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REPORT

Environment and Mobility: A View from Four Discourses

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Abstract Debate and literature on the link between degrading environments and human mobility has been increasing exponentially. There is little concrete evidence, however, of efforts or policies that support the management of environmentally influenced mobility. Through discourse analysis using Q-methodology, this research aimed to scrutinize the standoff between opposing views under a fresh lens. One-hundred and ninety-seven experts from 49 nations completed an on-line survey asking them to sort, by level of agreement, 42 statements gleaned from the literature concerning the environment-mobility nexus. Four very different discourses emerged: determined humanists, benevolent pragmatists, cynical protectionists, and critical realists. The complexity of these discourses helps explain the stalemate while confirming the inappropriateness of one-sided terminology and linear quantifications. Despite diametrically opposed viewpoints, experts unanimously agree that human mobility is connected to environmental change. Dissection of these social perspectives builds a new foundation for the Rio+20 analysis and policy deliberations related to environmentally influenced human mobility.

Keywords Environmentally influenced mobility · Complexity · Environmental change · Discourse · Q-methodology

INTRODUCTION

The present research aims to delineate and dissect discourses that coexist at the interface of the environment and human mobility. The research questions being asked are "what are the discourses that are upheld by the current body of actors dealing with the phenomenon?" and "can an exploration of the discourses shed light on the intransigence that characterizes the environment-mobility nexus to date"? Without defining these discourses a priori, a set of phrases that synthesize the extent of the current debate were extracted directly from the literature. Scientists and practitioners with special knowledge and/or interest in the subject (henceforth named *experts*) were invited to evaluate how strongly they agreed (or disagreed) with the statements. Factor analysis was conducted using Q-methodology to extract the dominant factors—groups of experts adhering to a particular discourse. The ultimate goal of the research is to inform policy on environmentally influenced mobility (EIM).

The analysis examines EIM from four very different vantage points. Below, the concepts of EIM and discourse analysis are introduced. "Framing policy issues on the migration–environment nexus" section presents the predominant issues fuelling controversy at the interface of environment and mobility. Details on Q-methodology follow in "Methodology and analysis" section, subsequently elucidating, in "Results" section, the resulting four discourses. "Discussion" section discusses the debate across discourse coalitions, and "Conclusion" section proposes opportunities and steps forward.

ENVIRONMENTALLY INFLUENCED MOBILITY

Unequivocal climate change is occurring and societies and science are increasingly focused on adapting to both anticipated and surprise impacts. Although human beings have always demonstrated great ability to adapt to change, the unprecedented pace and unpredictability of impacts—

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such as degrading environments—will inevitably amplify the process. Following the motto "control, adapt or flee" (Renaud et al. 2007), when "techno-fixes" of nature are not possible and on-site adaptation is no longer feasible, flight—human mobility—surfaces as either a planned strategy or a reaction to dire circumstances. EIM in this article encompasses purely voluntary migration, forced displacement, and everything between these two extremes (Morinière 2012).

Debate among disciplines on the precise force driving this mobility is substantial. Economists have long touted purely monetary influences at both origin (poverty) and destination (job opportunities, utility, and profit maximization) (Mougeot 1992). Psychologists have identified rationality (risk aversion, preferred lifestyles) as push or pull factors (Fawcett 1985). Human geographers credit space—distance or gravity models (Rogers 2008)—and physical scientists, ecosystem degradation, as key triggers (Lonergan 1998). Disaster risk scientists cite extreme hazard events (floods, drought, etc.) as catalysers (UNOCHA and IDMC 2009), while climatologists cite changes in temperature or precipitation (IPCC 2007). Sustainable development workers point to mega-projects such as dams that uproot entire communities (Saxena 2008). To reconcile these viewpoints, interdisciplinarians have but one choice: to explore intricate combinations of multiple drivers.

DISCOURSE AND DISCOURSE ANALYSIS

A *discourse* is the process of reasoning and articulation of concepts or ideas that, anchored in a context (time/space), can forcefully create order or meaning (Alvesson and Kärreman 2000, pp. 1126–1127). They lend support to a method of inquiry known as "discourse analysis"—a *reasoning* that may produce "knowledge regimes" or "shared meaning of a phenomenon" (Adger et al. 2001). Discourses, then, create shared perspectives and socially constructed realities. Their power, as supported by classic Foucault analyses (1991) may cause a discourse to become hegemonic (Hajer 1995).

One of the most common applications of critical discourse analysis in environmental and climate change is the study of media impact (Antilla 2005; Farbotko 2005; von Storch and Krauss 2005; Sonnett et al. 2006; Carvalho 2007; Doulton and Brown 2009; Russill and Nyssa 2009). Ample literature exists to describe this methodology, especially in the field of linguistics (Wodak and Meyer 2009) and the present research has no such ambition. General discourse analyses can take many forms; Glynos et al. (2009) proposed six types, each with a specific ontology, object, and parameter set. Among them, "Q-methodology" has the attribute of seeking to identify shared discourses. An entire volume of *Operant Subjectivity* has focused on the use of Q-methodology in discourse analysis (Stainton-Rogers 1997–1998). Contemporary discourse analyses, Q-methodology included, are generally characterized by and result in a description of *narratives* or *storylines* (Hajer 1995). In addition, since shared attitudes, opinions, perspectives, or viewpoints help to describe a discourse, these terms commonly become synonymous.

