in case of issues related to accessibility, availability, and non-response. For each CFUG, we interviewed at least three executive committee members, prioritizing chairpersons, vice-chairpersons, secretaries and treasurers. In total, we individually interviewed 144 CFUG leaders: 76 leaders from 26 CFUGs in Kaski and 68 leaders from 23 CFUGs in Kavrepalanchok district. Compared to other recent studies ([Kuuwill and Kimengsi, 2024](#); [Paudel et al., 2025](#)), our sample, spanning 49 CFUGs, provides robust variability in both ecological and institutional contexts from two provinces in Nepal. This broad site-level heterogeneity enhances the analytical rigor of our dataset compared to larger samples sizes drawn from fewer CFUGs ([Link et al., 1994](#)).

First, we conducted a value and motive survey using 16 indicators with the CFUG leaders. The questionnaire was designed to measure leaders' values and motives based on the theoretical framework ([Fig. 1](#)). The statements in each indicator were designed to contextually reflect values and motives appropriate for CFUGs in Nepal. Each statement was phrased in the first person to encourage personal reflection and align with how individuals naturally assess their motivation. For instance, statements, such as "being a CFUG member makes me feel safer in my community" (security) or "CF supports and promotes equality and equity irrespective of one's economic and social status" (universalism), were tailored to express the essence of each value and motive in terms of everyday CF governance (see [Table 2B](#)). Each item was rated by the respondent on a 3-point Likert scale (1 – Do not resonate at all, 2 – A little bit resonate and 3 – Completely resonate).

This was followed by an institutional survey to collect data on the institutional and ecological attributes of CFUGs ([Table 2A](#)). The survey was conducted by the author and another PhD student in June and July 2023. North Carolina State University Institutional Review Board (IRB) reviewed and approved the survey instrument and administration procedures as exempt research. Prior to each interview, we informed respondents about the study's purpose, obtained their consent to participate, and assured them of the anonymity and confidentiality of their responses and participation. Their participation was voluntary without compensation.

3.3. Data analysis

We began the analysis by exploring the descriptive statistics of indicator variables used to measure the values and motives driving CFUGs leadership, as well as the explanatory covariates that describe the leadership and CFUGs characteristics (see [Table 2](#)). This analysis helped understand the sample characteristics and variable distribution before estimating the empirical models. Next, we conducted an exploratory factor analysis (EFA) using the indicators developed to measure the values and motives described in the literature to identify leadership motivation factors. Finally, we examined how these motivation factors

are associated with the experiences of leaders, including their individual characteristics and CFs' characteristics, using multiple indicator–multiple causes (MIMIC) model estimation.

3.3.1. Exploratory factor analysis

We performed an EFA to understand the underlying structure of CFUG's leadership motivations using 16 indicators of leadership values and motives to lead CFUG leadership in Nepal. The EFA was selected because it is suitable for situations in which the theoretical structure is not clearly defined, allowing for identification of the underlying pattern in the data by grouping correlated variables into factors ([Gaskin and Happell, 2013](#)). Similarly, this approach reduces dimensionality by capturing the shared variance among observed variables, resulting in a smaller set of latent indices ([Bandalos and Boehm-Kaufman, 2009](#)). These latent factors represent underlying motivations that are not directly observable but are inferred from participants' responses to survey questions eliciting their leadership aspirations and styles. As a result, the EFA provided empirical evidence to support model development and validate the factor structure of leadership motivations within the CFUGs. The EFA model is represented as follows ([Rose and Spiegel, 2010](#)):

$$Y = \Lambda\eta + \varepsilon \quad (1)$$

Where Y is a vector of observed indicator variables measuring CFUGs values and motives, Λ is a matrix of factor loadings, η is a vector of latent factors representing the underlying dimensions of CFUGs leaders' values and motives, and ε is a vector of measurement errors for the indicators.

As we measured the response of indicator variables on an ordinal scale, we computed the polychoric correlations of indicators before running the EFA. This matrix accounts for the categorical nature of the data and is preferred over the Pearson correlation analysis ([Lee et al., 2012](#); [Watkins, 2018](#)). Similarly, we assessed multicollinearity for all indicators to ensure the data suitability for factor analysis ([Figure S1](#)). A parallel analysis scree plot was used to determine the appropriate number of factors by comparing the actual eigenvalues with simulated random data ([Fig. 4](#)). Weighted least squares was chosen as the extraction method because it performs well with the ordinal data ([Lee et al., 2012](#)), and the promax rotation was used to allow for correlations among factors ([Finch, 2011](#)).

After the initial EFA with all 16 indicators, specifying three factors based on eigenvalues >1 , we refined the EFA model by removing indicators with low loadings (<0.45) or cross loadings. This process was repeated iteratively, reducing indicators from 16 to 11 and then to a final set of eight indicators based on factor loadings, no substantial cross-loadings, and model fit statistics, resulting in a parsimonious factor model ([Table 3](#)). Thus, EFA estimated the final three motivation factor model from 16 indicators of values and motives.

