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RESEARCH ARTICLE



Toward vulnerability-responsive climate adaptation decision making: group inclusiveness as prime driver of local participation

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ABSTRACT

Although inclusive local participation in climate adaptation is touted as the panacea to ensure that project outcomes serve the needs of the most vulnerable, there is no objective measure for group inclusiveness. This study departs from the existing psycho-affective scales and employs principal factor analysis to compute a communicative practice-based inclusiveness scale (CoP-BIS). CoP-BIS measures group inclusiveness with five indicators—ideas solicitation, acknowledgment of views, views utilization, feedback provision, and member involvement. Ordinary least squares analytical procedure is applied to estimate the association between group inclusiveness and group members' participation in decision making, based on data from a survey with 225 respondents randomly sampled from farmers' and fishers' groups in Ghana's Effutu Municipality. We found that group inclusiveness has a statistically significant positive association with all three dimensions of participation (*feeling encouraged to participate*, *willingness to make efforts to participate*, and *actual participation*) in adaptation decision making at the 1% alpha level when other relevant factors are controlled for. Thus, fostering group inclusiveness through inclusive communicative practices is critical in promoting diverse participation in adaptation decision making. The implications for policy and practice are discussed.

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group inclusiveness;
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Introduction

The need for communities to be involved in local development and social change processes is well established (see Koomson, 2024; Melkote & Steeves, 2015). Participatory climate adaptation takes a cue from this and is fast gaining traction as the way to ensure that adaptation processes benefit from diverse inputs and that adaptation measures prioritize local needs, especially for the most vulnerable (see Buggy & McNamara, 2016; Lioubimtseva, 2022). Also, the scientific complexity and uncertainties about climate change support the decentralization of climate adaptation decision making to involve diverse local participation and incorporation of local knowledge toward sustainable adaptation (e.g. Buggy & McNamara, 2016; Fung, 2006; IPCC, 2018; Munaretto et al., 2014). Local participation is essential because local people possess relevant local ecological knowledge gained through their long and close exposure to the situation or the context in which the problem exists (Fung, 2006). Local people are not only capable of noticing minor changes in ecosystems, but they can also respond to such feedback from the ecosystem (Fabricius & Collins, 2007; Fung, 2006).

However, adaptation actors operate in a socio-ecological system with multilevel processes involving cross-level interactions among actors with diverse interests and power to prosecute their agenda (Bisaro et al., 2010). Climate adaptation involves various technical, institutional, legal, educational, and behavioral actions, usually incorporated into sectoral initiatives like water management planning, agricultural policy, and risk

reduction strategies (Munaretto et al., 2014). Paradoxically, most climate action policies are formulated at the global or national levels or, at best, at the municipal level (E.K. Chu, 2018; Takao, 2012), but climate change impacts are felt at the local level. The process is inherently 'fraught with inequities in social relations, struggles over who has the right knowledge, and who is authorized to govern and guide change' (Eriksen et al., 2015, p. 531). Consequently, community participation often does not serve the needs of some segments of society, usually the marginalized and most vulnerable sections of society, as the local elite tend to capture the participation process (Buggy & McNamara, 2016; E.K. Chu, 2018; Lioubimtseva, 2022; Lund & Saito-Jensen, 2013; Mansuri & Rao, 2013).

The literature provides considerable insights into how sociopolitical structures and cultural systems shape local participation in adaptation planning, which kinds of local people participate, and how (Buggy & McNamara, 2016; P. Koomson, 2023a; Mansuri & Rao, 2013). Koomson (2023a) found that several sociocultural and structural challenges, as well as deficits in the practices of project initiators, constrain the involvement of marginalized social groups like women in climate adaptation decision making. Improvement in inclusive adaptation planning processes results in higher climate equity and justice outcomes (E. Chu et al., 2016). Involving diverse stakeholders in adaptation decision-making poses fundamental challenges that are embedded in power relations (Few et al., 2007), which require situational communication

strategies that address cultural barriers (P. Koomson, 2023a, 2023b). Groups that explicitly communicate the approaches and objectives of adaptation among local participants realize project objectives (Uittenbroek et al., 2019). These findings emphasize the critical role of communication in fostering inclusive local participation that yields desirable adaptation outcomes. However, not much attention has been given to how local groups' communicative practices shape the dynamics and diversity of local participation in adaptation initiatives. Also, studies that focus on measuring and analyzing the relationship between group inclusiveness and inclusive local participation in adaptation planning seem to be missing in the literature. To the best of the authors' knowledge, no such study exists despite the enduring calls for local participation in climate adaptation to be inclusive (Buggy & McNamara, 2016; P. Koomson, 2023a). Thus, we know little about how communicative practices within local groups shape the dynamics of local participation and the extent to which individuals' views group inclusiveness shapes their participation in adaptation decision making.

Considering this observed gap, we contribute to the literature by answering the overarching question: What is the relationship between group inclusiveness and individuals' participation in participatory adaptation decision making, and how do communicative practices shape group inclusiveness? Thus, this study quantitatively captures group inclusiveness and participation and analyzes the relationship between the two variables in the context of climate adaptation decision making. We account for some important socio-demographic characteristics like age, educational status, gender, duration of group membership, and leadership status as control variables in the analysis. In terms of methodology, the study provides a communicative practice-based inclusiveness scale (CoP-BIS) for measuring and analyzing local engagement toward inclusiveness in participatory climate adaptation initiatives.

The rest of the article flows as follows: Theoretical and conceptual issues; comparison between CoP-BIS and other inclusiveness conceptions and measures; study site and background; method and methodological limitations; results of the analysis; discussion of results and implications; and conclusion and limitations.

Theoretical and conceptual issues

Relationship between group dynamics and group inclusiveness

The theory of social inclusion provides a useful theoretical lens for examining how group inclusiveness and other demographic peculiarities shape local participation in climate change adaptation decision making. Inclusion refers to 'the degree to which an individual perceives that the group provides him or her with a sense of belonging and authenticity' (Jansen et al., 2014, p. 373). A group's efforts to include an individual member can signal the group's valuation of the member (Jansen et al., 2014). Perceptions of social inclusion evolve over time and are shaped by individual and group goals of inclusion and outcomes (Jansen et al., 2020).

Inclusion is an essential driver of individuals' overall willingness to contribute their ideas and actions toward civic activities (Edmondson & Lei, 2014). It also ensures that the outcomes of civic activities like climate adaptation serve the priority needs of the most vulnerable and marginalized people and groups (Buggy & McNamara, 2016; Takao, 2012). A group member's perception of their inclusion is critical for their well-being and influences their commitment and contributions to the group (DeWall et al., 2011; Jansen et al., 2014, 2020).