Only one discourse analysis was found to explore EIM. Therein, "discursive politics" in the United Nations—driven by fear (and xenophobic sentiment of the global "North") and the transnational nature of environmental degradation (making it easy to cast blame elsewhere) were blamed for the current absence of policy protecting those who are environmentally displaced (McNamara 2007).

FRAMING POLICY ISSUES ON THE MIGRATION–ENVIRONMENT NEXUS

The purpose of this section is not to summarize the main issues within the environment–mobility nexus; these have already been amply covered in the literature (Warner 2010). Rather, it provides a concise synopsis of controversial issues that may lend themselves most readily to policy reform.

Past research has inventoried at least 13 different names for those who become mobile at least partially for environmental reasons (Erway Morinière 2009). The most common term, "environmental refugee," first appeared in 1984 (IIED 1984). A term defended initially by interest groups, "climate refugee," appeared more recently (FOE 2006). The use of the term "refugee" has incurred substantial debate because since 1951,[1] it has been officially reserved for those crossing an international boundary with "well-founded fear" of political persecution. Some call any use of the term "legally and institutionally unfounded" (McGregor 1994); others insist that the official definition be widened (Richmond 2001). Most scholars currently agree, however, that a good proportion of contemporary human mobility occurs within national borders (often resulting in urbanization or, more generally, "internally

[1] The definition of "refugee", first provided under Article 1A of the 1951 UN Convention Relating to the Status of Refugees, and amended by the 1967 Protocol, has four key parts:

- the person must be outside their country of nationality or former habitual residence;
- the person must fear persecution;
- the fear of persecution must be for reasons of one of the five convention grounds (race, nationality, religion, membership of a particular social group or political opinion); and
- the fear must be well founded.

displaced persons", IDPs). Unprotected by a UN resolution—or any consensus on what to call them—the environmentally mobile are at best insufficiently supported by governmental policy, if not neglected or completely invisible. Legal recognition and protection, then, depend on some level of agreement regarding terminology and definitions.

Scholars and practitioners have also ignited debate with projections of environmental migrants ranging from 50 million in 2010 (Boano et al. 2008) to 200 million (FOE 2006; Stern 2007) or even 1000 million (Christian Aid 2007) in 2050. In the absence of empirically compiled evidence of the global historical scale of the phenomenon, such projections hardly qualify as sound scientific practice. Valuable contributions to a systematic quantification of environmentally influenced migrants are limited. Senior policy makers from the International Organization for Migration (IOM/UNEP, pers. comm. 2009) and the United Nations Environment Program (UNEP) draw a clear connection between solid data on numbers of environmentally influenced migrants and the ability to develop appropriate policy. No matter how onerous the challenge, applying scientific method to produce the best possible estimates of environmentally influenced migrants through space and time is paramount for credible projections and appropriate policy.

METHODOLOGY AND ANALYSIS

Q-Methodology: Overview

The present survey and analysis engages Q-methodology, an old but little-known research tool (see http://www.qmethod.org/about.php) that applies purely quantitative measures to explore human subjectivity regarding, in this case, the environment–mobility nexus. Subjectivity refers to anything about which respondents might be communicable, to others or to themselves; rather than being controlled, subjectivity is the focus of inquiry in Q-methodology (Stephenson 1978). It explores subjectivity by breaking down the meaning and importance people assign to ideas and issues (Woods 2010) and grouping people with a "shared way of apprehending the world" (Dryzek 1998) into discourses. To explore the commonalities among people who share a discourse, scholars commonly refer to *coalitions* (Hajer 1993), or groups of actors and practices who share a social construct. This exploration is most insightful when it highlights how discourses become a means to political action or in the present case, inaction.

Invented by British psychologist-physicist Stephenson (1953), Q-methodology models participant perspectives on a given domain. Respondents (or "experts") are provided a "Q-sample" of elements (e.g., statements, ideas, images) and are asked to rank-order them according to specific conditions of instruction—most typically a scale of agreement (e.g., from "disagree" to "agree"). The result is a "Q-sort" of the elements fashioned entirely from the point of view of the respondent. Factor analysis is then applied to the Q-sorts; the resulting factors (following statistical rotation) bring to surface key components of subjectivity—that is, the dominant discourses within the domain under exploration.

Q-methodology has been used to explore issues as diverse as economic productivity and veterinary science. More specifically in the field of environment, Q-methodology has helped explore grazing management decisions made by shepherds (Cruz et al. 2007), climate change influences on citizen behavior (Niemeyer et al. 2005; Wolf et al. 2009) and the effectiveness of international environmental regimes (Frantzi et al. 2009). No applications of Q-methodology were found to explore human mobility.

Q-methodology is lauded for bringing to light underlying foundations of conflict that may be masked by rhetoric, thereby suggesting "opportunities for consensus building" (Focht and Lawler 2000). Further, it does not presuppose either polarization of understanding or unidimensional perspectives. It is considered participatory because experts are left to apply their own definitions of "agreement" and their own interpretation of the elements under study. The technique can readily be used on-line, thereby enabling the rapid capture of widely divergent opinions across the globe at minimal cost.