3.3.2. The multiple indicator–multiple causes (MIMIC) model estimation

In this study, we examined the effect of explanatory covariates, including CFUG leaders' and CFUGs' characteristics (e.g., leadership gender, leadership position, leadership duration, forest type, and CFUGs income status) on latent factors related to leadership values and motives to take on CFUGs executive committee roles ([Table 2](#)). After finalizing the EFA model that developed and defined the latent motivation factors, we used the MIMIC model to estimate the effects of covariates on the 3-

Table 2
Description and summary statistics of covariates (A) and indicators of value and motives (B).

Variables	Description	Mean (min-max)
A. Covariates: Leader Characteristics		
Gender	Binary- 1 if male; 0, female	0.71
EC position	Binary- 1 if chair as a leadership position in executive committee; 0, otherwise	0.29
Leadership experience (duration)	Continuous- duration of years in leadership position	9.37 (0.5–33 year)
CFUG characteristics (Situational variables)		
Forest size	Continuous- total area of community forest in hectare	36.13 (0.53–200 ha)
Forest type	Binary- 1 if coniferous as dominant forest type covering more than 50 % area; 0, otherwise	0.12
NGOs support	Binary- 1 if CFUG collaborated with any external partners to carry out projects in the last ten years; 0, no collaboration	0.4
Fire incident	Binary- 1 if compared to 10 years ago there is more incidence of wildfire in community forests in the last 12 month; 0, otherwise	0.09
Income status	Binary- 1 if compared to 10 years ago, CFUG's income is higher in the last 12 month; 0, otherwise	0.31
Experience in LG	Binary- 1 if CFUGs having leaders serves or have previously served in local government (LG); 0, otherwise	0.51
B. Indicators of values and motives: measured on an Ordinal- 3 point Likert scale (1 = Not at all, 3 = Completely resonates). The statement in parentheses was asked to respondents as part of the survey questionnaire.		
Self-values and motives (see Schwartz et al., 2012)		
Self-direction	Freedom to develop one's own ideas and abilities (<i>I can come up with innovative ideas to help my CFUG with its management and activities</i>).	2.83
Stimulation	Excitement, novelty, and change (<i>I can bring positive changes in my community by being a member of a CFUG.</i>)	2.86
Hedonism	Pleasure and self-gratification (<i>Being involved with my CFUG brings me joy and satisfaction</i>).	2.69
Face	Security and power through maintaining one's public image and avoiding humiliation (<i>People won't like me if I am not a member of a CFUG</i>).	1.67
Security	Safety in one's immediate environment (<i>Being a CFUG member makes me feel safer in my community</i>).	2.84
Humility	Recognizing one's insignificance in the larger scheme of things (<i>Protecting forests through CF helps in the overall fight against climate change. Protecting forests through CF will be good for the future generation</i>).	2.95
Universalism	Commitment to equality, justice, and protection for all people (<i>CF supports and promotes equality and equity irrespective of one's economic (e.g.: rich people are not favored) or social status (e.g.: Dalit's are not discriminated against)</i>).	2.87
Warm glow	Doing something to boost one's image in one's own eyes or in the eyes of the other people (<i>I participate in CF-related activities because it makes me feel good about myself; plus, others think I am good person for doing it!</i>)	2.65
Intra-actor values and motives		
Power	Effecting control over people (<i>Being a member of a CFUG helps me to influence others</i>).	2.78
Conformity	Avoidance of upsetting or harming other people (<i>I am a member of my CFUG because my neighbors would be upset if I weren't</i>).	1.68

Table 2 (continued)

Variables	Description	Mean (min-max)
Benevolence	Devotion to the welfare of group members (<i>I am a member of my CFUG because I want the poor and the marginalized, along with the rest in my CFUG, to lead better lives</i>).	2.24
Reciprocity	Other actors previous action affects the propensity to cooperate (<i>I participated in CFUG-related activities (such as COVID-relief, forest thinning, weeding, etc.) because others did</i>).	1.49
Punishment	Sanctioning of non-cooperative behavior (<i>If I don't attend CFUG-related meetings or the General Assemblies regularly, my CFUG membership might be revoked or canceled</i>).	2.1
Societal values and motives		
Achievement	Success according to social standards (<i>I want to be a member of a CFUG so that I can contribute to my community's sustainable development</i>).	2.92
Local institutions	Sound institutional design supporting observability, monitoring and sanctioning (<i>Engagement with my CFUG, its management and its activities is made possible because of the existing support from the local government, FECOFUN, and other related institutions</i>).	1.67
Social norms	Societal (descriptive and prescriptive) norms (<i>Forests are integral to our culture, and physical and spiritual well-being</i>).	2.58