Inclusiveness can be observed along personal or social attributes like leadership style, gender, age, leadership status, and longevity of group membership (see Davidson, 2016; Schwartz, 2006; van der Geest, 1997). Inclusive groups leverage diverse members' backgrounds as a strength to attain group goals rather than assimilate all members into dominant norms (see Vohra et al., 2015). Group inclusiveness hinges more on the group's efforts to include the individual rather than the individual's efforts to be included (DeWall et al., 2011; Ellemers & Jetten, 2013). However, an included individual may not necessarily contribute more favorably to their group's activities, particularly when the individual's desire to belong is low (Ethier & Deaux, 1994; Greenaway et al., 2015). Jansen et al. (2020) found that individual and group motivations for inclusion mutually influence each other over time, and the two must align to make inclusiveness count, making the duration of group membership an important dimension in the measurement of inclusiveness. Based on this review, we hypothesize that H1: Group inclusiveness is positively associated with an individual's participation in their group's climate adaptation decision making. We also test H2: The more years an individual spends with a group, the more the person is willing to participate in the group's climate adaptation decision making.

Leadership styles, leadership status, and group inclusiveness

Effective local leadership is central to local involvement and coordination of local actions in participatory climate adaptation deliberations to attain the esteemed cognitive virtue of producing knowledge informed by the fusion of external expertise and local insights for addressing climate change (Buggy & McNamara, 2016; Fung, 2006).

A group member's perception of how well they are included depends on cues the group sends to the individual (Jansen et al., 2014), as individuals continuously observe their social settings for signals about their inclusionary status (Leary & Baumeister, 2000). Leaders' cues about inclusion are the most consequential in this regard (see Jansen et al., 2014; Shore & Chung, 2022), making leadership styles equally critical in shaping members' perceptions of inclusiveness. While members of dominant groups are inclined to feel included in their groups, inclusive leadership is particularly important for members of marginalized social identity groups (Shore & Chung, 2022). Leaders must be transformative by acknowledging and taking advantage of diversity through the creation of structures, systems, and processes that make their members feel welcomed, valued, treated equitably (see Ashikali & Groeneveld, 2015; Ayman & Korabik, 2010; Derven, 2014), and

psychologically safe to contribute their ideas and actions to the group's shared enterprise (Edmondson & Lei, 2014).

People's unique experiences with several dimensions of inclusiveness (including fairness, openness, cooperation, support, and empowerment) influence their perceived group inclusiveness (Nelson & Piatak, 2021). From the perspective of communication and engagement, virtues like deliberative wit, friendliness, empathy, charity, temperance, courage, sincerity, and humility (Aikin & Clanton, 2010) translate into leaders' efforts to develop an inclusive culture—using a two-way information flow with well-defined feedback and avoidance of traditional authoritative leadership to ensure members understand the tasks at hand (Aikin & Clanton, 2010; Lund, 2015). In practice, this also implies soliciting members' ideas, acknowledging and utilizing members' views in decision making, and involving members in interactions with external partners when possible.

From face value, it seems plausible to assume that leaders, per the power of their position, would be inclined to feel included in their groups (Shore & Chung, 2022). But Hoogervorst et al. (2012) suggest that not all leaders feel a sense of belongingness in their group and that leaders who feel socially included in their group tend to moderate their power and self-interest for the group's well-being. This is particularly true for minority and marginalized groups, as personal attributes align with social identity—a socially-constructed attribute that may be self-defined or imposed by other social groups. Indeed, research suggests that minority women leaders feel less included in their organizations and are perceived as 'outgroup' members (see Mor-Barak, 2013; Nelson & Piatak, 2021), thus hindering their promotion and excluding them from their organization's information, resource, and power networks (Mor-Barak, 2013). Women leaders 'face gender stereotypes and role incongruity with perceptions of what a leader should look like' (Nelson & Piatak, 2021, p. 307). Per our assumption about the role of personal attributes of leaders and the empirical insights, which suggest that leaders are more likely to feel included in their groups, we test H3: Leadership status positively influences an individual's participation in their group's adaptation decision making.

Gender dimension of inclusiveness in adaptation decision making

Climate change disproportionately impacts women and their livelihoods, especially in the global south (Alhassan et al., 2019; Alston, 2018; Sen Roy, 2018; Sultana, 2014). Similarly, women's efforts to adapt to climate change often pose new challenges for them (Jost et al., 2016), although being women already disadvantages them in many ways. Yet, patriarchal biases in agricultural organizations around the world often make them overlook women's needs for information, fertilizers, seeds, and subsidized tools (Jost et al., 2016). In some settings, women may be included in decision making but are restricted by norms that are not easy for them to override (Arora-Jonsson, 2011; Carr, 2008).

When one combines (i) the empirical evidence about the systematic exclusion of women from climate adaptation planning (Akinsemolu & Olukoya, 2020; P. Koomson, 2023a)

despite women's interest in climate change with (ii) theoretical insights about how women's experiences in traditional societies render them less likely to participate in public engagements (Mansuri & Rao, 2013), it becomes relevant to examine women's willingness to contribute to climate change adaptation decision making. This is because discriminatory practices and dependence on existing knowledge structures in adaptation initiatives can make women and other marginalized social groups consider themselves as not belonging to the core decision-making group. However, these insights have been underexplored in the examination of gender concerns and exclusionary practices in climate adaptation initiatives. Based on these insights, we hypothesize and test H4: Females are more willing to participate in their groups' adaptation decision making than males. This hypothesis is also informed by the empirical evidence about women's relative higher vulnerability to the impact of climate change (Alhassan et al., 2019; Alston, 2018), and they express slightly more concern about climate change (McCright, 2010; Sundblad et al., 2007). Also, women's numerical dominance at climate adaptation planning fora at the study site (P. Koomson, 2023a) suggests that women would be more interested in contributing to climate adaptation change decision making.

Educational status, life stage, and inclusion

Due to adaptation initiators' tendency to rely on established decision-making structures and knowledge sources (E.K. Chu, 2018; Lund & Saito-Jensen, 2013), one's level of education—often perceived as a measure of their social status, exposure, experience, knowledge base, or intellectual capacity—plays a key role in gaining access to the decision-making table on important issues (see e.g., Hsieh & Winslow, 2006; Nelson & Piatak, 2021) like climate change (Fung, 2006; Munaretto et al., 2014). Educational attainment also influences a person's leadership status and perceptions about their group's inclusiveness (Hsieh & Winslow, 2006). Well-educated individuals tend to be the ones who are likely to be involved when participatory initiatives allow random self-selection of participants, but such participants may not be representative of the larger community of potential beneficiaries (Fung, 2006). Conversely, less privileged persons are less likely to have the urge or capacity to represent their communities adequately through their contributions to deliberations (Fung, 2006), leaving the dominant actors to control the process. Thus, we test H5: Educational status is positively associated with individuals' participation in their groups' climate adaptation decision making. This hypothesis is informed by the evidence in the literature, which suggests that adaptation initiators tend to rely on established decision-making structures and that adaptation projects are often dominated by local elites or highly educated persons who also tend to be socially included.