Q-Sample

Literature on the numerous yet controversial links between the environment and human migration provides a colorful "concourse of communication" (Stephenson 1978). For the current analysis, over 100 statements summarizing the major issues were extracted from 321 publications including both scientific journals and gray literature (Erway Morinière 2009). These statements, and a few others gleaned from preliminary interviews of experts conducted by the author in 2008, were coded and registered verbatim in a database along with the author name and publication date. The database was then trimmed to remove all statements duplicating viewpoints already registered. To the extent possible, the statements were edited to reflect singular thoughts without altering intended meaning and tone. Although the authors' names were not displayed in the Q-sample sorted by experts, many heavily quoted statements may have been recognized.

The range of debate on the environment–mobility nexus comprises four main issues which are summarized in Table 1 and described in greater detail below. *Drivers:* The

first issue deals with potential drivers of migration, denoting their nature (i.e. resource scarcity, degradation, disasters, economics, drought/desertification, ecology, or the climate). Given the variety of possible combinations of drivers, this is a major topic within the literature. *Terminology:* The second most common issue in the literature is how to refer to humans forced into mobility by environmental degradation. There is growing consensus on the term used in this paper, EIM. *Politically charged aspects:* Another issue revolves around political agendas and elements that go beyond the academic purview of the environment–mobility interface. These controversies reflect questions of national security, attribution and responsibility, protection and human rights, appropriate intervention, and the scale of attention merited when compared to other global concerns. *Quantification:* Few documents to date include global historical and projected estimates of EIM; those that do debate whether the flow of such migrants has increased or not, and the role of evidence (especially quantification) in guiding policy.

Condition of Instruction

Once the Q-sample was finalized as outlined above, an expert opinion survey was conducted with 197 experts in 49 countries. Experts were asked to sort the 42 statements according to their level of agreement with each, from extreme agreement (+4) to extreme disagreement (−4); a rank of "0" signified either lack of salience, neutrality, ambivalence, or uncertainty. Rather than providing an index of meaning, this scale enables the calculation of means and standard deviations.

Table 1 Q Sample structure

	Issue	Description
1	Drivers (18 statements)	Ability to isolate, utility of isolating drivers; specific drivers: scarcity, degradation, disasters, economics, drought/desertification, ecology or the climate
2	Terminology (10 statements)	Use of "refugee," specific names, definitions, including three proposed by Renaud/Dun'07
3	Politically charged aspects (9 statements)	Protection, legal recognition, national security, attribution and responsibility, and appropriate interventions
4	Quantification (5 statements)	Existing evidence, projections, and the direction of the flow of such migrants and the role of (or need for) more concrete evidence in guiding policy
Total: 42 statements		

Recruitment of Subjects

Q-Methodology has no requirement of a set sample size of subjects. Because it focuses on individual responses, large sample sizes are not required. The methodology has been applied with as few as one subject (a single subject would suffice to identify a discourse if s/he provided multiple points of view on the same topic) and more than 400 subjects. The most forthcoming subjects in a Q-sort exercise are generally experts within a domain who have already formed an opinion on the issue (Webler et al. 2009). Rather than a sample that is representative of a given universe (as in typical R-methodology), the goal of Q-methodology is to capture the *diversity of subjective opinion* within a universe. Given the global nature of EIM, this research aimed to obtain as many respondents as possible representing every continent. The full diversity of opinion, however, may have been captured in the first four subjects from a single continent; there is no known method to confirm how much of the universe is captured by a final set of subjects.

To compile a preliminary list of respondents, a literature review producing names of 506 authors (Erway Morinière 2009) was combined with lists of attendees of relevant UN conferences. Although most of the 715 respondents receiving an invitation are linked to universities or to bilateral or intergovernmental agencies and civil society organizations that deal with environment and/or migration issues across the globe, it is uncertain that their perspectives fully represent the viewpoints of those less likely to publish or to attend major conferences but with perhaps equally strong opinions on the subject. To help overcome some of these difficulties, each initially invited respondent was asked to forward the link to counterparts in the field or to networks they thought would also have an opinion—especially one diverging from their own. This snowball or cascading technique resulted in an unquantifiable number of additional respondents. The invitation was also sent to relevant listserves and entities (e.g., those specifically targeting migration, disasters, or the environment). Finally, surveys in PDF format were also provided by email allowing a few experts to forward their completed surveys by attachment.

Survey Administration

The survey invitation was issued in October 2009 by Dr. F. Renaud, acting interim Director of the UNU's Institute for the Environment and Human Security. The on-line survey, posted on surveygizmo.com, was open for 3 weeks. An invitation reminder was sent to a minimum of 715 addresses on days 8, 16, and 20. Ultimately, 197

Fig. 1 Distribution of P-set subjects (survey respondents)

experts fully completed the survey, equalling 49 % of those who visited the site ($n = 396$) and 64 % of those who started the survey ($n = 306$). Based on geographical positioning data from each computer used to complete the survey, the results included perspectives from 49 countries and six continents. It is evident that, although all continents are represented, the vast majority of respondents were from the United States and Europe; thus, important contributions may be missing from entire regions (see Fig. 1).

