

RESEARCH OUTPUTS / RÉSULTATS DE RECHERCHE

Capturing multiple social perspectives on adaptation across scales

Dujardin, S.; Orban-Ferauge, F.; Cañares, M. P.; Dendoncker, N.

Published in:
Climate and Development

DOI:
<http://dx.doi.org/10.1080/17565529.2017.1301863>

Publication date:
2018

Document Version
Version created as part of publication process; publisher's layout; not normally made publicly available

[Link to publication](#)

Citation for published version (HARVARD):
Dujardin, S, Orban-Ferauge, F, Cañares, MP & Dendoncker, N 2018, 'Capturing multiple social perspectives on adaptation across scales: a Q-method analysis of actors from development planning in the Philippines', *Climate and Development*, vol. 10, no. 5, pp. 458-470. <https://doi.org/10.1080/17565529.2017.1301863>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

climate and
development

**Capturing multiple social perspectives on adaptation across
scales: A Q-method analysis of actors from development
planning in the Philippines**

Journal:	<i>Climate and Development</i>
Manuscript ID	15-CDEV708-RA.R3
Manuscript Type:	Research Article
Keywords:	Adaptation, Development, Participation, Urban Development, Southeast Asia

SCHOLARONE™
Manuscripts

View Only

1
2
3 **Capturing multiple social perspectives on adaptation across scales:**
4 **A Q-method analysis of actors from development planning in the Philippines**
5
6
7

8 ***Abstract***
9

10
11 This paper describes and analyses viewpoints regarding climate change adaptation held among
12 key social actors from the field of development planning in the Philippines. Four empirically
13 significant social perspectives are determined – institutional, grassroots, developmental and
14 physical planning – using Q-method, an intensive qualitative and quantitative technique. Major
15 differences and commonalities between perspectives are highlighted, in addition to actors'
16 arguments used to justify claims. Drawing upon an actor-oriented approach, results contribute
17 filling a knowledge gap in the literature on the need to develop approaches that can guide
18 adaptation thinking in development planning. While the four perspectives identified provide
19 evidence that differentiated viewpoints on climate change and planning practices may lead to
20 divergent adaptation strategies, commonalities among social perspectives suggest that shared
21 adaptations may also emerge both among actors from multiple organizational structures and
22 across the organisational hierarchy of planning. By building learning processes that include
23 multiple social perspectives across scales, development planning can become a promising
24 candidate for strengthening adaptive capacities and delivering more effective responses to
25 climate change.
26
27
28

29
30 **Key words:** Climate change adaptation, development planning, social perspectives, Q-method,
31 Philippines, Bohol.
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1. Introduction

Concerns about the nature, pace and implications of climate change have been the subject of scientific debates for many years. Recently, the inclusion of a broad range of actors is frequently promoted in policy responses to climate change. References to 'participation', 'stakeholder engagement', 'bottom-up' processes, and other terms associated with a discourse of inclusive governance are widespread (Few, Brown, & Tompkins, 2007). In this regard, the Intergovernmental Panel on Climate Change (IPCC) claims with "high confidence" (Yohe et al., 2007, p.813) that participatory processes can reduce vulnerability to the hazards associated with current and future climate variability and extremes. Such a call for inclusive governance has been echoed within the fields of planning and development where inclusive practices are often promoted for fundamentally reinforcing key aspects of adaptation.

Understood as the link between knowledge and action (Friedmann, 1987), development planning can help foreseeing and guiding change by undertaking actions to reduce the risks and capitalize on the opportunities associated with global climate change (Füssel, 2007; Hall, 1982; Potter, 1985; Pugh & Potter, 2003). Interdisciplinary, multi-scale, stressing the physical, yet inescapably social, it can also support the inclusion of multiple actors within planning processes in order to incorporate a knowledge base tailored to local places within adaptation plans (Blanco et al., 2009). Besides, implementing multiple actor processes within planning mechanisms for initiating structural measures creates the potential for more effective risk reduction whilst building capacity, enhancing governance and accountability, and increasing ownership and more sustainable outcomes (Cutter et al., 2012).

Nonetheless, planning theories and development frameworks are often poorly articulated around the challenge of adaptation to climate change, highlighting the need to develop approaches that can guide adaptation thinking in development planning practice (Hedger, Moench, Dixit, Kaur, & Anderson, 2011). Meanwhile, experience in the field of adaptation research shows the increasing importance to recognise the complexities inherent in efforts to engage multiple actors for building adaptive capacity (Engle & Lemos, 2010; Huntjens et al., 2012; Inderberg, Eriksen, O'Brien, & Sygna, 2014). Consequently, this research investigates how to guide adaptation thinking in development planning by building upon a framework that encompasses two key components.

First, climate change is a challenge that cannot be addressed solely by a single level of individual or organisational actor. Although local community actors for instance are critical for action and essential elements for local adaptation, adaptive capacities are not created in a vacuum. Local-level institutions often provide the enabling environment for adaptation planning and implementation (Cutter et al., 2012). Adaptation thus requires 'multi-level' or 'multiscale' governance (Bulkeley & Betsill, 2005; Leck & Simon, 2013), which involves organisations and institutions from both the government and non-government sectors. Likewise, responding to the novel hazards of climate change requires social learning systems enable to take decisions at an appropriate level in the organisational hierarchy (Cash & Moser, 2000).

Second, building successful adaptations requires the capacity to combine various social perspectives. As Pelling (2011) pointed, it is clear that multiple actors will have viewpoints on what to protect, enhance or expend through adaptive actions and these may not be easily

resolved. Hence, capturing various perspectives of multiple actors holding different viewpoints is pivotal in mutually achieving short-term and long-term adaptation needs to climate change (Bardsley & Sweeney, 2010; Corfee-Morlot, Cochran, Hallegatte, & Teasdale, 2011; K. O'Brien & Selboe, 2015; Shaw et al., 2009). As O'Brien (2009) argues, the challenge is to identify adaptation strategies that acknowledge and address a spectrum of values and viewpoints. In contrast to systems that can be objectively measured and observed, these "subjectively influence the adaptations that are considered desirable and thus prioritised" (O'Brien, K., 2009, p.164).

Building upon this framework, this paper investigates the potential role of development planning for strengthening adaptive capacities. In particular, it explores how development planning can create learning processes that incorporate various social perspectives and facilitate developing a common understanding critical for multiscale and multiple actors' actions. An actor-oriented approach focusing on state and non-state actors is undertaken by accounting for government and civil society organisations (CSOs) involved in both planned and autonomous adaptation strategies¹. Such an approach recognizes multiple simultaneous adaptations, but also betrays a critical issue, i.e. the potential mismatch between adaptation efforts of planned and autonomous activities. This kind of interaction has been recognised between two types of actors, such as when community adaptations are undermined by local government actions (Adger, Arnell, & Tompkins, 2005; Bulkeley & Betsill, 2005). Yet, poor evidence exists as to how actors engaged in those two forms of adaptation strategies may hold conflicting viewpoints on adaptation (Engle & Lemos, 2010; Hedger et al., 2011; Huntjens et al., 2012).

The aim of this study is thus two-fold: (i) to capture multiple social perspectives on climate change adaptation and planning practices across the organisational hierarchy of planning, and (ii) to examine whether commonalities and differences among these perspectives may lead towards divergent or convergent adaptation strategies. Within the next sections, we first introduce the adaptation and development planning context of our case study, the Philippines. Then, we implement the Q-method, an intensive qualitative and quantitative technique for examining and characterizing multiple actors' viewpoints. Lastly, we detail four social perspectives and further discuss their commonalities and differences.