In a hierarchical and collectivist society like Ghana, where power differences are clearly established (Schwartz, 2006), prevalent age-based authority manifests in public activities (Slade Shantz et al., 2020). Elders known as *mpanyinfo*¹ (mostly advanced-age men) occupy positions of authority and receive privileged treatment from their communities (P. Koomson, 2023b; van der Geest, 1997). The youth defer to the elderly,

who tend to bear the responsibility and privilege of making decisions and speaking for their groups (van der Geest, 1997). In Ghana, groups with such established hierarchical control arrangements experience more conflict and less psychological group ownership (Slade Shantz et al., 2020). Slade Shantz et al. conclude that such experiences with hierarchical control arrangements can influence participation, especially for younger members. Informed by these insights that young people defer to older people as spokespersons in Ghanaian society, we hypothesize and test H6: Age is positively associated with an individual's participation in adaptation decision making.

CoP-BIS versus other inclusiveness conceptions and measures

The development of a new scale for measuring and analyzing inclusiveness is inspired by insights in the literature on *perceived* group inclusiveness. Perceived group inclusiveness depends more on a group member's subjective perceptions of their group's efforts to include them than the individual member's willingness to be included (see DeWall et al., 2011; Ellemers & Jetten, 2013). Leary and Baumeister's (2000) finding that people's continuous scanning of their social settings for cues from their groups to inform themselves about their inclusionary status reinforces this and brings into perspective the critical roles of leadership and signals (based on communicative practices) in the formation of members' sense of their group's inclusiveness scales (see e.g. Jansen et al., 2014; Shore & Chung, 2022). Based on this, perceived group inclusiveness should be seen as distinct but related to group inclusiveness. The latter can be considered to inform the former more than the reverse. Group inclusiveness can, therefore, be defined as the evolving state of a group's willingness to give its members a sense of belonging by making them feel valued and involved. This conception of group inclusiveness becomes central to the identification of the indicators in the CoP-BIS, as a group's interactions and communicative practices constitute the signals or cues of inclusionary status it sends to its members.

Taking the foregoing together with the insights that inclusiveness depends on the alignment of individual motivations with group motivations (Jansen et al., 2020) and that an individual's perceived inclusiveness is particularly low when their desire to belong is low (Ethier & Deaux, 1994; Greenaway et al., 2015), we introduced a group inclusiveness scale based on (group) leaders' communicative practices, which is meant to be a less-subjective scale for measuring and analyzing group inclusiveness. Thus, the CoP-BIS measures a group's inclusiveness rather than group members' perceived inclusiveness of the group. The CoP-BIS, therefore, departs from what may be described as psycho-affective scales (see e.g., Jansen et al., 2014; Shore & Chung, 2022) and uses ratings or rankings of directly experienced and observable indicators, including leaders' solicitation of members' ideas for decision making, acknowledgment and utilization of members' views in decision making, feedback provision, and involvement of members in meetings with external partners.

Study site and background

Rural communities in the Effutu Municipality of Ghana (see Figure 1 below) in West Africa served as the site for this study. This coastal municipality is located in the southern part of Ghana and lies along the Gulf of Guinea. The main economic activities of the indigenes include fishing and farming. Because these activities depend on nature, the livelihoods of the people are heavily impacted by the ramifications of climate change, especially erratic and drastically reduced rainfall (see Ankrah, 2018; EMA, 2018). In response, the local people, the Effutu Municipal Assembly (EMA), and other local government agencies like the agriculture directorate are undertaking multiple adaptation measures. These include the promotion of sustainable fish smoking methods and technologies like the *ahotor* stove² to mitigate carbon dioxide (CO₂) emissions and the consequent impact on the climate; provision of vocational skills training (like soap, bead, or tie-dye making) and start-up capital for the local people in the communities to assist them in diversifying their income sources (Akutse & Samey, 2015; P. Koomson, 2023a).

The EMA has been dredging rivers and constructing high-capacity storm drains to mitigate flooding associated with heavy rainfalls. For instance, it dredged the Ntakorfam Stream and planted trees to reduce its evaporation. An irrigation dam created as part of the project supplies water for year-round farming to improve the farmers' livelihoods (EMA, 2018, 2020; P. Koomson, 2023a). The municipal agriculture directorate is also promoting climate-smart agriculture. It is (i) encouraging the people to adopt early-maturing, high-yielding, and drought-resistant crop varieties; (ii) focusing farmers' attention on increased livestock raising (and providing fast-growing meat chicken breeds to farmers to cross-breed with local ones) to increase farmers' output and diversify and their income; (iii) promoting tree-crop farming, as tree crops generally require less water once they are well established and can provide higher incomes for farmers over many years; and other alternative livelihood initiatives.

Method

Sample and sampling procedure

Rural communities in the Effutu Municipality of Ghana constituted the site for this study. The study surveyed 225 leaders and members of eleven farmer and fisher groups in the municipality to test the hypotheses. The initial step involved purposively selecting the most active groups—those with established leadership structures and holding regular meetings—involved in various climate adaptation initiatives ongoing in the municipality so that their members could speak to the issues of interest: group inclusiveness and members' experiences with the dynamics of local participation in adaptation decision making within their groups (Etikan, 2016). Twelve groups were selected from 10 communities, namely: Ateitu, Atekyedo, Effutu Ekroful, Gyahadze, Gyangyanadze, Kookrom, Nsuekyire (two groups), Sankor (two groups), Silverkrom, and Woara Beba. Altogether, the selected groups had 659 members ($N = 659$). Based on Krejcie and Morgan's (1970) required sample size table, a sample size of 243 was determined to be

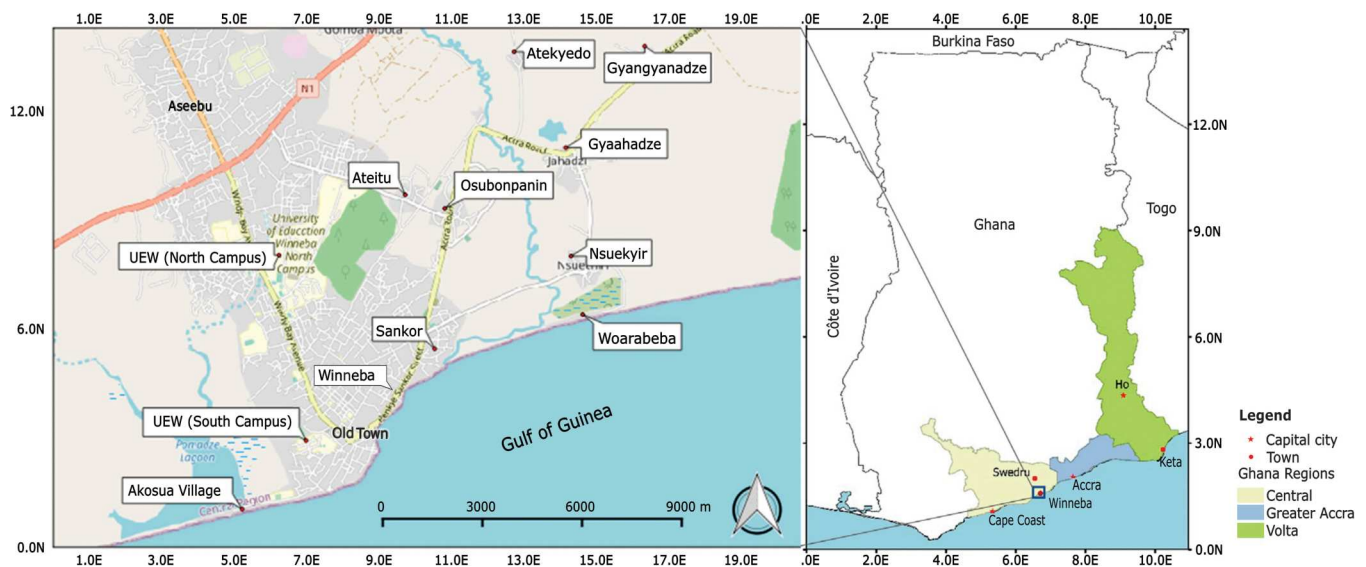


Figure 1. Effutu municipal map. P. Koomson's (2023a) adaption from Koomson et al. (2022).