To protect human subjects, profiling information was not required. Experts so desiring were granted anonymity to avoid any link between their identity and controversial global issues. Among the experts who fully completed the survey, roughly one-third chose to remain anonymous—underscoring the politically charged tone and sensitivity of the debate. Profiling information, when provided, included name, title, city and country workspace, email address, institutional affiliation, professional activity, discipline, focus of current work, months specifically spent exploring the environment–mobility interface, gender, date of birth, and highest level of education. Although completely void of statistical validity, this anecdotal information was useful to analyze the resulting factors—discourses—and to find broad commonalities among experts sharing these four major narratives. Among the experts who fully completed the survey, 161 (82 %) contributed at least partial profile information.

RESULTS

Factors

The Q-sorts representing the subjective voices of 197 respondents were processed using factor analysis. Factors were identified and rotated using varimax centroid extraction within the PQ Method software, Ver. 2.11 (Schmolck 2002) and after exploration, based on criteria from Webler[2] et al. (2009), a configuration of four (out of eight possible) factors was chosen to use in the subsequent analysis.

The use of four factors produced a set of loadings for each of the 197 respondents. Among those, 7–17 respondents arbitrarily surfaced per factor, as a "defining sort"—one whose combination of answers statistically captures the main viewpoint or perspective of a given factor. Additional data are provided in On-line Resource 1.

Four Social Perspectives or Discourses

Each factor, or discourse, presents a distinct social perspective on the environment–mobility nexus. The four discourses identified by the current analysis are hereby labelled: the determined humanists, the benevolent pragmatists, the cynical protectionists, and the critical realists.

[2] Webler's criteria for choice of factors are simplicity, clarity, distinctness, and stability.

Below, the most important statements (out of the 42 sorted) for each factor are woven together to describe the discourse; the bracketed numbers in each discourse identify the specific statement(s) from which the discourse's narrative is partially derived. Distinguishing statements were determined when satisfying at least one of two criteria: (1) significant difference when compared across factors ($p < 0.05$ designated by * and $p < 0.01$ by **) or (2) high salience for experts compared with the other 41 statements (z score $\geq \pm 4$). High-ranking experts for each discourse are referred to as *coalition* members. Each discourse was verified through post-sort interviews with numerous coalition members. The narratives below (describing each discourse) were shared permitting clarification and slight revisions.

Discourse A: Determined Humanists

There is no doubt that change in the environment triggers human migration. The phenomenon is accelerating and disquieting, the relationship is clear. Although economic factors play a role, environmental drivers are numerous and include degradation, drought, desertification and disaster [Statements 7 and 10, below]. Climate change is a major culprit [33]. In turn, this mobility may also result from conflict [34]. It is important to differentiate drivers, but it is even more crucial to defend the human rights of displaced people (and those they left behind). States have the moral responsibility to help find appropriate and lasting solutions [40 and 42]. Lack of precise definitions, imperfect names, and challenges in isolating drivers are no excuse to delay more insightful research and appropriate action.

The following statements most strongly endorse the perspective of *Determined Humanists* (Discourse A members). Starting with those the factor embraces and followed by those with which the factor disagrees, the idealized score of all four discourses is noted for each statement. As an example, statement [40] below has a different meaning to determined humanists than to the other discourses. Overall, determined humanists ranked this statement as "4" (bold below), showing extreme agreement (on the scale from 4 "extreme agreement" to −4 "extreme disagreement"), while discourses B, C, and D scored it "3", "−4," and "2", respectively.

> [40] Regardless of the plethora of reasons that might force someone to flee their homeland, all displaced people must be, as a basic human right, provided with dignity, and formal attention and protection. (**4** 3 −4 2)
> [42] The longer term dilemma for states and for the world in general is how to accommodate the predicted surge in environmental migrants. This is not merely a logistical or immigration question, it is also a moral one. (*)(**3** 0 0 2)
> [33] The gravest effects of climate change may be those on human migration as millions are uprooted by phenomena such as shoreline erosion, sea level rise/coastal flooding, and agricultural disruption. (**)(**2** −1 0 −1)
> [14] The flow of migration has not increased due to the impairment of the environment; the phenomenon is not unique to modern times, nor should it be a cause for concern. (−**4** −2 −4 −1)
> [7] Although environmental degradation and catastrophe may be important factors in the decision to migrate, and issues of concern in their own right, their conceptualization as a primary cause of forced displacement is unhelpful, unsound intellectually, and unnecessary in practical terms. (**)(−**3** 2 0 −1)
> [10] Environmental change as an agent of population displacement is questionable; economic factors can themselves explain most of displacement. (**)(−**3** −1 −2 −1)
> [34] Environmental change and concomitant population displacement are the consequences of war and insecurity rather than triggers for it. (**)(−**3** 0 −1 −4)

While the majority of experts loading highly (and exclusively) as determined humanists are from academia, NGO personnel are also numerous in this coalition. Although also strictly anecdotal, professional activities comprise mainly research and practice. Coalition members are evenly divided over disciplines; one-third currently focuses on both migration and the environment. Discourse coalition members are highly experienced (the mode is two or more years working on the nexus). Socio-demographic profiles indicate more male members and nearly half are mid-aged. The majority of members currently work in the global "North" (this term applies to the socio-economic rather than the geographic distinction between north and south).