factor structure describing a typology of CFUG leadership (see Proitsi et al., 2011; Chen and Jiang, 2019). The MIMIC model is designed for settings where latent variables were measured through observable indicators and influenced by observable causes (Jöreskog and Goldberger, 1975; Chen and Jiang, 2019; Holley et al., 2020). The MIMIC approach has been used extensively in disciplines such as physiology and neurology (Lim, 2014; Proitsi et al., 2011), and it has gained traction in behavioral studies, where behavioral constructs (e.g., motivations, attitudes) are inherently latent (Chen and Jiang, 2019). One of the key advantages of MIMIC is its ability to incorporate covariates directly into the structural model, improve model specifications, and enhance the explanatory power (Woods et al., 2009). Further, the MIMIC model performs well even with small sample sizes (Diemer, 2023), making it appropriate for our case. The MIMIC model can be represented as:

$$\eta_i = z_i\Gamma + \zeta_i \quad (2)$$

Where η_i denotes a latent factor, Γ is a vector of coefficients, z is a vector of observed covariates, and ζ_i is the error term of the latent variable.

The latent factor (η_i) represents the CFUG leaders' values and motives, which were estimated using EFA. In Eq. 1, a matrix of factor loadings (Λ) is derived from the EFA, which identifies the underlying factor structure among the observed indicators (Y). Once the factor model was estimated, the factor scores (η_i) for each observation were computed using regression-based scoring. These latent factor scores were then used as dependent variables in the structural model (Eq. 2), where η_i is modeled as a function of observed covariates (z_i) through the coefficient vector Γ , with ζ_i representing the disturbance term. This approach links the measurement model (Eq. 1) to the structural model (Eq. 2), allowing us to assess how individual and CFUG-level characteristics relate to CFUG leaders' latent values and motives. We assessed the model's fit using multiple criteria, including the chi-square (χ^2) test, Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). We estimated the odds ratio and percentage changes in log odds to interpret the effects of covariates on each latent factor (Lambert et al., 2015; Adhikari et al., 2024). The log odds elucidate how leaders' motivation changes when a covariate changes by one

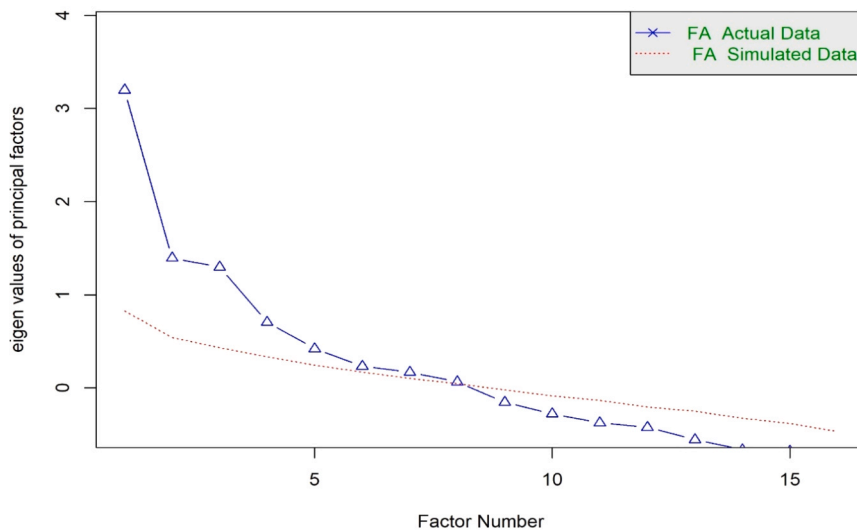


Fig. 4. Parallel analysis scree plot comparing empirical and simulated eigenvalues. Dashed line shows simulated random eigenvalues. Factors were retained where empirical eigenvalues (solid line) were greater than 1.

Table 3
Comparative analysis of exploratory factor analysis models showing key fit statistics and measurement characteristics across five iterations.

Metric	Model 1	Model 2	Model 3	Model 4	Model 5
Number of indicators	16	11	10	8	8
Factors retained	3	3	3	2	3
Cumulative variance	46 %	55 %	61 %	59 %	70 %
RMSR	0.11	0.09	0.08	0.09	0.07
Off-Diagonal fit	0.82	0.91	0.94	0.94	0.97
Number of cross-loading indicators (≥ 0.40 loadings on two or more factors)	2	0	2	0	0
Number of low loading indicators (< 0.45)	3	1	0	0	0
Factor correlations	0.16–0.33	0.02–0.28	0.18–0.27	0.27–0.27	0.09–0.55
Communality range	0.13–0.85	0.24–0.83	0.40–0.93	0.41–0.92	0.50–0.95

unit, while holding all other covariates constant. Finally, we analyzed the standardized regression coefficient that shows the strength of each covariate associated with the latent motivation factors and their covariance (Fig. 5). Analyses were conducted using R version 4.4.1 (2024) with the lavaan package (Rosseel, 2012).

4. Results

4.1. Descriptive statistics

Table 2 illustrates summary statistics of the respondents characterized by nine covariates and their responses on 16 values and motive indicators. The sample reflects notable patterns in leadership roles and community forest characteristics. A majority of respondents were males. Leadership tenure was generally long, suggesting strong continuity, though the wide range also indicates variation in leadership experience.