sufficient, with a 95% confidence level and a 5% margin of error. With an average of 58 members per group, the sample size of 243 was divided by 12 (the number of groups) to obtain a quota of 20.25 samples to be drawn from each group. This meant we had to sample a little over 20 persons from each group. Hence, a quota of 22 respondents was allotted to each of the 12 groups that participated in the survey, yielding a sample size of 264 (which exceeds the required sample size of 243) to make up for potential incompletes, dropouts, and other unforeseen situations.

The final sample was drawn using the simple random sampling technique to give every member of a given group an equal probability of selection (Latpate et al., 2021). We obtained a list of group members from each group through their leaders. A copy of each list was then cut into pieces to have one name per piece. The pieces were then placed in a bowl and randomly drawn one by one until 22 names were drawn. This was repeated for each group to generate 264 samples to be surveyed. The remaining cutout names were kept in separate files, one for each group, to allow the researchers to replace unavailable or unwilling participants. The researchers administered the surveys face-to-face with the respondents in their homes or workplaces, depending on the individual's choice. Where respondents were not immediately available, the researchers made three attempts to get them to take the survey as a way of maximizing the response rate (see Phillips et al., 2016; Smyth et al., 2010), given that the sample size was not large but adequate. Literate respondents were given the questionnaires to complete and return. The researchers read and translated the questionnaires to the non-literate respondents, making sure to minimize any form of social desirability effect (Larson, 2019). In the end, 225 people responded, yielding a response rate of 85.23%. The 225 people sampled comprised 33.33% males, 66.22% females, and one with no sex indicated. In terms of educational level, 35.6% had no formal education; basic (primary and junior high) school: 53.8%; senior high school: 7.6%; and tertiary: 3.1%. For leadership status, 10.75% were leaders, and 89.3%

were non-leaders. The majority of respondents (79.1%) fell in the category of old people, and the rest (20.9%) were young. The sample included 24 leaders (the overall leader and their assistant from each group) and 201 members. Participants responded to questions about their groups' inclusiveness, their participation in their groups' adaptation decision making, and demographic characteristics.

Measures

Dependent variables: participation

In this study, we employ three ordinal participation variables. The variables were captured from respondents' self-reported information. The measurement of these variables is detailed below:

Feeling encouraged to participate. This participation variable captured respondents' willingness to participate based on the feeling of encouragement to contribute their ideas to their group's climate change adaptation planning. This was captured from respondents' answers to the question: 'How often do you feel encouraged to contribute your ideas during group meetings to decide on climate change adaptation?' The response options were '1 = never', '2 = rarely', '3 = sometimes', '4 = most of the times', and '5 = always'. An upward movement on the scale reflects an increase in willingness to participate based on feeling of encouragement to contribute ideas.

Willingness to make efforts to participate. This variable measured respondents' willingness to make efforts to participate in their group's activities and meetings based on the respondent's reported level of willingness to make efforts to have their views heard and considered by their group leaders. This was captured from the responses to the question, 'What is the level of effort you are willing to make to ensure that your leaders receive and consider your views when designing climate change adaptation plans?' Responses for this question

were: '1 = very low', '2 = low', '3 = neutral', '4 = high', and '5 = very high'. An upward movement on the scale reflects an increase in willingness to participate based on effort.

Actual participation. This final variable captures respondents' actual participation in their group's activities and meetings by asking the respondents: 'Approximately how many times did you participate in activities (including meetings) organized by your group in the last year?' Responses for this question were: '1 = 1', '2 = 2–5', '3 = 6–8', and '4 = 9–11'. An upward movement on the scale reflects an increase in actual participation in decision making. These three variables form a continuum of three dimensions of participation—*feeling encouraged to participate*, *willingness to make efforts to participate*, and *actual participation*.

Independent variable: group inclusiveness scale

Following previous studies (Jansen et al., 2014; Russell, 2002), we generate our *group inclusiveness scale*, CoP-BIS, by applying principal factor analysis (PFA) to the five indicators of inclusiveness – frequency of feedback from leaders, satisfaction with use of members' views in decisions, frequency of soliciting members' ideas, frequency of including members in external meetings, and the likelihood of getting views considered. Before applying the PFA, we test for internal consistency among the indicators using Cronbach's alpha. The Cronbach's alpha for the five indicators is .789 (see Table 1), which is higher than the reliability coefficient of .70, which is considered 'acceptable' (Adadan & Savasci, 2012; Heryana, 2020). As a result, we used all five items to construct the CoP-BIS. After ensuring the internal consistency of the inclusiveness indicators, we apply the PFA and retain only factors with Eigenvalues greater or equal to one. Based on this, our group inclusiveness scale was produced from the principal factor (i.e. Factor 1) because it is the only factor that satisfies the factor selection criterion (Mooi et al., 2018). Based on the Bartlett test of sphericity reported in Table 1, we reject (at the 5% alpha level) the null hypothesis of non-collinearity among the inclusiveness indicators. The Kaiser-Meyer-Olkin (KMO) value of 0.789 is above the 0.5 threshold considered adequate for factor analysis and sampling adequacy (I. Koomson &

Churchill, 2021; Lahai & Koomson, 2020). The rotated factor loadings displayed in Table 2 indicate that all the inclusiveness indicators make adequate contributions to Factor 1. This means that the group inclusiveness scale generated using factor analysis is appropriate. A unit increase in the group inclusiveness scale reflects an increase in inclusiveness within groups.

Apart from the PFA-based CoP-BIS, we also obtain the group inclusiveness scale as an average/mean score from the five indicators of inclusiveness. This approach applies an equal weighting scheme, where a unit increase in the average score reflects an increase in group inclusiveness. This is used for robustness check purposes.