Discourse B: Benevolent Pragmatists

Discourse B maintains that contemporary migration is too entangled and debatable to allow prioritization of one driver over another [1 and 3]. Climate and environmental change are two of a growing number of factors that exacerbate communities' vulnerability. Current knowledge is sufficient to declare that it is inappropriate to simplify the issues and risk developing unhelpful mechanisms of support. As eloquently and succinctly stated by one high-loader in this coalition, "simplistic explanations are comforting and may be politically expedient but are rarely accurate." Whenever environment or climate triggers migration, the scale of the phenomenon has been exaggerated and there is no indication that it will pose greater threat to the "North" than to any other region [27].

Although a significant problem and a major policy challenge, migration is uncertain to be our generation's most pressing concern [29]. Terms and labelling are important; the term "refugee" must not be encumbered with a new dimension or definition [22]. Clearly, the human rights of all people, including the displaced and those left behind, merit respect but careful research and evidence-based policy are paramount for support of these populations. Above all, protection instruments should be carefully developed [39] and we should "not become preoccupied with what can be precisely counted if that is to the detriment of what ultimately counts" [15] (Myers et al. 2007).

Benevolent pragmatists identified the following statements as most influential:

[1] The link between migration and the environment is both contentious and highly complex. (*)(2 **4** 0 3)
[3] The causes of forced migration are so complex and multiple that they cannot be circumscribed solely to environmental reasons. (**)(2 **4** 1 1)
[27] Third-world refugees are increasingly fleeing worn-out lands for the industrialized countries of the North. (**)(−1 −**4** 3 −3)
[29] The number of persons who will flee environmental degradation in the near future is going to increase at a rapid pace, so that the issue of environmental refugees promises to rank as "one of the foremost human crises of our times." (**)(2 −**3** 1 −1)
'[22] It is imperative that the definition of a "refugee" be widened to include all those whose livelihoods are in peril from natural and unnatural hazards. (**)(0 −**3** −1 1)
[39] A new convention should be drafted providing protection for environmentally displaced persons, and creating affirmative obligations for states to work towards preventing environmental displacement in the future. (**)(3 −**1** 0 2)
[15] "Environmental refugees" exist: even if we cannot yet provide the fine statistical details regarding the number of such refugees and the precise factors which cause them to move, it is clear that there is a significant and growing problem. What can be counted should not be emphasized to the detriment of what also counts. (**)(3 −**1** 1 2)

The majority of experts loading highly (and exclusively) as *benevolent pragmatists* are from academia, with a strong presence of UN/Intergovernmental agency staff. Professional activities comprise mainly research and technical/advisory personnel with more policy makers than any other coalition. Expert disciplines are dominated by geography and anthropology/sociology, and the mode focuses on mobility. Discourse coalition members, although experienced, comprise a younger cohort (the mode is <35 years); the majority have terminal academic degrees. The majority of coalition members currently work in the global "North". Demographics are provided strictly as anecdotal descriptors and are not statistically valid.

Discourse C: Cynical Protectionists

The choice of terms for the environmentally mobile is important and environmental refugee is a valid one [18 and 23]. The phenomenon is clearly evident, escalating and linked to resource scarcity, drought, and/or desertification [33]. Climate does and will continue to trigger human mobility and states are ill-equipped to foster environments that encourage people to stay home [41]. Most importantly, migrants will increasingly pose economic and perhaps security threats to neighboring and, eventually, "Northern" nations [27 and 28]. A better (quantitative) grasp of the scale of the problem is required to inform policy before investing more in human rights issues [16].

Cynical protectionists are united around the following statements:

[28] Primary security threats to western nations related to climate change arise from the potential demand for humanitarian aid and a likely increase in immigration from neighbor states. (**)(−2 −4 **4** −4)
[27] Third-world refugees are increasingly fleeing worn-out lands for the industrialized countries of the North. (**)(−1 −4 **3** −3)
[16] The likelihood is very strong that a more solid understanding of both past and predicted volumes of environmental migrants (the real scale of the phenomenon) will influence policy. (*)(1 1 **3** 1)
[33] Desertification itself is largely a myth; desertification-induced migration is, therefore, also a myth. Any speculative scenario of mass migration under climate change must be rejected for dryland populations whose main strategies are built on adaptation rather than on resignation. (−4 −1 −**4** −2)
[18] "Environmental refugees" is a valid term for those people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected their quality of life. (*)(1 −3 **3** 1)
[23] With poverty and life on the environmental limits as the main motivating force, it matters little whether the migrants are labelled environmental or economic, refugees, or migrants. (**)(−2 −2 −**3** 0)
[41] Due to the number of factors involved, no climatic or environmental hazards inevitably result in migrations. Even if disasters become more frequent in the future, political efforts and measures of protection will be able

to lessen the need to emigrate, provided that the necessary financial means are made available. (**)(−2 1 **−3** 0)

Based on responses to the post-survey electronic (and purely anecdotal) interviews, *cynical protectionists* have a unique profile. They are cynical likely because of their distrust of immigration. Although half of those loading highly and exclusively on this factor are from academia, one quarter is government officials (with no UN/intergovernmental or private sector respondents). A majority are active researchers while nearly a third consider themselves "practitioners" (the most of all four coalitions). The mode currently focuses on both the migration and the environment (more than any other coalition). Length of expert experience is the same as other coalitions but this group tends to have more female and older members than the others. Members are extremely well educated and a majority comes from the global "North."