Forest areas managed by CFUGs were typically moderate in size, with only a small proportion consisting primarily of coniferous species. Collaboration with NGOs over the past decade was relatively common. In terms of recent changes, some CFUGs reported increased income and wildfire activity in the past year compared to the previous decade. Additionally, over half of the leaders had experience in local government, underscoring the overlap between community forest governance and broader political engagement.

We found that the indicators of values and motives, such as self-direction, stimulation, hedonism, security, humility, universalism, power, and achievement, had higher mean values, showing that leaders resonated most with these values and motives (Table 2). For instance, the mean value for humility is 2.95, indicating that the majority of respondents identify with this value and that it resonates with their motivation for taking on leadership roles in CFUGs. Values and motives such as face, conformity, reciprocity, and local institutions had lower mean scores, indicating weaker resonance among leaders.

4.2. Result of exploratory factor analysis

Table 3 illustrates the improvements in the EFA models after systematic removal of the indicators of values and motives. The parallel analysis scree plot presented in Fig. 4 compares the empirical and simulated eigenvalues to determine the appropriate number of factors to retain. Based on this, we retained a three-factor model with eigenvalues greater than one. The results show that the final iteration, Model 5, exhibits a better goodness of fit and an ideal compromise between simplicity and explanatory capacity. The root mean square of the residuals was 0.07, the cumulative variance explained was 70 %, and the fit based on the off-diagonal values was 0.97, suggesting that the three-factor model effectively captured the majority of the relationship among variables. Moreover, multiple R-squared scores for the factors were 0.88, 1, and 0.94, further supporting the reliability of the factor scores.

Table 4 displays the final three-factor EFA model with eight values and motive indicators, finalized after several iterations, in which indicators with cross-loadings and low loadings were removed. This optimized model illustrates the primary values and motives that influence leadership motivations to engage and lead CFUGs in leadership roles. The factor loadings exhibit robust strength, ranging from 0.6 to 1, with the first factor accounting for 30 % of the variance and the second and third factors each explaining 20 %. The sum of the square loadings demonstrated the comparative significance of the factors. Additionally, the commonality values span from 0.5 to 0.9, suggesting that the factors

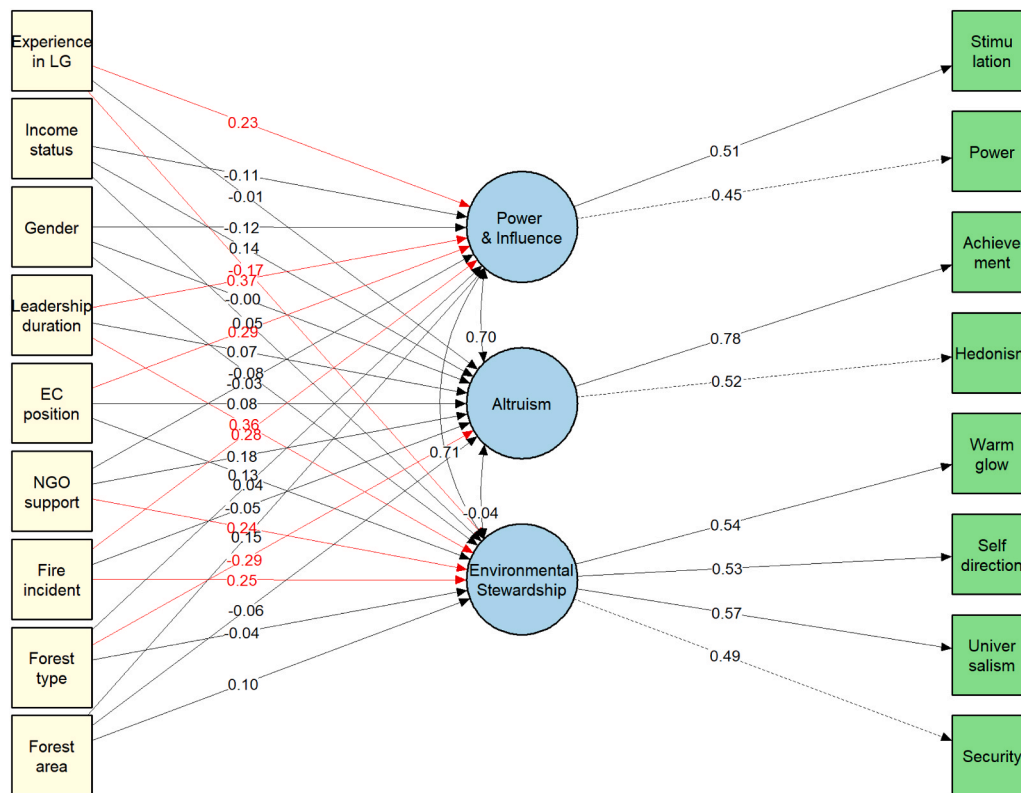


Fig. 5. MIMIC model examining the effect of covariates on the three latent motivation factors. Red lines indicate statistically significant associations between the covariates and latent factors. Numerical values on the left side of the latent factors represent standardized regression coefficients (i.e., the effect of covariates on the latent variables). The values on the right side—linking latent factors to observed indicators—are standardized factor loadings. These loadings may differ from those in Table 4 because Fig. 5 reflects results from a confirmatory factor model (within the MIMIC framework), whereas Table 4 presents results from an exploratory factor analysis. Coefficients shown are standardized, which illustrate the relative strength of associations, while unstandardized results (Table 5) are used for interpretation in original measurement units. All the factor loadings were statistically significant ($p < 0.05$).