Regression model

Since the actual participation and willingness to participate variables are captured using ordinal scales, we follow previous studies (Nelson & Piatak, 2021; Tuominen & Haanpää, 2022) by employing ordinary least squares to examine the association between group inclusiveness and participation. We specify our model of interest as shown in equation 1.

$$Part_i = \beta_0 + \beta_1 Incl_i + \beta_2 Lead_i + \beta_3 Memyrs_i + \beta_4 Female_i + \beta_5 Edu_i + \beta_6 Age_i + \varepsilon_i \quad (1)$$

where *Part* represents participation for individual *i*. *Incl* is the inclusiveness scale, *Lead* is a binary variable for leaders, which is captured as 1 for leader and 0 if otherwise. *Memyrs* is the number of years one has been a member of a group, *Female* is a binary variable for gender, which is captured as 1 for female and 0 for male. *Edu* is a binary variable for formal educational status, which is captured as 1 for educated and 0 for 'no formal education'. *Age* is also binary, which is captured as 1 for an older person while 0 is for a young person. β_0 is the intercept, β_1 – β_6 are parameters to be estimated while ε_i is a random error term. The summary statistics and description of variables used in the analysis are presented in Table A1.

Methodological limitations

While this study provides important insights for improving the diversity of local participation in climate adaptation decision making through group inclusiveness, we acknowledge that the study would have been even stronger if a few modifications to the study design were feasible. Hence, the findings from the study should be interpreted with caution. Being an exploratory study that was interested in the relationship between group inclusiveness and local participation, the sample frame was limited to active fishers' and farmers' groups in one municipality, resulting in a relatively small sample size. Though the sampling frame remains relevant for the subject matter of

Table 1. Principal factor analysis of inclusiveness indicators.

Factor	Eigenvalue	Difference	Proportion	Cumulative
Frequency of feedback from leaders	2.12968	1.96892	1.1356	1.1356
Satisfaction with use of members' views in decisions	0.16075	0.21182	0.0857	1.2213
Frequency of soliciting members' ideas	−0.05106	0.11	−0.03	1.19
Frequency of including members in external meetings	−0.15965	0.04	−0.09	1.11
Likelihood of getting views considered	−0.20428	.	−0.11	1.00
Cronbach's alpha				0.789
Bartlett test of sphericity (Chi2)				328.243***
Kaiser-Meyer-Olkin (KMO)				0.789

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2. Factor loadings (pattern matrix) and unique variances.

Indicator	Factor1	Uniqueness
Frequency of feedback from leaders	0.622	0.6131
Satisfaction with use of members' views in decisions	0.4325	0.8129
Frequency of soliciting members' ideas	0.7037	0.5048
Frequency of including members in external meetings	0.7668	0.412
Likelihood of getting views considered	0.6874	0.5274

interest, future studies could include multiple municipalities to widen the population and, hence, the sample size. Nonetheless, the findings from this study provide relevant insights for promoting group inclusiveness for inclusive climate adaptation among local groups that are involved in participatory climate adaptation initiatives in similar contexts, especially in the global south.

Using purposive sampling at the initial stage of the sampling process resulted in the possibility of overlooking some potential members of fishers' and farmers' groups in the municipality who could not be sampled due to the final selection of respondents from active groups only. This invariably narrowed the sampling frame and resulted in (i) a reduced sample size and (ii) a sample that is not entirely randomized. Consequently, a relatively small sample that is not fully randomized could reduce the generalizability of the findings to the larger community. However, by employing purposive sampling at the initial stage, we enhanced the rigor and trust reliability of the study and its outcomes. Sampling purposively ensured the respondents in the sample matched the research objectives, as they had relevant experiences to report.

Results

Based on the survey data, this section presents the findings about how group inclusiveness of farmers' and fishers' groups shapes their members' and leaders' actual and willingness to participate in their group's activities. We also present how other control variables like leadership status, years of membership, gender, educational status, and age are associated with actual participation and willingness to participate in their group's activities. At the local level, an

individual's decision to participate in climate adaptation decision making is influenced by their group's inclusiveness. The results of the regression analysis on the link between group inclusiveness and participation are reported in Table 3. The result for actual group participation is reported in column 1. Willingness to participate based on effort and feeling of encouragement are also presented in columns 2 and 3, respectively.

Looking at the coefficient of determination, we see in column 1 that 36.9% of the variation in group participation is explained by the model, which contains the inclusiveness scale and other covariates. In columns 2 and 3, we observe that 21.9% and 41.8% of the changes in participation based on effort and participation based on feeling of encouragement can respectively be attributed to changes in the inclusiveness scale and other covariates. We test for multicollinearity among our explanatory variables using the variance inflation factor (VIF). The VIF value of 1.26, which falls considerably below the threshold of 10, shows that the explanatory variables in the model have a considerably low correlation between them. Since the correlation between the explanatory variables is low, the model fits overall (Craney & Surles, 2002), and the estimates are not biased. The VIF of 1.26 is also well below the highest conservative upper limit of 2.5 (Tinel et al., 2020). The low correlation between the explanatory variables is supported by the pairwise correlation matrix presented in Table A2. We see from Table A2 that the highest correlation is between education and age, which is expected because years of schooling is highly correlated with age. The inclusiveness variable also has a considerably low correlation with the other control variables, with the lowest being 1.1% (female) and the highest being 17% (years of membership).

In column 1, we see that a unit increase in inclusiveness is associated with a 0.437 increase in times participated. In column 2, we observe that a unit increase in inclusiveness is associated with a 0.405 increase in a member's willingness to make an effort to participate in their group's climate adaptation planning. As shown in column 3, a unit increase in inclusiveness is associated with a 0.826 increase in a member's feeling of encouragement to participate in their group's design of climate adaptation plans. Overall, an individual's participation in their group's climate adaptation decision making increases with their group's inclusiveness.

This supports our first hypothesis (H1), which stated that 'Group inclusiveness is positively associated with an individual's participation in their group's climate adaptation decision making'. Our finding provides strong empirical justification in support of studies that have anecdotally called for the promotion of group inclusiveness as a means of driving local participation in civic activities like climate adaptation decision-making (Buggy & McNamara, 2016; Takao, 2012). Unlike previous studies, we achieved this by introducing the novel CoP-BIS construct to inform our empirical exposition.

The results for the control variables also provide interesting insights worth discussing. The more years an individual spends with a group, the more the person is willing to participate. The positive association between years of membership and actual participation is 0.269 and is significant at the one

Table 3. Group inclusiveness and local participation in climate adaptation decision making.