2. Study area

Climate change poses a unique set of challenges to archipelagic countries such as the Philippines. Due to its geography, the country is one of the top most disaster prone countries in the world facing climate-induced hazards such as tropical cyclones, droughts, landslides, and floods (Birkmann et al., 2011). Yet, climate change is exacerbating these hazards, which are likely to increase as climate projections foresee an increase in the frequency and severity of those events (Van Aalst, 2006). Global warming and sea level rise also potentially affect settlement patterns, agricultural systems, fishing practices and other livelihood pursuits in various ways (Capili, Ibay, & Villarin, 2005; Rincón & Virtucio, 2008). In this context, the Philippines needs to address climate-related risks because of its exposure and relative vulnerability, but also because it needs to further develop its adaptive capacity (AKP, 2012). The country's existing

¹ Planned adaptation is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state. By contrast, autonomous adaptation is a response to experienced climate and its effects, without planning explicitly or consciously focused on addressing climate change (Agard et al., 2014).

89 adaptive capacity is drawn upon pre-existent disaster risk reduction and management (DRRM)
90 activities, but has now to be enhanced where possible, avoiding to start from scratch and
91 duplicating current initiatives (IDS, 2010).

92
93 This study focuses on the island province of Bohol in the central Visayas region (see Figure 1).
94 Referred in the country as being at the forefront of local governance (Cañares, 2014), the
95 province of Bohol has a great potential for building adaptation strategies resulting from the
96 interactions between different levels of social actors and institutions. There are numerous climate
97 change adaptation strategies undertaken by various types of actors depending on their focus
98 areas (see IDS, 2010). Among the most active in the field of development planning are
99 government agencies and civil society organisations.

100
101 On the government side, Local Government Units (LGUs)² in Bohol are mainly involved in
102 planned adaptation strategies through current efforts of mainstreaming climate change adaption
103 into development planning at all levels of governance, as required by the Climate Change Act.
104 Being a pilot province for the project named “Integrating Disaster Risk Reduction and Climate
105 Change Adaptation in Local Planning and Decision-making Processes”, LGUs from Bohol are
106 additionally solicited to address the challenge of climate change in local development planning.
107 By law, *barangays* (i.e. the smallest political administrative division) should identify issues, best
108 practices and implement solutions, while the municipal and city governments are mandated to
109 consider adaptation as one of their regular functions. The provincial governments in turn shall
110 provide technical assistance, enforcement, and information management support to
111 municipalities and cities (AKP, 2012).

112
113 CSOs in Bohol, on the other side, are mostly involved in autonomous adaptation by developing
114 strategies not explicitly related to climate change, but aimed at reducing vulnerability and
115 enhancing overall adaptive capacity of individuals and communities in areas of high climate
116 impacts. In this regard, the most active NGOs on the island are committed to address pressing
117 socio-economic and environmental issues by strengthening and capacitating local communities
118 and development organisations such as People’s Organizations (PO) and cooperatives (e.g.
119 farmers, fishers, and women). These kind of autonomous actions can improve the overall
120 adaptive capacity of households without necessarily targeting a particular climatic stressor or
121 addressing a climate extreme event.

122
123 However, an integrated strategy linking the national, planned and local, autonomous
124 development practices still has to be built both within and in-between civil society forces and the
125 government at various levels. Resurreccion et al. (2008) for instance pointed a mismatch
126 between national level discussions with broad-scale scoping, and local level realities in
127 adaptation where macro scale analysis of climate change are unresponsive to local needs and
128 realities for adaptation. Within the next section, such a disjunction between planned and
129 autonomous forms of adaptation is addressed by comparing actors’ viewpoints from the field of
130 development planning in the Philippines.

131
132 Fig. 1. Study area and survey sites

² A LGU in the Filipino context may be a province, a city, a municipality, or a *barangay* in the descending order of geographical scale and scope of political power. In geographical terms, each LGU has its own territorial jurisdiction but the smaller unit is embedded in the next higher unit forming a nested pattern (DILG, 2008).

133

3. Method and data

This study relies on Q-method (Brown, 1980; Stephenson, 1935) to understand and describe the variety of subjective viewpoints regarding climate change adaptation held among actors from government agencies and civil society organisations in the Philippines. Used as “a powerful tool for anti-essentialist approaches to subjectivity and for constructivist inquiries” (Robbins & Krueger, 2000, p.636), it provides a methodological framework for a systematic, multi-scalar examination of social perspectives across the scales of the organisational hierarchy of planning. Most typically in Q, a person is presented with a set of subjective statements about some topic, and is asked to rank-order them. Based upon this sorting exercise called ‘Q-sort’, factor analysis is processed to identify patterns in individuals’ Q-sorts. What factor analysis does is to mathematically create a few new variables that explain variation in many variables. In a Q-method survey the variables are the Q-sorts where the factor analysis attempts to bring the complexity of multiple individuals’ Q-sorts down to a simpler picture. Once the factor is described in the language of the Q statements, it becomes the product of the Q-method survey. The individuals’ Q-sorts are individual viewpoints, but the factor analysis solutions reflect “deeper organizing principles” (Stephenson 1965) called social perspectives for the purpose of this paper.

The Q-method was implemented according to four main steps. First, a concourse of 40 statements was elaborated. The concourse builds upon our main research question by translating subjective ways of perceiving climate change and strengthening adaptive capacities. It aims at bringing controversial viewpoints to the fore on climate change adaptation and planning practices in the Philippines. Statements are a matter of opinion and drew upon the scientific literature, key reports and documents (e.g. the 1st Bohol Climate Change Summit 2010), and interviews with key informants (i.e. experts from the academia and research institutes, provincial and municipal government officers from planning, environment and governance offices, and active leaders of local NGOs). Three main areas of enquiry were identified: climate change perception, adaptation approach, and planning practices (see Table 3). As statements were submitted to respondents with a wide range of backgrounds, these were translated in Visayan for increasing readability with respondents feeling less comfortable with English.

During the second step, respondents were identified using purposive, non-random sampling to sort the statements on a scale from -3 to +3 according to their degree of (dis)agreement. When sorting statements, the internal frame of reference of each respondent is embedded in their responses. The Q-method thus fully engages with the respondent's own logic and their personal experiences. Q methodologically does not ascribe any *a priori* meaning to the statements in question. Meanings are created during the process of responses, which contrasts with R methods in which both variables and tests in question are constructed by the researcher's frame of reference (McKeown & Thomas, 1988).

The methodology was implemented with a purposeful sample of 37 respondents from government agencies and civil society organisations during August and September 2013 (Table 1). Main respondents surveyed were from both the fields of planning and development in the province of Bohol. Complementarily, associated respondents from higher levels of the planning hierarchy were considered at the regional and national levels for their involvement in

179 mainstreaming climate change adaptation into local development planning. Q-sorts were
180 administered under the condition of an unconstrained sort, i.e. no particular statistical distribution
181 was forced on the rating of statements (Barry & Proops, 1999; McKeown & Thomas, 1988).
182 During the sorting exercise, subsidiary open questions were asked in order to discuss
183 respondents' choices. Q-sorts lasted 43 minutes on average.