Discourse D: Critical Realists

Environmental triggers of human mobility, especially resource scarcity or degradation, are a daily reality for many communities [4]. Such migration, in turn, catalyzes conflict and war [34]. Naming this group "environmental refugees" was an effective strategy to gain attention for the commonplace phenomenon; there is little reason not to widen the definition [17 and 22]. Already a historic reality in rural areas and developing nations, it is uncertain that the phenomenon is increasing and unlikely that, as such, it will threaten western nations (since it generally manifests itself as internal displacement). Knowledge about direct links between climate and mobility is insufficient [2] but those affected are acutely aware that their livelihoods are changing in fundamental ways. Whether able to migrate or not, they perceive the environment as a daily threat [36].

Critical realists identified the following statements as most influential:

[2] Our understanding of the nature and significance of the complex linkages between migration and environmental or climatic change remains very limited. (*)(0 3 −2 **4**)

[4] There is a clear relationship between resource scarcity and people's decisions to leave in search of more propitious opportunities. (**)(2 0 4 **4**)

[17] To alarm public opinion about the menaces endangering the planet's fragile ecosystem, the international community was encouraged by the media to create a new category of refugees: environmental refugees. (*)(−2 0 −3 **1**)

[34] Environmental change and concomitant population displacement are the consequences of war and insecurity rather than triggers for it. (**)(−3 0 −1 **−4**)

[36] Eventual migrants may become adapted to the threat of erosion (or another stressor), and may not perceive it to be an immediate threat to their livelihoods and well-being. (**)(−1 1 2 **−3**)

Anecdotal descriptors suggest that experts loading high and exclusively as *critical realists* are academics, NGO staff (more than any other coalition), and UN/intergovernmental personnel. Most practice research; none are policy makers. One-third are predominately in geography and another third in environmental/ecological disciplines. The environment is the current focus for most and the mode is two or more years of experience in the environment–mobility nexus. Predominately male and nearly one-half in the middle age group (35–50 years), one-third has terminal degrees. A majority are from the "South" (more than any other coalition).

Correlation Between Factors

As evidenced from the description above, standard factor analysis produces orthogonal factors (or, in this context, discourses) that are distinctly different from each other. The greatest correlation is between A: determined humanists and B: benevolent pragmatists ($r = -0.41$) indicating that these two coalitions are more diametrically opposed than any other pair—as agreement mounts in A, disagreement for the same statement increases in B. A: determined humanists and C: cynical protectionists are the most unrelated ($r = -0.06$).

DISCUSSION

Cross-Factor Comparisons

There are important and nuanced differences between each of the discourse coalitions—one implicit in the qualifications added to the name of each. The humanists in this study are more *determined* to evoke change than the egalitarians described by O'Riordan and Jordan (1999). Pragmatists have expressed a *benevolent* side that largely transcends the stereotypical individualist. The protectionists' *cynicism* dampens categorical belief in hierarchy. The realists express more *critical* insight and hope than cultural theory's fatalists.

Most likely, these differences and the unanimous agreement of experts on the importance of the environment–mobility link reflect the increasing importance given to environmental issues by both policy and civil society

Table 2 Consensus and compromise (divergence)

Statements of greatest consensus or divergence	A: determined humanists	B: benevolent pragmatists	C: cynical protectionists	D: critical realists
Drivers				
Consensus Environmental change as an agent of population displacement is questionable; economic factors can themselves explain most of displacement [10]	Strong disagreement	Slight disagreement	Moderate disagreement	Slight disagreement
Divergence Our understanding of the nature and significance of the complex linkages between migration and environmental or climatic change remains very limited [2]	Neutral	Strong agreement	Moderate disagreement	Extreme agreement
Terminology				
Consensus Even if the term "environmental refugee" is legally inaccurate, it is more compelling than the term "environmental migrant" because it evokes a sense of global responsibility and accountability, as well as a sense of urgency for impending disasters [21]	Neutral	Moderate disagreement	Slight disagreement	Neutral
Divergence "Environmental refugees" is a valid term for those people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected their quality of life [18]	Slight agreement	Strong disagreement	Strong agreement	Slight agreement
Political elements				
Consensus The most vulnerable within the environment–mobility nexus are those unable to migrate—the forgotten poor obliged to remain behind despite harshly deteriorating conditions and precarious livelihoods [30]	Extreme agreement	Moderate agreement	Slight agreement	Strong agreement
Divergence Primary security threats to western nations related to climate change arise from the potential demand for humanitarian aid and a likely increase in immigration from neighbor states [28]	Moderate disagreement	Extreme disagreement	Extreme agreement	Extreme disagreement
Quantification				
Consensus The likelihood is very strong that a more solid understanding of both past and predicted volumes of environmental migrants (the real scale of the phenomenon) will influence policy [16]	Slight agreement	Slight agreement	Strong agreement	Slight agreement
Divergence Without a firm (and unlikely) definition of who is an 'environmental refugee', it is not easy to say that this category of people is increasing [13]	Slight disagreement	Moderate agreement	Moderate agreement	Strong agreement