Variables	(1) Actual Times participated	(2) Willingness to Participate Effort	(3) Feeling encouraged
Inclusiveness scale	0.437*** (0.061)	0.405*** (0.074)	0.826*** (0.092)
Leader (0 = No; 1 = Yes)	0.170 (0.189)	0.530*** (0.140)	0.136 (0.135)
Years of membership	0.269*** (0.040)	−0.012 (0.049)	0.066 (0.053)
Female (0 = male; 1 = female)	0.051 (0.118)	0.172 (0.145)	−0.001 (0.143)
Educational status (Base = No education)			
Basic	−0.004 (0.115)	0.101 (0.144)	0.259* (0.144)
Secondary	−0.086 (0.243)	0.516** (0.261)	0.459 (0.293)
Tertiary	0.403 (0.275)	0.348 (0.254)	0.619* (0.317)
Age (0 = young; 1 = old)	−0.045 (0.143)	0.382** (0.193)	0.096 (0.209)
Constant	2.115*** (0.207)	3.568*** (0.267)	3.511*** (0.308)
Observations	224	224	224
R-squared	0.369	0.219	0.418
F(8, 215)	22.53***	7.08***	13.64***
Multicollinearity (VIF)	1.26	1.26	1.26

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

percent alpha level. This means that individuals with more years of membership in their groups are very likely to be the ones who participate the most in their group's decision making. It also suggests that individuals with fewer years of membership in their groups are less likely to participate in their group's activities when leadership status, gender, education status, and age are controlled for. The positive association between longevity of group membership and participation in climate adaptation decision-making is consistent with those posited by Koomson (2023b).

In column 2, we see that leaders are 0.530 more willing to make an effort to participate in their group's decisions on climate adaptation, which is significant at the one percent alpha level and aligns with the finding of Shore and Chung (2022). Leadership has the expected positive relationship with both actual participation and feelings of encouragement to participate, but these are not statistically significant. This is expected because a leader's actual participation is associated with the individual's role. The propensity of actual participation based on role also overrules any feeling of encouragement, thereby rendering it insignificant.

Females are more willing to participate in their groups' decision making on climate adaptation than males, but this association is also not significant. In other words, gender does not make a statistically significant difference in determining an individual's *actual* participation and *willingness* to participate. This holds when the other variables of interest are controlled for. Therefore, even though the analysis did not show a statistically significant difference between males' and females' willingness to participate, the suggestion in the results that females are more likely to participate in adaptation decision making is worth noting.

Overall, education status plays a role in an individual's willingness to participate but does not influence their actual participation. Those educated up to the basic level (elementary and junior high school) have 0.259 more feeling of encouragement to participate compared to their counterparts who have no formal education ($p < 0.1$) when other predictors of interest are controlled for. Respondents educated up to the secondary (high school) level are 0.516 more willing to put in an effort to participate compared to their counterparts who have no formal education ($p < 0.05$), controlling for all other factors of interest. Also, individuals educated up to the tertiary level have a 0.619 high feeling of encouragement to participate compared to their counterparts who have no formal education ($p < 0.1$), holding other controlled variables constant. The overall positive link between education and willingness to participate in climate adaptation decision-making is supported by findings in the extant literature, which have shown that highly educated people are more likely to lead their groups (Hsieh & Winslow, 2006) and are also more inclined to be involved when participatory initiatives allow random self-selection of participants (Fung, 2006).

Age also plays a role in the efforts individuals make to participate. Older people are 0.382 more willing to make an effort to participate in their group's climate adaptation decision making, which is significant at the five percent alpha level. This finding aligns with the assertion of Slade Shantz et al. (2020) and Koomson (2023b) that prevalent age-based

authority manifests in public activities in a hierarchical and collectivist society like Ghana, where elders tend to bear the responsibility and privilege of making decisions and speaking for their groups.

Robustness check

To ensure consistency in our findings, we engage in two robustness. First, we use the equally weighted average group inclusiveness scale as an alternative measure, analyze it along with the actual participation and willingness to participate variables and report the results in Panel A of Table 4. These regression analyses also contain all the control variables, but we report estimates for the group inclusiveness scale since it is our variable of focus. As shown in column 1, a unit increase in inclusiveness is associated with a 0.375 increase in times participated. In columns 2 and 3, we observe that a unit increase in inclusiveness is associated with a 0.472 increase in a member's willingness to make an effort to participate in their group's climate adaptation planning and a 1.116 increase in a member's feeling of encouragement to participate in their group's design of climate adaptation plans. These findings imply that the positive association between group inclusiveness and members' actual participation and willingness to participate are consistently established irrespective of the method used in producing the group inclusiveness scale.

Second, we use ordered logit to estimate the models since responses to the outcome variables have an inherent ranking structure. The results are reported in Panel B. In column 1, we see that inclusiveness is associated with a 1.139 increase in times participated. The results in columns 2 and 3 show that inclusiveness is associated with a 0.936 increase in a

Table 4. Group inclusiveness and local participation in climate adaptation decision making (alternative measure & method).

Variables	(1) Actual Times participated	(2) Willingness to Participate Effort	(3) Feeling encouraged
Panel A: Alternative measure			
Inclusiveness score (average)	0.375*** (0.087)	0.472*** (0.104)	1.116*** (0.118)
All control variables	Yes	Yes	Yes
Observations	224	224	224
R-squared	0.264	0.180	0.393
F(8, 215)	13.36***	6.56***	16.09***
Multicollinearity (VIF)	1.25	1.25	1.25
Panel B: Alternative model (ordered logit)			
Inclusiveness scale	1.139*** (0.204)	0.936*** (0.172)	1.697*** (1.000)
All control variables	Yes	Yes	Yes
Observations	224	224	224
Pseudo R-squared	0.183	0.111	0.183
Wald chi2(8)	84.72***	41.39***	68.14***
Multicollinearity (VIF)	1.25	1.25	1.25
/cut1	-2.571	-2.642	-2.949
/cut2	1.387	-1.764	-1.970
/cut3	2.847	-0.744	-0.104
/cut4		1.877	1.253

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

member's willingness to efforts to participate and a 1.697 increase in a member's feeling of encouragement to participate in their group's design of climate adaptation plans. The findings from the ordered logit model are consistent with those produced from the OLS estimator. This implies that the positive relationship between group inclusiveness and members' actual participation and willingness to participate are consistently established, irrespective of the estimation strategy employed.

Discussion and implications

This study responds to the enduring call to address the practical challenges around how to sustainably take local participation in climate adaptation decision making from 'community' participation to inclusive local participation (See Buggy & McNamara, 2016; Chu, 2018; Eriksen et al., 2015; Koomson, 2024; Lioubimtseva, 2022; Munaretto et al., 2014). Thus, the study focused on how group inclusiveness and individuals' social group identity shape their participation in adaptation decision making. The findings demonstrate that group inclusiveness improves various social groups' participation—from feeling encouraged to participate, willingness to make efforts to participate, and actual participation.

The findings indicate that group inclusiveness is a critical driver of local individuals' participation in climate adaptation decision making. Group inclusiveness is a statistically significant predictor of all three dimensions of participation—*reported actual number of times participated*, *willingness to make efforts to participate*, and *feeling encouraged to participate*—at the 1% alpha level when socio-demographic attributes that can influence participation are controlled for. All three dimensions of participation increased respondents' participation in adaptation decision making when group inclusiveness increased. This finding is consistent with the outcomes of previous works that suggest that inclusiveness is an important driver of participation in group activities in other contexts (DeWall et al., 2011; Jansen et al., 2014, 2020). However, it is worth noting that group inclusiveness in this study refers to the objective measure of a group's inclusive communicative practices as observed by members, unlike the other studies that were based on group members' emotive and subjective perceptions of group inclusiveness (see e.g., Jansen et al., 2014, 2020; Nelson & Piatak, 2021; Shore & Chung, 2022).