184

185 Table 1.

186

187 The third step involved the sequential application of three sets of statistical procedures, i.e.:
188 correlation, factor or principal component (PCA) analysis, and the computation of factor scores
189 (see Robbins, 2005; Zabala, 2014). Following the Q-method, a PCA analysis was carried out on
190 a data matrix with the 37 Q-sorts as variables (columns) and all statements as sample elements
191 (rows) with the aim to group respondents on the basis of the degree of commonality of their
192 viewpoints on statements. Then, factors were extracted by retaining those with both theoretical
193 and statistical significance in order to perform the Q-method reflexively with "full awareness of its
194 interpretive dimensions and not as a number-crunching exercise" (Eden, Donaldson, & Walker,
195 2005, p.421). To achieve this, Brown (1980's) criteria which retains factors containing at least two
196 loadings in excess of the 0,01 or 0,05 level of significance was used. Besides, a Promax rotation
197 (see Abdi, 2003) was performed on the Q matrix in order to facilitate data interpretability

198

199 Fourth, factors were interpreted as social perspectives by selecting defining Q-sorts or "like-
200 minded individuals" (Pini, Previte, & Haslam-McKenzie, 2007, p.8) loading significantly on the
201 same factor³.

202 Factors are "attitudes of mind" (Stephenson, 1965, p.281) held in common by several
203 respondents. In order to inform their interpretation, coded interview transcripts were essential in
204 eliciting the rationale of respondents' viewpoint. In total, 27h27 minutes of audio records were
205 transcribed and an average number of 32 comments per statement were extracted for
206 interpretation.

207

208 Implementing the Q-method is of particular interest for capturing actors' viewpoints on climate
209 change adaptation as it allows going beyond methodological individualism, i.e. the view that
210 social events must be explained by reducing them to individual actions, and accounting for the
211 post-structuralist assumption that meaning and action in development planning are made of
212 systemic relations between individuals and underlying structures (Murdoch, 2006). The power of
213 the Q-method lies in the determination of social perspectives reflecting a totality or *gestalt* that is
214 greater than the sum of the part. As Brown (1980, p.14) explains, one of the core features of the
215 Q factor analysis is that "it is more gestaltist and wholistic, rather than analytic and atomistic, and
216 reflects functional relatedness", meaning that individual's viewpoint is captured in accordance
217 with its relation to the whole context of which it is a part. In other words, the method overcomes
218 the distinction between apparent forms of reality from respondents' speech and essential
219 underlying, constitutive structures and relations between these and their organizations for
220 instance. In the next section, we detail the results obtained after implementing this four-step
221 analysis.

222

223

224

225

226

227

228

229

230

231

³ 'Defining sorts' were identified in this study according to two conditions: (i) the 5% level of significance, and (ii) the condition that the factor explains more than half of the common variance.

4. Results

Four social perspectives could be extracted from the dataset drawing upon experience in the field, a careful statistical examination of data, and interview transcripts. The PCA yielded four factors accounting respectively for 18,5%, 14,0%, 13,6%, 8,2% of the explained variance. In total, 8 out of 37 participants have significant loadings on factor 1, 8 on factor 2, 9 on factor 3 and 3 on factor 4 (see Table 2). Factors are all positively correlated suggesting a convergence of respondent's viewpoints on the concourse of statements. As a result, the four factors extracted represent social perspectives that are divergent but not opposite to each other. Two factors, F1 and F3, have the strongest correlation (0,798), while F2 and F4 are the most weakly correlated (0,331). In Q-method, this further suggests that respondents defining F1 and F3 share closer viewpoints, while F2 and F4 tend to present more differentiated ones.

Table 2 presents the factors in which the entries in the table are called factor loadings. The latter represent the extent to which a respondent is associated with a particular factor. As Table 2 shows, the highest significant factor loading of F1 (0,876) belongs to a Provincial planning and development officer (Q01) and thus contributes the most to characterize the first social perspective associated with F1, named "the institutional perspective". Most defining sorts on this factor are provincial, regional and national officers from government agencies. Their structural position within the organisational hierarchy of planning allows providing plausible explanations for attitudes of mind held in common. However, not all government officers load highest on F1, and two Q-sorts from NGO representatives loaded significantly on this factor (Q06 and Q08).

Table 2

Table 3 presents per factor the weighted scores for each statement. These scores are calculated and normalized as factor scores (abbreviated 'z-scores'). They are subsequently converted into rank statement scores for ease of interpretation, i.e. factor scores are expressed in terms of the original Q frequency distribution of (-3, -2, -1, 0, 1, 2, 3). The array of factor scores show the best model for the perspective and represent a summary of "significantly different assemblages of claims" (Robbins & Krueger, 2000, p.639). Likewise, each perspective represents a coherent pattern of opinion about climate change, adaptation, and planning practices in the Philippines. Within the next sections, the four social perspectives identified are empirically determined by describing the factor in the language of the Q-statements and the arguments used by respondents to justify their claims.

Table 3

4.1. *The institutional perspective*

F1 represents an institutional perspective that supports planned adaptation by highly valuing a strong role of government institutions, including through the mainstreaming climate change adaptation into local development planning.

Several significantly different statements characterize the institutional perspective, the most prominent of which pertains to the role of governments compared to NGOs for building adaptive capacity. A legitimization of government's role is expressed in the negative ranking of statement

269 20 (see S20 in Table 3, $z=-1,07$). In this perspective, NGOs are seen as lacking resources for
270 initiating and sustaining capacity building initiatives. When considering the elaboration of climate
271 change adaptation plans, a climate change officer (see Q02 in Table 2, $F1=0,844$) for instance
272 explains that NGOs need the technical expertise from governments which are the “data
273 producer” of climate change knowledge.

274
275 Besides, such a pro-government perspective is supported by the idea that governments can
276 better implement and sustain lasting changes over society than NGOs. This is supported by
277 several assertions arguing that governments are the regulatory bodies with authority on people
278 over the long run because “governments have the power” (Q01) and “make people abide with the
279 laws” (Q03).

280
281 The institutional perspective is then further expressed in the negative ranking of statement 2
282 which claims that one cannot go against nature. Respondents who load highly on F1 strongly
283 believe something can be done about climate change in such a way that “once you are prepared
284 you are less likely to be affected” (Q07). In this regard, it emphasizes the potential role of
285 mitigation measures to lessen the negative impacts of disasters. In particular, the institutional
286 perspective advocates for a greater mainstreaming of climate change adaptation at the local level
287 through the involvement of both LGUs and individuals, as well as more pro-activity in order to
288 minimize hazard damages (S19, S23, S27).

289
290 Furthermore, the institutional perspective distinctively rejects the idea that climate change is only
291 a threat (S12). Contrary to all three other factors, this perspective considers that benefits exist.
292 One provincial environment officer (Q07) exemplifies the negative score given to this claim telling
293 that climate change is positive for agriculture in the Bohol province, especially rice crops
294 production. Increasing rainfalls may offer the opportunity for farmers to plant four times a year
295 instead of two traditionally, which becomes particularly true for rain fed paddies. In addition, F1
296 loaders consider that climate change can also induce a change in perceptions and attitudes
297 regarding the environment. Taking the example of plastics segregation (instead of dumping or
298 burning), an environmental NGO representative (Q08) further explains that climate change is
299 changing how people do things, their perspectives, attitudes and values regarding the
300 environment.

301

302 *4.2. The grassroots perspective*

303

304 F2 is a grassroots perspective that supports autonomous adaptation by highly valuing the
305 environment and the need for meeting basic needs. It values a reactive, self-reliant attitude
306 towards disaster risks. This factor is built by three representatives of PO, three NGO workers
307 (two from environmental NGOs, and one from a social development NGO), and two government
308 officers from the municipal and provincial level.