Table 4
Final three-factor EFA model of values and motives driving CFUG leadership engagement.

Indicator variables (survey statement)	Factor 1 as Environmental stewardship-oriented leadership motivation	Factor 2 as altruistic-oriented leadership motivation	Factor 3 as Power and Influence-oriented leadership motivation	Commonality
Self-direction	0.7			0.5
Security	0.9			0.7
Universalism	0.6			0.5
Warm glow	0.7			0.5
Hedonism		1.0		1.0
Achievement		0.7		0.9
Stimulation			1.0	0.8
Power			0.5	0.4
Sum of squared loadings	2.1	1.7	1.7	5.5
Proportion of variance explained	0.3	0.2	0.2	0.7

explain a considerable portion of the variance for most variables. Out of 16 indicators of leadership values and motives, we found eight indicators that explained the core values and motives and clustered them into three factors, indicating three axes of leadership motivation in Nepal’s CF program. The first factor comprises four values and motive

indicators: self-direction, security, universalism, and warm glow. Self-direction comprises leaders’ freedom to innovate for CFUG management; security pertains to safety and stability in the community; universalism describes their commitment to equality, justice, and equity in forest governance; and warm glow represents doing something to boost one’s image in one’s own eyes or in the eyes of other people (Table 2). Factor 1 was defined as environmental stewardship-oriented leadership motivations. The second factor comprises two values and motive indicators: hedonism and achievement. Hedonism explains that leaders’ joy and satisfaction are driven by CFUG engagement, whereas achievement relates to the desire to contribute to the community’s sustainable development. Factor 2 was defined as altruistic value-oriented leadership motivation. The third factor consisted of two values and motive indicators: stimulation and power. Stimulation denotes leaders’ desire to bring about positive changes in the community, while power represents the desire to influence others in the community. Factor 3 was defined as the power and influence-oriented leadership motivation.

4.3. Result of MIMIC model

The MIMIC model quantifies the effects of the eight covariates on the factor structure of three groups of leadership motivation in Nepal’s CF. Table 5 shows that MIMIC has a good model fit ($\chi^2 = 67.04$, $df = 62$, $p = .30$, $RMSEA = 0.02$, $SRMR = 0.05$, $CFI = 0.97$, and $TLI = 0.94$). Fig. 5 presents standardized regression coefficients showing the relative importance of each predictor, including the covariance between latent motivation factors. Because these are standardized estimates, some paths (e.g., NGO support, fire incident) appear statistically significant in the figure but are weaker in the unstandardized results reported in

Table 5
MIMIC model result showing effect of covariates on three latent factors.

Covariates	Factor 1		Factor 2		Factor 3	
	Coefficient	% log odds	Coefficient	% log odds	Coefficient	% log odds
<i>Leader Characteristics</i>						
Gender	-0.04 (0.05)	-8.1	-0.002 (0.07)	-0.3	-0.05 (0.07)	-11.5
EC position	0.07 (0.05)	13.9	0.06 (0.08)	8.9	0.14 (0.07)**	34.1
Leadership duration	0.01 (0.003)***	43.1	0.003(0.005)	7.0	0.01 (.004)**	44.8
<i>CFUG characteristics (Situational variables)</i>						
Forest size	0.001 (0.001)	10.9	-0.000 (0.001)	-5.8.	0.001 (0.001)	16.7
Forest type	-0.03 (0.07)	-4.20	-0.29 (0.13)**	-24.9	0.03 (0.09)	4.6
NGOs support	0.11 (0.05)**	28.24	-0.03 (0.07)	-5	0.13 (0.07)**	32.01
Fire incident	0.17 (0.08)**	26.5	0.21 (0.13)	19.9	-0.02 (0.10)	-2.5
Income status	0.02 (0.05)	5.3	0.09 (0.08)	14.5	-0.05 (0.07)	-10.27
Experience in LG	-0.07 (0.05)*	-16.1	-0.003 (0.07)	-0.5	0.11 (0.06)*	26.01

Standard errors are in parentheses. Notes: $\chi^2 = 67.04$, $df = 62$, $p = .231$, $RMSEA = 0.02$, $SRMR = 0.05$, $CFI = 0.97$, and $TLI = 0.94$

* $p < .1$

** $p < .01$

*** $p < .001$

Table 5. This difference reflects the effect of rescaling variables into standard deviation units rather than a contradiction in the findings. Thus, we rely on Table 5 for substantive interpretation and use Fig. 5 only to compare relative strengths of associations. The latent variables showed statistically significant ($p < 0.05$) factor loadings (path coefficient ranging from 0.45 to 0.78) on their respective indicators (Fig. 5, Table S2), supporting the robustness of three-factor structural relationships in the presence of eight covariates.