Despite this difference, the consistency in the findings based on the two types of measurements of inclusiveness confirms the view that inclusiveness makes people feel valued, which improves their sense of belonging and thus inspires their commitment and contributions to their group (see DeWall et al., 2011; Jansen et al., 2014). This reinforces the need for local groups involved in climate adaptation initiatives to embrace inclusiveness through inclusive communicative practices. This could help to improve the inclusionary cues the groups send to members and thus enhance their members' sense of belonging, especially for marginalized social groups like women. This way, communities can reap the benefits of diversity in the views and perspectives that inform climate adaptation planning and implementation.

The CoP-BIS proved to be a robust measure of group inclusiveness. Its five indicators of inclusiveness—frequency of feedback from leaders, satisfaction with the use of members' views in decisions, frequency of soliciting members' ideas, frequency of including members in external meetings, and the likelihood of getting views considered—demonstrated internal consistency. With 0.789 Cronbach's alpha for the five indicators, the scale has internal reliability and is relevant for measuring group inclusiveness based on people's actual experiences of communicative practices within social groups. Based on respondents' reported experience with how their groups engage their members, this scale is a valuable measure of actual group inclusiveness. The analyses show how an inclusive culture that allows for effective two-way communication (feedback provision and solicitation of members' input) and actions like involving members in activities that matter can enhance group inclusiveness.

Given that other factors apart from group inclusiveness can also influence participation and that both inclusiveness and participation are social phenomena, the study also examined how factors such as leadership status, years of membership, gender, educational status, and age influenced participation. The results showed a significantly positive association between years of group membership and actual participation, suggesting that people who have stayed with their groups for a long time feel more included and are more likely to participate. This finding does not only align with Jansen et al.'s (2020) finding that individuals' perceptions of inclusion evolve over time; our finding extends this by showing that individuals' experience of inclusiveness evolves positively over time. A plausible explanation for this may be that some people get to understand their groups better over time and develop skills for coexisting and working with other group members, which improves individuals' and groups' ability to navigate group challenges and opportunities more effectively.

However, this finding that the benefit of time makes people feel more included in their groups is not to be taken to suggest that individuals would naturally feel more included in their groups over time, as some individuals' priorities may not align with their groups' interests (see Jansen et al., 2020). Thus, local groups involved in participatory adaptation initiatives should pursue properly coordinated group engagement to help shorten the 'learning curve' and the time required to make the group more inclusive. Indeed, the regression analysis indicates that the positive influence of group inclusiveness on participation is not dependent on the duration of togetherness. This finding suggests that deliberately working toward group inclusiveness can override the need for time to improve group inclusiveness. In this regard, the finding also evokes the idea that greater responsibility rests on groups (especially leaders) to build inclusiveness rather than rely on individual members' willingness to be included (see DeWall et al., 2011; Ellemers & Jetten, 2013) over time. Thus, a group that aims to improve its members' participation in the group's adaptation decision-making processes must be guided by these insights to work toward group inclusiveness while keeping its members together even in the face of challenges, especially during the early stages of *forming*, *storming*, and *norming*.

As the results indicate, one's leadership status has a statistically significant influence on their willingness to participate in their group's decision making. Also, leadership status positively influences a person's actual participation and makes them feel encouraged to participate, but these are not statistically significant. The need for inclusiveness in local groups becomes even more apparent when we relate our findings to previous findings that suggest that even leaders can feel uninvolved in their groups (Hoogervorst et al., 2012; Nelson & Piatak, 2021), particularly leaders from marginalized social group members like women (e.g. Mor-Barak, 2013; Nelson & Piatak, 2021). This is more so when one considers that leaders who feel socially included sacrifice more of their self-interest for their group's well-being (see Hoogervorst et al., 2012). Leaders who feel included can also be expected to appreciate inclusiveness and promote the interests of people like them (see e.g., Johansen & Zhu, 2017; Mor-Barak, 2013) by providing inclusive and transformative leadership that gives members the psychological safety to share their ideas freely (Edmondson & Lei, 2014).

Also, the results show that females are slightly more willing to participate in their groups' adaptation decision making than males, but this difference is not statistically significant. This finding is, somehow, consistent with insights from previous works that suggest that women are more concerned and desirous of addressing climate change (McCright, 2010; Sundblad et al., 2007). Considering our finding here that there is no significant difference between women's and men's willingness to participate in their groups' adaptation decision making in light of the multiple sociocultural factors and project initiators' operational deficits that limit women's contributions to adaptation planning (P. Koomson, 2023a), it is necessary for local groups and adaptation initiators to employ deliberate strategies that ensure women are adequately involved in adaptation to decision making.

Similarly, our regression analyses indicate that the higher an individual's educational status, the more their willingness to participate, but that does not influence their actual participation. This is partly consistent with the literature that suggests more educated local people often do not actually participate in local development initiatives as desired due to various reasons (see Fung, 2006; Mansuri & Rao, 2013) even though such people tend to be the preferred collaborators for climate adaptation initiators (see Chu, 2018; Lund & Saito-Jensen, 2013). Our finding is interesting in that actual participation is what matters in shaping decision making, not the desire to participate. Thus, if the more educated people do not actually participate in adaptation decision making, then pursuing their participation on the assumption of their superior capacity to make more useful contributions, perhaps, amounts to a wild goose chase.

Finally, the analysis shows that age also plays a statistically significant role in individuals' efforts to participate and that older people are more willing to make an effort to participate in their group's design of climate adaptation plans. This difference may be plausibly explained in terms of changing occupational trends in the study site and other places, with younger people less involved in economic activities like fishing and farming that are more impacted by climate change.

But this observation could also be due to the conditioning effect of Ghana's hierarchical social order that renders young people in the society less involved in decision making (see Schwartz, 2006; Slade Shantz et al., 2020), as the young defer to their 'elders' as the decision makers and spokespersons for the rest of the society (see van der Geest, 1997). In this regard, climate adaptation initiators must consciously address the established age-based authority and other power differences that can manifest in participatory climate adaptation decision making in Ghana and other hierarchical societies to ensure inclusive local participation.

Cognizant of the reality that social groups that have been subjected to exclusion from public decision making for a long time come to internalize their exclusion and would not easily break out of that 'shell' to participate freely (see Mansuri & Rao, 2013), groups must consciously enhance their deliberative virtues by being more attentive, reasonable, temperate, empathetic, and demonstrate dependability to ensure that their members (including women, the less educated, and young people) feel included and encouraged to participate (see Aikin & Clanton, 2010; Ferkany & Whyte, 2011).