309

310 A major component of the grassroots perspective is a strong concern for the environment, which
311 is evident in the high ranking of statement 3 stating that ‘Mother Nature’ should be protected for
312 preventing devastating calamities. Along with this environmentalist stance, the grassroots
313 perspective is characterized by a strong agreement regarding the idea that one cannot go
314 against nature (S02). A PO representative (Q11) justifies a high score by claiming that “Nature
315 cannot be hold” and will always have the last say. In the case of typhoon for instance,

1
2
3 316 respondents often refer to the strength of the meteorological event, as well as the random
4 317 character of its path.

5 318

6 319 In the light of climate change perception, F2 loaders claim observing coastal erosion due to
7 320 strong winds, heavy rain, or soil extraction (S06). However, none blame climate change or
8 321 explicitly voice a relationship between those two phenomena. Meanwhile, the strong agreement
9 322 regarding the statistically significantly statement 17 emphasizes a close association between
10 323 climate change adaptation and DRRM activities, which suggests that F2 loaders have a lower
11 324 awareness regarding the challenge of climate change. In any event, respondents loading highly
12 325 on F2 differ from all other factors by strongly agreeing that climate change brings only negative
13 326 benefits such as “disasters” or “calamities” (S12).

14 327

15 328 The grassroots perspective is also characterised by the highest ranking of the statement claiming
16 329 that more urgent problems exist than climate change (S13). It is sustained by the idea that
17 330 people will take measures against climate change only if they are badly affected (S14). For one
18 331 PO representative (Q12), a “day-by-day” way of living along with a “wait and see” attitude makes
19 332 common sense.

20 333

21 334 In terms of approach to adaptation and planning practices, the grassroots perspective is
22 335 characterized by a stronger reliance upon technical and scientific knowledge for addressing
23 336 climate risks. Regarding climate risk assessment, this perspective distinctively supports that
24 337 hazard maps should be made by external experts, not by local people (S30). Respondents
25 338 loading highly on F2 see the former as “the ones telling which area is dangerous” (Q11). Along
26 339 with this stance, F2 does not value the importance of asking local people to recall past severe
27 340 weather events as much as all other factors (S29). Meanwhile, F2 also stands out from all other
28 341 factors by a self-reliant attitude regarding disaster response, particularly given the positive score
29 342 attributed to statement 22. Based on their experience, F2 loaders comment that the community is
30 343 faster than LGUs because it is the first one affected, and thus the first one to respond.

31 344

32 345 *4.3. The developmental perspective*

33 346

34 347 F3 represents a developmental perspective that supports planned adaptation, but advocates for
35 348 a strong role of individuals and local community actors in planning practices. This factor is built
36 349 upon the viewpoint of five government officers from the *barangay*, municipal, and national level,
37 350 three NGO workers, and one PO representative. The developmental perspective is positively
38 351 correlated with the institutional perspective ($p=0,798$), but differs by a stronger commitment for
39 352 social development.

40 353

41 354 F3 comes into a developmental perspective with statement 15 that advocates for improved living
42 355 conditions in order to face climate change impacts. A municipal officer (Q22) scored this
43 356 statement positively, arguing that one may be more adaptive if basic needs are satisfied.
44 357 Respondents from the NGO sector in turn further argue that improved quality of life would allow
45 358 “co-opting more easily with the effects of disasters” (Q20), “mak[ing] relocation easier” (Q17) in
46 359 case of disasters, increasing people participation to DRRM activities, and improving community
47 360 resilience in general.

48 361

49

50

51

52

53

54

55

1
2
3 362 Besides, the developmental perspective strongly believes that projects from NGOs can be
4 363 sustained (S21). One Municipal planning and development officer for instance explains that many
5 364 NGO based projects are still running within his municipality today. In his view, reasons for such a
6 365 success belong to the project design which should be prepared with both the community and the
7 366 local government. Projects with “strong sustainability factors” (Q21) will be ensured to be
8 367 institutionalized at both the Municipality and the Barangay level. While the developmental
9 368 perspective values NGOs’ work, it also strongly values, along with the institutional perspective,
10 369 the role of Barangays in responding to climate change impacts and improving adaptive capacity
11 370 (S19).

12 371
13 372 Another major characteristic of F3 is an approach to adaptation valuing the role of individuals and
14 373 local community actors. This is represented by the negative ranking of the distinguishing
15 374 statement which claims that people will take measures against climate change only if they are
16 375 badly affected (S14). One municipal officer (Q21) justifies his view by claiming that people’s
17 376 awareness regarding DRRM and CCA has improved compared to 20 years ago. This belief in
18 377 individuals’ capacity for mobilization is also highlighted within this perspective through the idea
19 378 that local citizens do know about the challenge of climate change (S25). In this regard, it
20 379 positively values the integration of local knowledge in climate risk assessment (S31). A NGO
21 380 worker (Q20) for instance gave this statement a positive score by reporting that local
22 381 communities can mark water levels on their house in order to monitor and make comparisons
23 382 from one year to another.
24 383

25 384 Lastly, F3 is a pro-planning, but anti-hard measures approach to climate change adaptation. The
26 385 developmental perspective strongly supports the formulation and implementation of plans for
27 386 reducing climate risks (S26), but poorly values hard adaptation measures by distinctively
28 387 supporting that building dikes and sea walls is not a long-term solution (S34).
29 388

30 389 *4.4. The physical planning perspective*

31 390
32 391 F4 is a physical planning perspective that supports planned adaptation by emphasizing the
33 392 importance of spatial planning practices (including building hazard mitigating infrastructures and
34 393 land use zoning). It is driven by a strong awareness of local disaster risk management issues and
35 394 the need for urgent, technical responses to current climate change impacts. This factor is
36 395 represented by two local government officers (one municipal planning and development officer
37 396 and one *barangay* officer) involved in the implementation of disaster risk reduction and
38 397 management plans, and one PO representative from an island Barangay experiencing increasing
39 398 tide heights.
40 399

41 400 A first major component of F4 is to highly value spatial planning measures for addressing climate
42 401 risks. F4 presents statistically significant rankings for several statements promoting land use
43 402 zoning measures and hazard-mitigating infrastructures. Firstly, the statement claiming that land
44 403 use measures like zoning will prevent from natural hazards received a distinguishing positive
45 404 score (S32). As a zoning officer, one respondent from a municipal government (Q27) referred to
46 405 the municipality’s land use plan and zoning ordinance, arguing that all plans should integrate
47 406 disaster risk prone areas. In line with this pro-land use zoning perspective on climate change
48 407 adaptation, F4 loaders consider that relocation is one of the best options to avoid floods (S38).
49 408 Then, the physical planning perspective on adaptation is also determined by the ranking of

1
2
3 409 statements addressing the development of hazard-mitigating infrastructures (S35, S36, and S37).
4 410 Respondents loading significantly on F4 justified their answers arguing that sea walls can help
5 411 prevent floods, that better roads should be built, and that building well-designed sewerage
6 412 systems will prevent the risk of flood.
7 413

8 414 A second major component of F4 is a moderate account for individuals and communities' role in
9 415 climate change adaptation. F4 presents a low agreement on the statement advocating more
10 416 participation from local communities in disaster preparedness activities (S23). This stance comes
11 417 into sharp perspective by disagreeing about the idea that community responses to calamities are
12 418 faster and more efficient than LGUs responses (S22). One municipal officer (Q27) explains his
13 419 score telling that communities must be trained to be efficient. The physical planning perspective,
14 420 however, is well grounded in local socio-economic and environmental realities. These distinct
15 421 characteristics rely upon several significantly different claims: that devastating calamities did exist
16 422 30 year ago; that improving living conditions is essential in order to address climate risks; and
17 423 that plans should be initiated at the *barangay* level but are useless if they are not coordinated
18 424 with higher government levels (S05, S15, and S28).
19
20
21
22
23