Overall, the results suggest that both individual leadership characteristics (e.g., leadership position and duration, forest type, NGO support, fire incidence and experience in local government) are associated with leadership motivation that drives voluntary leadership roles within CFUGs. Contrary to our predictions, we found that gender, forest size, and income status of the forest user group have no statistically significant relationship with leadership motives.

Among the leadership characteristics, holding a chair position in the executive committee shows a strong and positive association with power and influence motivation (Factor 3) ($\beta = 0.14$, $p < 0.05$), with a percent log odds value of 34.1, implying that chairs are 34 % more likely to have values and motives linked to power and influence than leaders in other roles.

Similarly, leadership duration was positively associated with environmental stewardship motivation (Factor 1) and power and influence motivation (Factor 3). Particularly, for each additional year, the likelihood of exhibiting environmental stewardship motivation values increases by 43 % and power and influence motivation values by 45 % (Table 5).

Regarding covariates related to the characteristics of CFUGs, forest type had a significant negative association with altruistic motivation (Factor 2), suggesting that CFUG leaders managing coniferous forests are 25 % less likely to be motivated by altruistic values than leaders in broadleaf or mixed forests. Fire incidents showed a significant positive association with Factor 1, indicating that CFUGs experiencing more frequent fires in recent years tend to have leaders who are more likely to be motivated by environmental stewardship values than CFUGs with fewer forest fires. We found that, NGO support positively influences environmental stewardship and power and influence motivation values, but not altruistic motivation values. This suggests that external partnerships encourage environmental stewardship and power-related motivations. Similarly, we found that CFUGs with leaders who currently serve or have previously served in local government are significantly less likely to be motivated by environmental stewardship values, as indicated by a negative association corresponding to a 16.1 % decrease in log odds. Conversely, these leaders are significantly more likely to be motivated by power and influence values, as shown by a positive association (26.0 % increase in log odds).

The standardized regression coefficient in Fig. 5 shows the strength of each covariate that influences the latent motivation factors. For instance, among the explanatory covariates used in this model, leadership roles such as leadership duration and holding a chair position are the strongest predictors shaping the CFUG's leadership environmental stewardship motivation (Factor 1) and power and influence motivation (Factor 3). Similarly, the coniferous forest type had a strong negative association with Factor 2 (self-enhancement motivation).

We found significant positive correlations between environmental stewardship (Factor 1) and power and influence (Factor 3) ($r = 0.71$, $p = 0.011$) and between altruism (Factor 2) and power and influence ($r = 0.704$, $p = 0.015$) (Table S3, Fig. 5). This suggests that CFUG leaders motivated by either environmental stewardship motivation or altruistic motivation are also likely to be driven by power and influence motivation. However, environmental stewardship and altruism motivation are not correlated, indicating these motivations are distinct.

5. Discussion

5.1. Values alignments and leadership motivation in CFUGs

We developed a set of indicators to elicit the values and motives of leaders in Nepal's CF program. We found that community forestry leaders are motivated by a diverse set of personal values clustered into three motivation factors, which we interpret as three leadership types. The first motivation factor is characterized by values such as self-direction, security, universalism, and warm glow of giving, describing environmental stewardship-driven motivation. This aligns with prior research that highlights the role of self-transcendent and prosocial values in sustaining voluntary leadership (Kulkarni and Indira, 2015; Wondimneaw and Adal, 2023).

The second motivation factor reflects self-enhancing altruistic-driven motivation associated with values such as hedonism and achievement. These values indicate that personal fulfillment and social accomplishment also play a role in driving engagement in collective forest management (Jagers et al., 2020).

The third motivation factor includes values such as stimulation and power, highlighting power and influence-oriented motivation. Leaders motivated by this factor seek to bring positive change and gain influence within their community, aligning closely with Andersson et al. (2020), who argue that unselfish leaders, those motivated by a desire to lead change and support collective goals, are vital for overcoming uncertainties and fostering self-governance. Such leaders derive satisfaction not just from outcomes, but from the act of leading itself.

Together, these findings suggest that voluntary leadership in Nepal's CF is not only shaped by environmental stewardship and community-

centered values but also by motivations linked to self-recognition and ambition. Recognizing this diversity in leadership motivation may play a role in developing strategies for identifying, supporting, and cultivating future leaders in Nepal's evolving community forestry landscapes.

The results also reveal the correlation among three motivation factors (Fig. 5). The finding that power and influence traits correlate with environmental stewardship values indicates that leadership roles in CFUGs may provide a platform for both stewardship and social ambition, inferring that individuals with strong environmental persuasion may still seek power to accomplish their goals more effectively. This is closely linked to social exchange and self-determination theories, which suggest that power is instrumental in fulfilling environmental goals (Deci and Ryan, 2000).