(Saunders 2000) within post-modern neo-politics. This new sense of global participation seeking harmony with the environment has resulted in changed perspectives in societies around the globe. Elites from the global South (Peritore and Galve-Peritore 2000), as well as from more developed countries, are increasingly well informed and keenly interested in sustainable environments and secure homelands.

Consensus and Compromise

Using the statements evoking greatest agreement, points of consensus among the four discourse coalitions are discussed below and highlighted in Table 2. Where divergence is extreme, coalitions should either agree to disagree or propose a compromise solution, for adequate policy responses to be developed.

Consensus

The general lack of widespread consensus on the vast majority of statements in this study underscores stark complexity in the field: *complex issues complicated by complexly varying discourses*.

Nearly half of the statements ($n = 18$ out of 42) elicited the *same sign* from all four coalitions. This signifies that, in these cases, the difference among coalitions is only one of scale. Although differences may still be significant (e.g.,

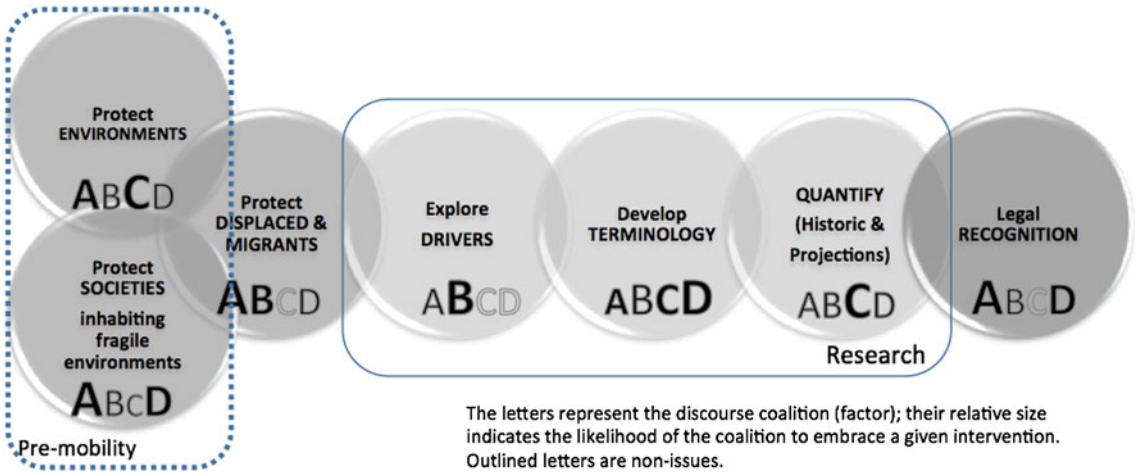

Fig. 2 Opportunities to intervene within EIM

between +4 and +1) on the paraphrased statements below, all four coalitions *agree* to varying degrees that:

- There is a link between the environment and human mobility. [10]
- There is more than one driver of nearly all migration events. [3]
- The EIM phenomenon is growing. [14]
- A better understanding of the numbers (scale of the phenomenon) is likely to influence policy. [16]
- Although research priorities currently stress those who migrate, the most vulnerable are those unable to leave fragile environments. [30]

Only the last two of the above statements are derived from true "consensus statements";[3] both have clear and powerful implications for future scientific and political effort.

Divergence might seem to indicate irresolvable differences of opinion, but where points of disagreement are not particularly strong or ideological, Q-methodology has been used to highlight potential solutions. Areas of divergence should be explored for opportunities and for compromise between coalitions. A major point of divergence concerns the need for new information. Although protectionists (C) do not think information is lacking and humanists (A) are neutral on the issue, the remaining two coalitions strongly believe that the knowledge base needs reinforcing. Aligning this with the agreement statements above, a significant proportion of research should be invested in a stronger evidence-based understanding of dynamics at the site of degrading environments, from which the most vulnerable may never depart.

Furthermore, all discourses except the humanists (A) indicate that the lack of an adequate name and definition of environmentally induced migrants is at least part of the problem in determining the true scale of the phenomenon. While humanists and realists are relatively neutral on the term "environmental refugees", pragmatists and protectionists strongly oppose its use. Therefore, a new terminology package capturing the essence of environmentally linked mobility must be developed. Further debates over use of the term "refugee" are not likely to be a justifiable investment.