24 425 5. Discussion

25 426
26 427 Actors' viewpoints on climate change adaptation and planning practices are held across four
27 428 empirically determined social perspectives. These perspectives present a high shared meaning,
28 429 which was illustrated by the positive and relatively high correlation between factors scores. This
29 430 is an evidence of major commonalities between perspectives that reflect a common interest or
30 431 culture-wide understanding among actors from the field of development planning regarding
31 432 climate change adaptation in the Philippines. The four social perspectives hold a common
32 433 agreement upon the idea that climate change is a reality impacting many different sectors that
33 434 should be addressed pro-actively (see consensus statements 9, 11 and 24). Besides,
34 435 development planning is an activity positively valued within each social perspective. In particular,
35 436 participatory approaches with multiple actors are supported among all perspectives for
36 437 implementing inclusive planning practices (S27 and S23). In this regard, results are consistent
37 438 with the observation of Few et al. (2007) that discourses of inclusive governance advocating
38 439 participation are widespread among actors involved in climate change adaptation.
39 440

40 441 Yet, results also suggest more complexity in implementing adaptation strategies than
41 442 commonalities among perspectives first indicate. Along with Pelling's (2011) observation about
42 443 the existence of multiple actors' viewpoints on how to adapt, the four social perspectives
43 444 identified provide evidence that actors from the field of development planning in the Philippines
44 445 do hold divergent viewpoints when it comes to frame climate change adaptation and prioritize
45 446 planning activities. While addressing climate change and building inclusive planning practices is
46 447 commonly valued as a desired *end*, differences between perspectives emerge when considering
47 448 the *means* of implementing adaptation processes through planning practices. In particular,
48 449 perspectives present major differences regarding how multiple actors should be involved in
49 450 planning activities. This can best be exemplified by differences among the physical planning and
50 451 grassroots perspectives.
51 452

52 453 Although the physical planning perspective acknowledges the importance of participatory
53 454 approaches, it holds a critical attitude towards community's adaptive capacity by supporting the
54
55
56
57
58
59
60

1
2
3 455 idea that individual actors cannot address climate risks without being trained and prepared to be
4 456 efficient. By contrast, the grassroots perspective does not consider governments as essential for
5 457 enacting adaptation. In terms of disaster responses for instance, this perspective promotes
6 458 adaptive strategies that build upon community's role and the "*Bayanihan* system" (i.e. a Filipino
7 459 expression designing a spirit or attitude of communal unity to achieve a particular objective).
8 460 Such a differing prioritization regarding the role of community and government actors in planning
9 461 practices thus provide evidence that divergent adaptation strategies may emerge among actors
10 462 from the field of development planning.
11 463

12 464 These findings contribute characterizing how development planning can guide adaptation
13 465 thinking in at least two ways. First, results highlight that the four social perspectives identified
14 466 among development actors in the Philippines support differently the two main forms of adaptation
15 467 (planned and autonomous) commonly identified in the climate change literature (Agard et al.,
16 468 2014; Hedger et al., 2011). The grassroots perspective supports autonomous adaptation and the
17 469 physical planning perspective highly supports planned adaptation. Yet, the institutional
18 470 perspective only advocates for planned adaptation to a lesser extent, and the development
19 471 perspective supports both planned and autonomous adaptation strategies. In order to strengthen
20 472 adaptive capacity, this suggests it is also essential to appraise development planning not only as
21 473 a two-way process where planned and autonomous forms of adaptation may compete as
22 474 divergent adaptation strategies, but also as a process driven by actors that combine those two
23 475 approaches to adaptation in creative ways.
24 476

25 477 Second, each social perspective offers an essential starting point to foster the development of
26 478 adaptation strategies involving multiple actors across scales. Although Resurreccion et al. (2008)
27 479 pointed a mismatch between national and local level realities in the Philippines, results suggest
28 480 shared viewpoints exist among actors from multiple levels of the planning hierarchy. The social
29 481 perspectives identified both divide organisations and cut across boundaries between
30 482 organisational structures: each of the four social perspectives identified comprises actors from
31 483 both government agencies and civil society organisations at the national and local level. An
32 484 actor's structural position thus should not be considered as a single predictor of any form of
33 485 adaptation (neither planned nor autonomous). On the contrary, this suggests that development
34 486 planning has the capacity to develop processes that incorporate *a priori* distant levels of
35 487 individual and organisational actors.
36 488

37 489 Finally, while focusing on governments and civil society organisations among the formal planning
38 490 system in the Philippines proved being useful for investigating how development planning can
39 491 strengthen adaptive capacities, this research further highlights the need to expand the analysis
40 492 on actors from the informal domain. These may include actors from informal settlements or the
41 493 most vulnerable communities and households non-represented by formal civil society
42 494 organisations. Understanding their viewpoints and see how much these may relate to the four
43 495 perspectives extracted within this study would help better understand the extent to which the
44 496 adaptation strategies valued by formal actors may be accepted and effectively implemented
45 497 among these populations. In this regard, the continued use of Q-method is supported as a useful
46 498 qualitative and quantitative research technique allowing the engagement of multiple types of
47 499 actors in novel ways.
48
49
50
51
52
53
54
55
56
57
58
59
60

6. Conclusion

This paper aimed at capturing multiple social perspectives on climate change adaptation and planning practices across the organisational hierarchy of planning in the Philippines, and examined whether commonalities and differences among these perspectives may lead towards divergent or convergent adaptation strategies. Four empirically significant social perspectives were determined – institutional, grassroots, developmental, and physical planning – using Q-method, an intensive and quantitative technique. Major differences and commonalities between perspectives were highlighted, in addition to actors' arguments used to justify claims. These social perspectives are characterized by several distinctive stances regarding climate change adaptation and planning practices in the Philippines.

First, the institutional perspective values the role of government institutions for mainstreaming climate change adaptation into local development planning. Second, the grassroots perspective gives more prominence to environmental protection and the need for meeting basic needs, along with a self-reliant attitude towards disaster risks. Third, the developmental perspective advocates for the role of individuals and local community actors in planning practices. Fourth, the physical planning perspective values the importance of spatial planning measures (including building hazard mitigating infrastructures and land use zoning) and emphasizes the need for urgent, technical responses to current climate change impacts.

Results contribute filling a knowledge gap in the literature on the need to develop approaches that can guide adaptation thinking in development planning. They first provide evidence that differentiated viewpoints on climate change and planning practices may lead to divergent adaptation strategies (e.g. through a differing prioritization regarding the role of community and government actors). Yet, the four social perspectives identified also suggest that shared adaptations may emerge both among actors from multiple organizational structures and across the organisational hierarchy of planning.

In terms of policy and practice, this highlights the need for developing approaches that facilitate the inclusion of these multiple perspectives. In particular, development planning should continue to focus on building learning processes that bring around the table multiple actors with diverse values and worldviews for developing a common understanding on how to strengthen adaptive capacities. This calls for directing attention to negotiations and the creation of spaces for the emergence of cross-scale relationships and shared power between actors. More than accounting for the multiplicity of viewpoints, development planning requires creating participatory venues for negotiation and sharing decision-making through collaborative actions. One example is creating participatory planning mechanisms that ensure the inclusion of actors from all levels of the planning hierarchy, rather than solely relying upon scientific and government actors for instance. When accounting for cross-scales relationships among actors and creating new spaces of shared meaning and action, development planning becomes a promising candidate for strengthening adaptive capacities and delivering more effective responses to climate change.