Similarly, altruistic values correlate with power and influence, implying that leadership in CFUGs may not be solely altruistic or community serving. Both associations suggest that leaders motivated by self-enhancing altruistic and environmental values typically also seek power and influence to achieve their goals. While this challenges the idea that leaders are either selfish or selfless, this finding is in line with the view that leadership is driven by a mix of human motivations (Chan and Drasgow, 2001). In community forestry, where leadership often entails facilitating collective action and institutionalizing forest governance, power and influence may not be negative qualities but rather functional attributes. Leaders motivated by power and influence may be better positioned to lead reforms, attract external funding, or execute group rules (Harrell and Simpson, 2016), particularly in the context of declining forest dependence or increasing socio-economic heterogeneity.

The results on motivation factors are especially interesting because they emphasize the need for leadership development in CFUGs to recognize and connect multiple motivational pathways. For instance, leadership training cannot assume a single "ideal" style of leader (e.g., self-sacrificing environmentalists) but might consider leaders balancing personal aspirations with community and ecological goals. Power and influence values are pivotal in driving voluntary leadership, particularly in structured resource governance contexts (Van Doorn and Raz, 2023; Agrawal et al., 2023). Although power-seeking incentives are desirable, they may be accompanied by elite capture (Gautam et al., 2023) and structural gender bias (Agrawal, 2001; Nightingale, 2002; Baral et al., 2024). On the other hand, environmental stewardship and altruism motivations are not correlated, suggesting that leaders are motivated either by protecting and managing the environment or by the desire to serve their community and improve social welfare, but not necessarily both at once.

5.2. Factors associated with voluntary leadership motivations

We found that leadership in the chairperson role is positively associated with power and influence-oriented leadership motives. This may reflect both the greater authority of chairs (such as decision making and agenda setting) and the tendency of power-oriented individuals to pursue such roles, suggesting that personal ambition and identity influence top leadership selection (Acharya and Gentle, 2006; Ojha et al., 2009; Tallberg, 2010). While power-driven motivation is often viewed with skepticism in collective resource governance, it is also possible that it can enhance leadership outcomes if aligned with the group goals (Clemmons and Fields, 2011; Cabbage, 2021).

Similarly, the study reveals that leaders with longer tenure are more inclined toward values related to environmental stewardship as well as power and influence motivation. This is consistent with the finding that leadership experience influences motivation over time (Chan and Drasgow, 2001), enhancing both individual commitment and the capacity for collective action. These results reflect that more experienced leaders may have witnessed the social and ecological impacts of forest management decisions, leading to stronger environmental ethics. Their longer experience-based knowledge and networks can also augment

their influence and ability to navigate institutional systems, further increasing power motivation in a constructive manner.

However, this rationale also points to contradictions. While experienced leaders may be highly motivated and capable, the CFUG system is increasingly facing challenges in terms of leadership sustainability. Studies show that leadership fatigue is rising because of over-reliance on a few leaders, while newer or younger members are often reluctant to step into leadership positions (Laudari et al., 2024; Baral et al., 2024). In some CFUGs, leadership role substitution among the same individuals occurs repeatedly (Poudyal et al., 2023), potentially leading to stagnation, limited innovation, and reduced inclusiveness (Fujimoto and Uddin, 2021; Baral et al., 2024). Although longer durations can enhance motivation and performance, over-dependence on long-serving leaders may hinder leadership renewal and generational transition.

Therefore, mechanisms to mentor new leaders that encompass environmental stewardship and power and influence value traits while promoting youth and marginalized groups may help balance experiences with renewal of leadership. This could ensure that CFUGs benefit from both deep-rooted commitment and diverse, evolving leadership. Evidence shows that mentoring plays a crucial role in cultivating environmental leaders, particularly among youth and marginalized groups. For instance, Erhabor (2018) emphasizes mentorship's integral role in developing effective environmental leaders who can build sustainable societies. Similarly, in Nepal, programs such as RECOFTC's grassroots leadership training and EnLiFT2's exposure visits have shown that mentoring and capacity building can successfully cultivate new leaders in community forestry (RECOFTC, 2022; Tiwari et al., 2023).

The results also suggest that leadership motivation in CFUGs varies significantly based on biophysical and institutional characteristics. Notably, leaders managing coniferous forests are less likely to be motivated by altruistic values than those managing broadleaf or mixed forests. This might be linked to the ecological and economic distinctions between forest types. Coniferous forests, particularly pine, which are prevalent in Nepal's mid-hill area, are often associated with negative ecological perceptions, such as reduced streamflow and drying of water springs (Badu et al., 2019), which can diminish perceived communal benefits and reduce altruistic engagement. In addition, because pine forests are generally more valuable and efficient for timber production (Gautam et al., 2004), leaders in these areas might be more oriented towards production and economic returns and less towards altruism.