Conclusion and limitations

The most outstanding finding in this study is that group inclusiveness is a strong and independent driver of local participation in climate adaptation decision making, even when other relevant factors are taken into account. Additionally, the analyses show that group inclusiveness, in turn, is shaped by groups' communicative practices—ideas solicitation, acknowledgment of views, views utilization, feedback provision, and member involvement. The combined import of these results is that local groups that are involved in participatory climate adaptation would benefit from the diverse insights of their members by adopting and sustaining inclusive communication practices. For participatory climate adaptation to live up to its hype as the panacea for the challenges faced in climate adaptation efforts, local groups as project partners should be encouraged and supported to practice inclusive communication. This is supported by the evidence from the results, which indicate that all three dimensions of group members' participation (feeling encouraged to participate, willingness to make efforts to participate, and actual participation) in decision making are significantly associated with group inclusiveness.

Despite some differences in the extent to which inclusiveness influences various categories of group members' participation, the overall positive effect of inclusiveness on participation holds for all categories of group members, including leaders and regular members, males and females, the young and older members, among others. We further argue that the robustness of CoP-BIS in measuring group inclusiveness objectively with five indicators based on actual communicative practices in groups indicates that the results of the study are reliable. The significant influence of group inclusiveness on participation indicates group inclusiveness can offset other drawbacks of participation if deliberately built into a group's communicative practices, actions, and overall culture.

Hence, developing group inclusiveness is necessary for local groups to achieve their objectives for engaging in participatory climate adaptation. Fostering inclusive local participation among their members would help ensure the design of adaptation measures that serve the pressing needs of communities, especially for the most vulnerable, and thereby promote equity and justice in environmental management at the grassroots level. Although this study is directly linked to the United Nations' Sustainable Development Goal 13 (SDG13), which seeks to 'take urgent action to combat climate change and its impacts', the pursuit of group inclusiveness would enable the attainment of SDG 17—forming partnerships for the goals. The potency of group inclusiveness in shaping the participation of diverse local people, as the results of the analyses show, could be leveraged to foster improved local involvement in efforts to achieve other SDGs like no poverty (SDG 1), zero hunger (SDG 2), clean water and sanitation (SDG 6), gender equality (SDG 5), and others.

Group inclusiveness can facilitate the mobilization of existing and supplementary resources and the building of partnerships among the private sector, civil society, and governments. Also, inclusiveness can help in removing or navigating traditional social barriers around gender, patriarchy, and hierarchy, which suppress the involvement of marginalized groups in decision making.

This study builds on social inclusiveness and participation theories with the argument that nurturing inclusiveness to improve participatory climate adaptation decision-making can lead to more equitable adaptation outcomes while mobilizing the growing interest in climate change as a rallying point for addressing broader social challenges. Climate adaptation initiators should consider making social inclusion a central part of their projects to promote inclusive local participation toward attaining sustainable project outcomes. This would also help empower local people to pursue development and social change in their communities.

Even though the survey sample of 225 was deemed sufficient for the study, the researchers acknowledge that a larger sample could improve the generalizability of the findings, as a larger sample is likely to improve the overall power data analysis and inject more confidence into the interpretation of its outcomes. A larger sample could also enhance the validity of the indicators of inclusiveness that were used to generate the CoP-BIS. Although the items in the CoP-BIS were pretested and assessed for the first time in this study, they proved to be a robust measure of group inclusiveness. Yet, the scale would benefit from further testing. Hence, future studies interested in employing the CoP-BIS should consider using larger samples in different contexts and locations to test the applicability of the CoP-BIS further. Also, the participation variables were measured, using participants' reported participation. This works well for willingness to participate and feeling of encouragement to participate but not so well for actual participation. A more objective measure of actual participation could be based on observed participation or records of attendance and contributions to deliberations from minutes of meetings, but these options were not available for this study, as such records were largely non-existent for the groups that were studied.

Notes

1. There is a link between the concept of *mpanyinfo* and respect in Ghanaian society, particularly in rural communities. In van der Geest's view, 'To be respected is the prerogative of the *opanyin*, the elder ... Respect shows and delineates social categories: those who give respect and those who receive it. The categories are relative and change, depending on the context. Young people respect older ones, women respect men, children their parents ... laymen respect *sacred people*...' (van der Geest, 1997, p. 535).
2. The *ahotor* stove is an energy-efficient and less-smoke emitting technology for fish smoking (Hinneh, 2016).

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No potential conflict of interest was reported by the author(s).

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Appendix

Table A1. Summary statistics.

Variable	Description	Mean	Std. Dev.
Actual participation			
Times participated	Ordered scale of respondent's actual participation in group's activities and meetings	2.955	0.912
Willingness to Participate			
Willingness to make efforts	Five-point scale of respondents' willingness to make efforts to participate in their group's activities and meetings	4.107	0.969
Feeling encouraged	Five-point scale of respondents' feeling of encouragement to participate by contributing ideas to their group's climate change adaptation planning	3.996	1.185
Inclusiveness scale (factor)	Group inclusiveness scale obtained by applying principal factor analysis (PFA) to the five indicators of inclusiveness	0.001	0.888
Inclusiveness scale (average)	Group inclusiveness scale obtained by generating an average/mean score from the five indicators of inclusiveness	5.154	0.628
Leader (0 = No; 1 = Yes)	=1 if respondent is the leader of the group	0.107	0.310
Years of membership	Reported number of years of group membership	3.049	1.168
Female (0 = male; 1 = female)	=1 if respondent is female	0.665	0.473
Education Status			
No education	= 1 if respondent's highest educational level achieved is 'none'	0.353	0.479
Basic	= 1 if respondent's highest educational level achieved is basic	0.540	0.499
Secondary	= 1 if respondent's highest educational level achieved is secondary	0.076	0.265
Tertiary	= 1 if respondent's highest educational level achieved is tertiary	0.031	0.174
Age (0 = young; 1 = old)	= 1 if respondent is considered an older person (ages 41 years or more)	0.790	0.408

Table A2. Correlation matrix among variables used in the analysis.

	Actual Times Participated	Effort	Feeling Encouraged	Inclusiveness Scale	Leader	Years of Membership	Female	Education	Age
Times Participated	1.000								
Effort	0.142 (0.033)	1.000							
Feeling Encouraged	0.373 (0.000)	0.455 (0.000)	1.000						
Inclusiveness scale	0.494 (0.000)	0.402 (0.000)	0.629 (0.000)	1.000					
Leader	0.128 (0.055)	0.199 (0.003)	0.122 (0.068)	0.095 (0.154)	1.000				
Years of Membership	0.415 (0.000)	0.082 (0.218)	0.164 (0.014)	0.171 (0.010)	0.099 (0.139)	1.000			
Female	0.007 (0.920)	0.049 (0.463)	-0.051 (0.450)	0.011 (0.876)	-0.182 (0.006)	0.006 (0.934)	1.000		
education	-0.015 (0.824)	0.003 (0.966)	0.074 (0.270)	-0.072 (0.284)	0.146 (0.029)	-0.053 (0.425)	-0.426 (0.000)	1.000	
Age	0.095 (0.155)	0.184 (0.006)	0.083 (0.213)	0.167 (0.012)	0.001 (0.994)	0.148 (0.026)	0.262 (0.000)	-0.479 (0.000)	1.000