References

- Abdi, H. (2003). Factor rotations in factor analyses. In M. Lewis-Beck, A. Bryman, & T. Futing (Eds.), *Encyclopedia of social science research methods* (pp. 792-795). Thousand Oaks: Sage.
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005). Successful adaptation to climate change across scales. *Global Environmental Change*, 15(2), 77-86. doi:10.1016/j.gloenvcha.2004.12.005
- Agard, J., Schipper, E. L. F., Birkmann, J., Campos, M., Dubeux, C., Nojiri, Y., . . . Bilir, T. E. (2014). Annex II: Glossary. In V. R. Barros, C. B. Field, D. J. Dokken, M. D. Mastrandrea, K. J. Mach, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, & L. L. White (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1757-1776). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- AKP (2012) *Desktop study on assessment of capacity gaps and needs of South East Asia countries in addressing impacts, vulnerability and adaptation to climate variability and climate change*. Regional Climate Change Adaptation Knowledge Platform for Asia: Thailand.
- Bardsley, D. K., & Sweeney, S. M. (2010). Guiding climate change adaptation within vulnerable natural resource management systems. *Environmental Management*, 45(5), 1127-1141.
- Barry, J., & Proops, J. (1999). Seeking sustainability discourses with Q methodology. *Ecological Economics*, 28(3), 337-345.
- Birkmann, J., Welle, T., Krause, D., Wolfertz, J., Suarez, D. C., & Setiadi, N. (2011). World risk index: Concept and results. In ADW & UNU-IEHS (Eds.), *World risk report 2011* (pp. 13-43). Berlin: Alliance Development Works.
- Blanco, H., Alberti, M., Forsyth, A., Krizek, K. J., Rodríguez, D. A., Talen, E., & Ellis, C. (2009). Hot, congested, crowded and diverse: Emerging research agendas in planning. *Progress in Planning*, 71(4), 153-205. doi:10.1016/j.progress.2009.03.001
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.
- Bulkeley, H., & Betsill, M. (2005). Rethinking sustainable cities: Multilevel governance and the 'urban' politics of climate change. *Environmental politics*, 14(1), 42-63.
- Cañares, M. (2014) *Briefing: Assessing open governance data in Bohol*. STEP UP Consulting: Bohol. 1 p.
- Capili, E. B., Ibay, A. C. S., & Villarin, J. R. T. (2005, 19-23 September). *Climate change impacts and adaptation on Philippine coasts*. Paper presented at the Proceedings of the International Oceans 2005 Conference, Washington D.C, USA.
- Cash, D. W., & Moser, S. C. (2000). Linking global and local scales: designing dynamic assessment and management processes. *Global Environmental Change*, 10(2), 109-120.
- Corfee-Morlot, J., Cochran, I., Hallegatte, S., & Teasdale, P.-J. (2011). Multilevel risk governance and urban adaptation policy. *Climatic change*, 104(1), 169-197.
- Cutter, S., Osman-Elasha, B., Campbell, J., Cheong, S.-M., McCormick, S., Pulwarty, R., . . . Ziervogel, G. (2012). Managing the risks from climate extremes at the local level. In C. B. Field, V. Barros, T. F. Stocker, D. Qin, D. J. Dokken, K. L. Ebi, M. D. Mastrandrea, K. J. Mach, G.-K. Plattner, S. K. Allen, M. Tignor, & P. M. Midgley (Eds.), *A special report of working groups I and II of the Intergovernmental Panel on Climate Change (IPCC)* (pp. 291-338). Cambridge: Cambridge University Press.
- DILG (2008) *Rationalizing the Local Planning System: A Source Book*. Department of the Interior and Local Government: Bureau of Local Government Development: Quezon City, Philippines.

- 1
2
3 Eden, S., Donaldson, A., & Walker, G. (2005). Structuring subjectivities? Using Q methodology in
4 human geography. *Area*, 37(4), 413-422.
- 5 Engle, N. L., & Lemos, M. C. (2010). Unpacking governance: building adaptive capacity to
6 climate change of river basins in Brazil. *Global Environmental Change*, 20(1), 4-13.
- 7 Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change
8 adaptation: Avoiding the illusion of inclusion. *Climate policy*, 7(1), 46-59.
- 9 Friedmann, J. (1987). *Planning in the public domain: From knowledge to action*: Princeton
10 University Press.
- 11 Füssel, H.-M. (2007). Adaptation planning for climate change: concepts, assessment
12 approaches, and key lessons. *Sustainability science*, 2(2), 265-275.
- 13 Hall, P. (1982). *Urban and Regional Planning* (3rd ed.). London: George Allen & Unwin.
- 14 Hedger, M., Moench, M., Dixit, A., Kaur, N., & Anderson, S. (2011) *Approaches to planning for*
15 *climate change: Bridging concepts and practice for low carbon climate resilient*
16 *development*. Institute of Development Studies: Brighton. 39 p.
- 17 Huntjens, P., Lebel, L., Pahl-Wostl, C., Camkin, J., Schulze, R., & Kranz, N. (2012). Institutional
18 design propositions for the governance of adaptation to climate change in the water
19 sector. *Global Environmental Change*, 22(1), 67-81.
- 20 IDS. (2010, 18-19 May). *Strengthening climate resilience: Philippines national consultation*.
21 Paper presented at the Proceedings of the First National Consultation on Strengthening
22 Climate Resilience in the Philippines, Quezon City, Philippines.
- 23 Inderberg, T. H., Eriksen, S., O'Brien, K., & Sygna, L. (2014). *Climate change adaptation and*
24 *development: Transforming paradigms and practices*. London: Routledge.
- 25 Leck, H., & Simon, D. (2013). Fostering multiscale collaboration and co-operation for effective
26 governance of climate change adaptation. *Urban Studies*, 50(6), 1221-1238.
- 27 McKeown, B., & Thomas, D. (1988). *Q methodology*. Newbury Park (CA): Sage.
- 28 Murdoch, J. (2006). *Post-structuralist Geography: a Guide to Relational Space*. London, UK:
29 SAGE Publications.
- 30 O'Brien, K. (2009). Do values subjectively define the limits to climate change adaptation? In W.
31 N. Adger, I. Lorenzoni, & K. L. O'Brien (Eds.), *Adapting to climate change: Thresholds,*
32 *values, governance* (pp. 164-180). Cambridge: Cambridge University Press.
- 33 O'Brien, K., & Selboe, E. (2015). *The Adaptive Challenge of Climate Change*: Cambridge
34 University Press.
- 35 Pelling, M. (2011). *Adaptation to climate change: from resilience to transformation*. London:
36 Routledge.
- 37 Pini, B., Previtte, J., & Haslam-McKenzie, F. (2007). Stakeholders, natural resource management
38 and Australian rural local governments: A Q methodological study. *Local Government*
39 *Studies*, 33(3), 427-449.
- 40 Potter, R. B. (1985). *Urbanisation and planning in the third world: Spatial perceptions and public*
41 *participation*. London: Routledge.
- 42 Pugh, J., & Potter, R. B. (2003). *Participatory planning in the Caribbean-lessons from practice*:
43 Ashgate Publishing Ltd.
- 44 Resurreccion, B. P., Sajor, E. E., & Fajber, E. (2008) *Climate adaptation in Asia: Knowledge*
45 *gaps and research issues in South East Asia*. ISET-International and ISET-Nepal:
46 Kathmandu.
- 47 Rincón, M. F. G., & Virtucio, F. K. (2008, June). *Climate change in the Philippines: A contribution*
48 *to the country environmental analysis*. Paper presented at the Proceedings of the Country
49 Environmental Analysis Consultative Workshops, Manila, Philippines.
- 50 Robbins, P. (2005). Q methodology. *Encyclopedia of social measurement*, 3, 209-215.
- 51 Robbins, P., & Krueger, R. (2000). Beyond bias? The promise and limits of Q method in human
52 geography. *The Professional Geographer*, 52(4), 636-648.
- 53 Shaw, A., Sheppard, S., Burch, S., Flanders, D., Wiek, A., Carmichael, J., . . . Cohen, S. (2009).
54 Making local futures tangible—synthesizing, downscaling, and visualizing climate change
55 scenarios for participatory capacity building. *Global Environmental Change*, 19(4), 447-
56 463.
- 57
58 Stephenson, W. (1935). Technique of factor analysis. *Nature*.
- 59
60