In contrast to earlier assumptions that increased fire incidence heightens management burden and stress and discourages leadership (Lang et al., 2006; Budiningsih et al., 2020), our results indicate that CFUGs experiencing more frequent fires are often led by individuals more strongly motivated by environmental stewardship values. A possible explanation could be that fire-risk CFUGs require more participative and proactive leadership, thus attracting individuals who are energized by environmental problems. Similarly, the finding supports the existing literature that external partnerships or support from NGOs is important for driving environmental stewardship values and power and influence related motivations among CFUG leaders. NGOs support may contribute to strengthening environmental values through capacity building and the supply of financial and technical resources while reinforcing power and influence values by increasing leaders' visibility and networks (Neba, 2009; Gupta et al., 2020; Cook et al., 2023).

The observed negative correlation between CFUGs with leaders serving or having served in local government and environmental stewardship values, alongside a positive correlation with power and influence values, may reflect an important shift in leadership motivation within CFUGs following Nepal's move to federalism. Leaders with experience in local government may govern community forests with a reduced emphasis on environmental and community welfare values, instead prioritizing political assets, authority, and influence. This suggests a changing incentive structure as governance becomes more decentralized and local governments gain greater control, with community forestry leadership appearing to be increasingly intersecting

with political aspirations.

The findings suggest important implications. Recognizing the legitimacy of multiple motivational pathways, including personal ambition, identity, and prosocial values, can inform adaptive and supportive leadership development strategies. These findings also have implications for sustaining participation in community-based forest management institutions. Particularly those such as CFUGs that are increasingly affected by elite capture, where powerful local elites are usually selected as CFUG leaders more frequently than the poor and marginalized (Agrawal and Gupta, 2005; Agrawal and Chhatre, 2006; Ostrom, 2009; Yadav et al., 2014; Gautam et al., 2023). Understanding leadership motivation can inform strategies to revitalize participation among youth, women, and marginalized groups by designing incentives and trainings that resonate with personal and social values. This also helps commons institutions to remain more inclusive, adaptive, and resilient.

A couple of limitations are worth noting when interpreting the study results. First, the sampling method only included current CFUG leaders, excluding the opinions of non-leaders, which might have been subject to selection bias and could reduce the generalizability of the observed motivational patterns. Second, the survey did not elicit information on some important explanatory variables (such as leaders' age, education level, occupation, and governance-related factors such as participation in forest governance and management), since we opted for a relatively short questionnaire in order to promote careful consideration of the questions and completion of the full interview. Future research may also integrate perceptions of both leaders and non-leaders within CFUGs, along with behavioral and institutional attributes, to provide a complete understanding of the dynamics influencing voluntary leadership in community-based forest management in Nepal and beyond.

6. Conclusion

In this study, using survey data from 144 executive committee members across 49 community forest user groups in two mid-hills districts of Nepal, we explored the key values and motives of CFUG leaders through a set of indicators that revealed latent motivation factors. Second, we examined how leader characteristics (e.g., gender and position) and forest conditions (e.g., size, type, fire incidence, regeneration status, NGO support and leaders' experience in local government) are associated with these motivations. The study shows that out of the 16 indicators of values and motives, eight best explained core values and motives clustered into three latent motivation factors that are key to motivating voluntary leadership in CFUGs in Nepal. These findings suggest that sustaining leadership in Nepal's CFUGs requires not only structural reforms and inclusive practices but also a deeper understanding of value-sensitive motivations driven by a combination of environmental stewardship, altruism, and power/influence values.

The findings also demonstrate the importance of contextual factors in shaping leadership motivation. Factors such as leadership position, duration, forest type, external support from NGOs and CFUGs with leaders serving or having served in local government play crucial roles in influencing leaders' motivations for working in the CF program in Nepal. Leadership roles as chairperson could both attract and offer a platform for both stewardship and ambition, as power and influence seeking leaders may be more capable of mobilizing resources, implementing decisions, and sustaining institutional efforts, provided appropriate checks and accountability mechanisms are in place. Longer tenure can build commitment – or reflect committed leadership - but also could lead to stagnation and overreliance on the same individual. Forest type, NGO support, and fire incidence results suggest the need for ecological investments and institutional support to enhance the quality of governance. Similarly, federalism and political linkage through local governments could reflect a shift in the incentive structure, where political interest may increasingly intersect with CF, suggesting that policy-makers need to give more attention to avoiding elite capture. These findings can contribute to more inclusive, resilient, and sustainable

community forestry practices by informing effective strategies for identifying, developing, and sustaining voluntary leadership in Nepal's evolving community forestry landscape.

CRedit authorship contribution statement

Prabin Bhusal: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Gregory E. Frey:** Writing – review & editing, Supervision. **Conghe Song:** Writing – review & editing, Supervision, Funding acquisition. **Erin Sills:** Writing – review & editing, Validation, Supervision, Conceptualization. **Rajan Parajuli:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization.

Author statement

We ensure that the paper meets all the ethical and publication criteria of Environmental Science and Policy journal and is not under consideration for publication in any other journal.

Declaration of Competing Interest

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.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.envsci.2025.104220](https://doi.org/10.1016/j.envsci.2025.104220).

Data availability

Data will be made available on request.

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