CONCLUSIONS

The results of this analysis disclose many doors—opportunities to intervene—within the environment–mobility nexus. Seven such opportunities were extracted from the 42 Q-sample statements. The first three involve *protection*: of the environment, of societies inhabiting fragile environments, or of those who are already mobile (the former two *prior* to mobility). The next set of opportunities involves *research*: exploring drivers, developing terminology, and quantifying the phenomenon (historical or projected). The last opportunity is *legal recognition* of those who are mobile. These opportunities are certainly not exhaustive or normative. A recognized opportunity within the comfort zone of one discourse coalition (i.e., quantification) may be adamantly sidelined by another coalition. As power cannot be separated from discourse, the larger, more vocal, or better funded the coalition, the more likely it is that their respective opportunities are known and accepted, or that resulting stalemates are condoned.

[3] A consensus statement is one that agrees across all factors both in sign (i.e., positive [agreement]/negative [disagreement]) and in scale (a divergence of less than one standard error between the highest and lowest scores).

Linking the discourse coalitions A–B–C–D directly to these seven opportunities sheds further light on their potential and may lead to greater compromise. Figure 2 graphically highlights the importance given each opportunity by the size and boldness of the letters under each circle; the larger and darker the letter, the more strongly it is espoused by that particular coalition; letters in outline indicate non-issues for a given coalition. A concise summary follows:

- Determined humanists (A) are quintessential protectors. While aiming for the ultimate goal of legal recognition, they prioritize efforts that protect those inhabiting fragile environments and those already displaced.
- Benevolent pragmatists (B) prioritize explorative research leading to a solid lexicon of drivers of mobility. They will downplay protection until proof of cause is substantiated. An antipode of determined humanists, issues abound.
- Cynical protectionists (C) feel compelled to quantify EIM. Although they agree to contribute to environmental protection (so people may remain in their homelands), recognition and protection of those already mobile would indicate failure.
- Critical realists (D) prioritize opportunities to protect societies that have inhabited fragile environments—perhaps for generations. Terminology and recognition are essential components of their toolbox.

While Q-Methodology cannot ascertain the prevalence of each of the coalitions among the greater universe of interested parties, this analysis establishes that there are at least four different discourses on the environment–mobility nexus. Although each may have an emerging profile, anecdotes indicate that all age groups and education levels, both genders and geographic "poles" are found in each coalition. Visible gaps of NGOs among the protectionists or government personnel among the realists, as mere examples, present interesting qualitative storylines that require further exploration before being statistically valid.

Strong diversity of opinion among coalitions is one explanation for lack of concrete progress towards better protection for individuals struggling with fragile environments. This readily aligns with a parallel explanation pointing at discursive politics within the United Nations system (McNamara 2007).

Contemporary and unprecedented transformations in our physical world, however, seem to have brought at least these 197 experts, and the four discourse coalitions their voices have created, to a simple and straightforward consensus: *there is a link between the physical environment and human mobility*.

The four discourses on EIM, their respective coalitions analyzed herein and the presentation of opportunities defended by the evidence highlight the urgency of the following efforts:

(1) Agreement on a new package of terminology and definitions that is politically tolerable for the greatest number of actors. It is tempting to assert that so many individual voices and even four discourses can never be reconciled into a single package—or that no such package is needed, that each agency can employ its own terminology. It can be argued, however, that a minimum terminology package (or set of terms that each actor or agency could contextualize) is a prerequisite for quantification of the issues at hand: scientists must recognize the various types of mobility before they count them. It would promote more insightful cross-disciplinary research and field-level efforts. To develop such terminology, it is vital to capitalize on existing packages (e.g., UNU's three layers of environmentally linked mobility, the most formal proposal on the "market" thus far).[4]

(2) Wide support for better information and knowledge creation. Preliminary research on EIM must include the following transdisciplinary efforts:

   - Building on agreed definitions that highlight the main drivers, the best possible evidence over the past hundred years must be assembled to produce a global estimate of the scale and geography of the phenomenon. Despite uncertainty in the estimates, only once the weight of the environment on global human mobility is systematically quantified, proportional to all possible drivers, can projections for 2050 be useful.
   - A toolkit (for both practice and policy) must be developed to sustainably mitigate degradation within the most likely source regions of EIM. Climate change adaptation (CCA) will be a major component of the toolkit.

As evidenced in this research, complexity is the state of the global discourse on EIM. Such complexity is an impediment to moving forward, both on research and policy fronts. There are at least four discourse coalitions with unique vantage points—each seeing EIM with a different shape, depth, and orientation. What is foremost, and most potentially far-reaching, is that each discourse coalition sees EIM at all. To make strides in describing and

[4] Flight from environmental degradation or climate change has many pathways. Three are captured in recent research by Renaud et al. (2011): (1) environmental emergency migrants/displacees who flee the worst of an environmental impact on a permanent or temporary basis; (2) environmentally forced migrants who "have to leave" to avoid the worst of environmental deterioration; (3) environmentally motivated migrants who "may leave" a steadily deteriorating environment in order to pre-empt the worst.

quantifying the phenomenon, experts must agree to disagree on the details while identifying measures that will secure the homelands of those most vulnerable. At the same time, they must keep in mind the multiplicity of drivers of mobility past, present, and projected. With such complexity of drivers in constant flux and producing unpredictable outcomes, we must prepare for surprise. Greater consensus, however, is not a prerequisite for choosing action.

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