- 1
2
3 Stephenson, W. (1965). Perspectives in Psychology: Definition of opinion, attitude, and belief.
4 *Psychological Record*, 15(2), 281-288.
- 5 Van Aalst, M. K. (2006). The impacts of climate change on the risk of natural disasters.
6 *Disasters*, 30(1), 5-18.
- 7 Yohe, G. W., Lasco, R. D., Ahmad, Q. K., Arnell, N. W., Cohen, S. J., Hope, C., . . . Perez, R. T.
8 (2007). Perspectives on climate change and sustainability. In M. L. Parry, O. F. Canziani,
9 J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate change 2007:
10 Impacts, adaptation and vulnerability. Contribution of working group II to the fourth
11 assessment report of the Intergovernmental Panel on Climate Change (IPCC)* (pp. 811-
12 841). Cambridge, UK: Cambridge University Press.
- 13 Zabala, A. (2014). qmethod: A package to explore human perspectives using Q methodology.
14 *The R Journal*, 6(2), 1-11.
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Review Only

Table 1.: Respondent characteristics

Organisational and individual actor	n	Adaptation type		Location
		<i>National</i>	<i>Autonomous</i>	
Government agency	20			
National officer	2	X		Manila
Regional officer	2	X		Cebu city
Provincial officer	5	X		Bohol
Municipal officer	6	X		Bohol
Barangay officer	5	X	X	Bohol
Civil society organisation	17			
Social development NGO representative	5		X	Bohol
Environmental NGO representative	6		X	Bohol
People's Organization representative	6		X	Bohol
	37			

For Review Only

Table 2. Rotated factor loadings¹

Q-sort	F1	F2	F3	F4
Q01: Provincial planning and development officer	0,876*	0,261	-0,122	-0,182
Q02: National climate change commission officer	0,844*	-0,128	-0,198	0,367
Q03: Provincial governance officer	0,723*	0,336	0,043	-0,125
Q04: Regional economic development officer	0,698*	-0,381	0,320	0,130
Q05: Regional planning and development officer	0,668*	0,184	-0,116	0,144
Q06: NGO representative	0,601*	0,209	0,155	-0,112
Q07: Provincial environment officer	0,545*	-0,131	0,090	0,089
Q08: Environmental NGO representative	0,447*	-0,292	0,287	0,426
Q09: People's Organization representative	-0,072	0,982*	-0,074	-0,071
Q10: Provincial civil society officer	-0,027	0,831*	-0,066	0,176
Q11: People's Organization representative	0,170	0,659*	0,064	0,071
Q12: People's Organization representative	0,291	0,618*	-0,132	0,042
Q13: Municipal Planning and Development Officer	-0,098	0,576*	0,116	0,055
Q14: NGO representative	0,428	0,559*	-0,014	0,115
Q15: Environmental NGO representative	0,566	0,484*	-0,071	-0,113
Q16: Environmental NGO representative	0,213	0,447*	0,503	-0,240
Q17: Environmental NGO representative	0,026	0,007	0,789*	0,121
Q18: Barangay Disaster Risk Reduction Management officer	-0,107	0,236	0,709*	0,053
Q19: Barangay Disaster Risk Reduction Management officer	0,275	-0,099	0,704*	-0,142
Q20: NGO representative	0,164	-0,36	0,703*	0,312
Q21: Municipal Planning and Development Officer	0,460	-0,113	0,668*	-0,207
Q22: Representative of Municipal Planning and Development Officers	0,298	0,158	0,483*	0,059
Q23: Environmental NGO representative	0,075	0,351	0,481*	-0,102
Q24: National disaster risk reduction management officer	0,355	-0,056	0,469*	-0,050
Q25: People's Organization representative	0,329	0,209	0,464*	-0,183
Q26: Municipal Disaster Risk Reduction Management officer	-0,122	0,044	-0,089	0,982*
Q27: Municipal Planning and Development Officer	0,137	0,095	0,074	0,629*
Q28: Barangay representative	0,115	0,223	0,111	0,616*

¹ Values grouped by defining sorts (*) then sorted in decreasing order

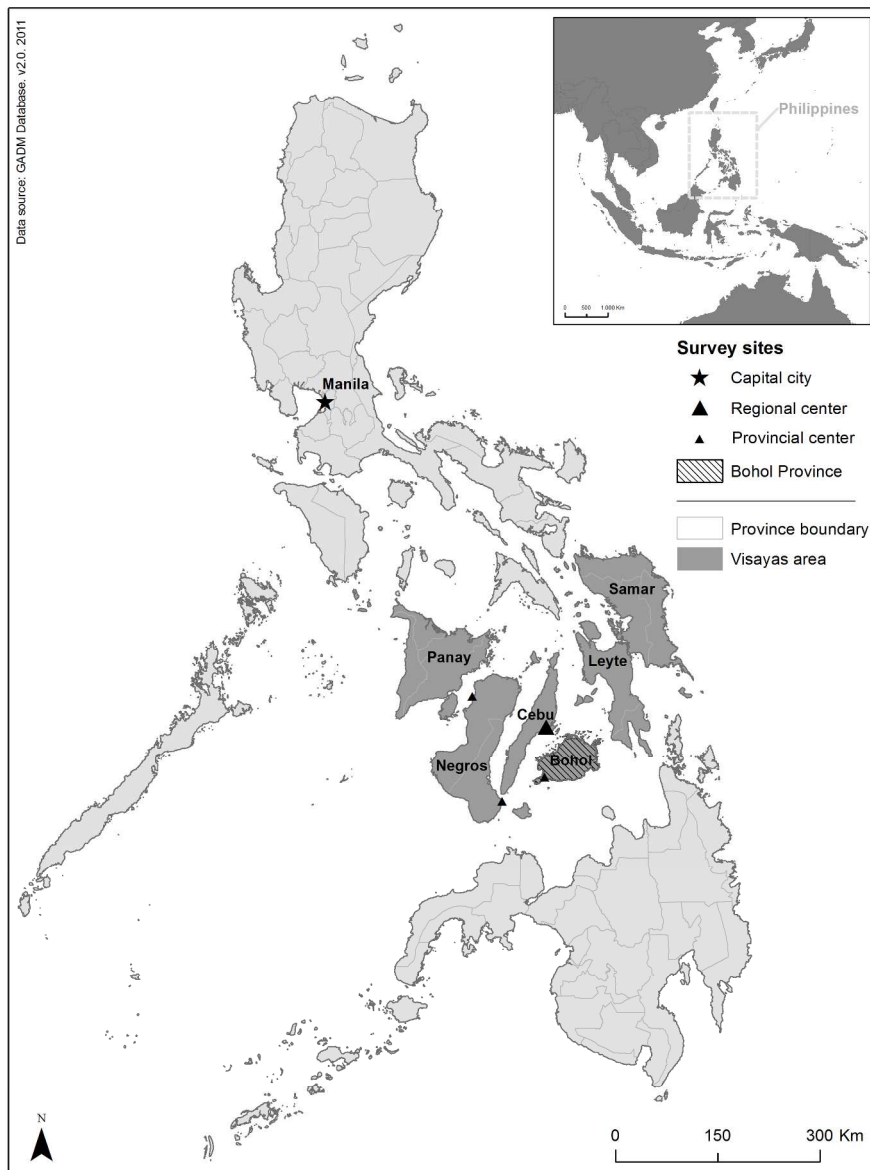
Table 3. Factor scores and rank statement scores for Q-sort statements

No	Statement	F1		F2		F3		F4	
		Z	Rank	Z	Rank	Z	Rank	Z	Rank
<i>Climate change perception</i>									
S01	Weather conditions are important in people's daily life	1,44	3	1,02	2	1,29	3	0,16^a	1
S02	Disasters are natural. We cannot go against nature	-0,60 ^d	-1	1,78 ^d	3	0,02	0	0,16	1
S03	Taking care of Mother Nature will prevent devastating calamities	1,12	2	1,76 ^d	3	0,77	1	0,16	1
S04	Start of the rainy and dry season has become unpredictable	1,09	2	0,28	1	1,14	2	0,10	-1
S05	Severe weather events and devastating calamities did not exist 30 years ago	-0,66 ^d	-1	-0,05 ^d	-1	-1,14	-2	-1,74	-2
S06	Our coastlines are being eroded because of climate change and sea level rise	0,20	0	-0,55 ^a	-1	0,55	1	0,13	0
S07	The idea of climate change is just a buzz word from national agencies and international institutions	-1,81	-3	-1,76	-3	-1,73	-3	0,77^a	1
S08	People observed changes in the seasons before scientists start talking about 'climate change'	0,76	1	-0,04	-1	0,56	1	0,13	0
S09	There is no clear evidence that the climate is changing in my area	-1,59 ^c	-3	-1,68 ^c	-3	-1,32 ^c	-3	-1,81 ^c	-3
S10	Climate change is a problem that only affects the poor	-2,31	-3	-1,06 ^a	-2	-1,95	-3	-1,84	-3
S11	Climate change leads to negative impacts in many different sectors such as water, agriculture, tourism, and health	1,02	2	1,58	3	1,03	2	1,00	2
S12	Climate change is not only a threat, it also brings positive benefits	0,81 ^d	1	-1,65^d	-2	-0,77 ^d	-1	0,00 ^d	-1
<i>Adaptation approach</i>									
S13	There are more urgent problems in my area than climate change	-0,33	-1	0,13	0	-0,64	-1	0,03	-1
S14	People will take measures against climate change only if they are directly badly affected	-0,38	-1	0,96 ^d	2	-1,01 ^d	-2	0,13	0
S15	Improving people's living conditions is the most important measure to take for facing climate change impacts	-0,54	-1	-0,77	-2	0,01 ^d	0	1,03 ^d	2
S16	Best responses to climate change are the ones answering a demand from local citizens	-0,17 ^c	0	-0,55 ^c	-1	-0,35 ^c	-1	-0,81 ^c	-2
S17	Adapting to climate change means only preparing for more natural disasters such as floods, storms, landslides, and typhoons	-1,51	-2	1,48 ^d	3	0,36 ^d	0	-0,94	-2
S18	Planting trees to reduce carbon dioxide (CO2) emissions is more important than learning how to face disasters	-0,20	-1	-0,71	-1	-0,90	-2	0,03	-1
S19	Barangays should conduct trainings to explain people what to do to avoid adverse effects of climate change	1,23	3	0,21^a	1	1,38	3	1,06	3
S20	NGOs play a better role than Government institutions to build the capacity of local communities because they work closer to the people	-1,07^a	-2	-0,02	-1	-0,27	0	0,03	-1
S21	Community-based projects from NGOs are difficult to sustain. Benefits for the community are often limited in time	0,45	1	0,88	1	-0,80 ^d	-1	0,06	-1
S22	Community response to calamities is faster and more efficient than LGU responses	-0,08	0	0,14	0	-0,77	-1	-0,84	-2
S23	People should participate to disaster preparedness activities, this is their duty as citizens	1,22	3	0,93	2	1,43	3	0,16 ^d	1
S24	The 'Bahala Na' attitude is a good way to face disasters	-1,85 ^c	-3	-1,88 ^c	-3	-2,22 ^c	-3	-1,78 ^c	-3
<i>Planning practices</i>									
S25	Local citizens don't know about the challenge of climate change, this is why national policies must be implemented at the local level	0,71	1	0,18	1	-0,43	-1	0,13	0
S26	Formulating and implementing plans reduces the risks from climate change	0,64	1	0,20	1	1,26^a	2	0,13	0
S27	LGUs should encourage more local community participation in the crafting of their plans	1,58	3	0,95	2	1,31	3	1,06	3
S28	A Barangay Disaster Risk Management plan is useless if it is not coordinated with plans from higher government units	-0,14	0	0,12	0	0,62	1	1,06	3
S29	Asking local people about past severe weather events they recall is essential for responding to potential future calamities	0,75	1	0,16 ^a	0	0,82	2	1,00	2
S30	Maps of hazardous areas should be made by local people, not by external consultants or experts who don't know the area	-0,26	-1	-2,18 ^d	-3	0,43	0	0,16	1
S31	Local communities can identify flood zones with great accuracy	0,02	0	0,16	0	0,66 ^a	1	0,03	-1
S32	Land use measure like zoning will prevent from natural hazards	0,06	0	0,11	0	0,01	0	1,03^a	2
S33	Planting mangroves is the best natural defence against storms	0,90	2	0,92	1	0,32 ^d	0	1,90 ^d	3
S34	Forests should be preserved and more trees should be planted to avoid landslides	1,04	2	1,02	2	0,77	1	0,16	1
S35	Building dikes and sea walls to avoid floods is not a long-term solution	0,32	0	0,06	0	0,81 ^d	1	-1,68 ^d	-2
S36	People would be less affected by heavy rains if we had appropriate drainage and sewerage systems	0,38	0	0,06	0	0,47	0	1,10	3
S37	Our road infrastructures (roads, bridges) are strong enough to face climate change impacts	-0,70	-2	-0,79	-2	-1,15	-2	-2,65^a	-3
S38	The best option to avoid flooding is relocating residents	-1,07	-2	0,00 ^d	0	-0,96	-2	0,97 ^d	1
S39	Relocating residents from risk prone coastal areas to upland areas is not viable because they will lose their livelihood	-1,15	-2	-0,80	-2	-0,72	-1	0,13^a	0
S40	People build houses in risk-prone areas because laws and building codes are not strictly enforced	0,69	1	-0,58 ^d	-1	1,09	2	0,13	0

a = distinguishing statement of factor i only; *d* = distinguishing statement of one factor or more; *c* = consensus statement

Note: Differences between pairs have a minimum significance at the 0,05 level. Statement loadings with differences between all pairs significant at the 0,01 level are labelled in bold.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60



215x279mm (300 x 300 DPI)