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Perceptions of climate change impacts on city life in Shanghai: Through the lens of shared values

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ABSTRACT

Cities worldwide are putting policies in place to combat impacts of climate change, but it has been established that in order to engender public support, the policies need to resonate with local perceptions and values. However, these are notoriously difficult to obtain in an authentic version: local values require some interpretation by the researchers trying to define them, but this modifies them unacceptably. In this work we use a transdisciplinary perspective, by holding fast to the need for well-defined outcomes of perceptions but by obtaining them via a humanities-based process, named *WeValue InSitu*, of tacit-to-explicit crystallization of shared values-in-action. Here we innovate and demonstrate the approach of following that crystallization process immediately with a carefully-designed focus group discussion about climate change impacts on their life in the city. The result is a set of clear articulations with respect to life values, such that nuances and linkages between perceptions and values are retained, and across groups is a saturation and consistency that reflects the city (Shanghai) context. We find a conceptual model emerges for the residents: a) they have surprising awareness of climate change but did not think it's impacts so severe or urgent; b) some impacts concern them but they consider Shanghai to be the best place to live, because of its resources and good governance; c) they consider responsibility to be jointly individual and collective with the government; d) they expect clear and transparent communication from the government for collective action. These research outcomes are significant because there is currently no other efficient method to produce such useful results which are also demonstrably authentic: results which indicate not only future policy pathways but the current situation in detail. As the WeValue InSitu method is already shown to be transferable, this approach should now be systematically applied in comparative studies in different cities to determine its scalability, and to academic fields with similar research gaps such as ecosystem services and urban design.

1. Introduction

Cities now contain the majority of the world's population (United Nations, 2019), and their governments are faced with the pragmatics of increasingly clear challenges from climate change impacts, in terms of heat waves, water system disturbances, flood risks, extreme weather and storm events (Revi et al., 2014), and insecurities in energy, food and water supplies. The decisions made by city governments include tough choices of budget priorities and careful navigation of pathways that may have scientific or policy logic but little public support. The acceptance of climate-related policies hinges on what local people perceive to be important and valuable to their lives; in other words, their values (Corner et al., 2014; O'Brien and Wolf, 2010; Wolf et al., 2013). Values act as a filter through which people interpret information about climate change in various pathways, dynamically interact with their beliefs in climate change, and shape their risk perceptions (Persson et al., 2015). Policy links to local values are thought to be crucial for public engagement in some climate actions (Sethamo et al., 2019). For cities to be considered 'liveable' by local inhabitants, policies need to be designed with knowledge of what 'liveable' means to them, but methods to obtain authentic articulations of localized values and perceptions are reported lacking. Here a transdisciplinary approach is used to first assist groups to 'crystallize' tacit-to-explicit translations of their shared values-in-action, and with that lens respond to questions about climate change

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perceptions, producing a conceptual model that is useful for policy design.

2. Background and theory

Researchers have adopted a variety of value-based approach to explore public perceptions and encourage public engagement on climate change. Several psychology-based values frameworks have been utilized to operationalize and conceptualize the subjective dimension of climate change and how it shapes their climate change perceptions and support for climate change policies. For example, many studies adopt the values framework of Schwartz (1994), which uses two dimensions of self-enhancement and self-transcendence. Fully externally-defined values can be assessed by questionnaires (Minelgaite and Liobikiene, 2021; Poortinga et al., 2011; Punzo et al., 2019; Steynor et al., 2021) which use a Likert-type scale for analysis, and assume the respondents' interpretation of the words is compatible with the academics. The participants are offered only closed value items to respond to, precluding localized interpretations: the approach may thus lack good face validity.

Other value-based approaches emphasize the subjective and intangible dimensions of climate change that are important to individuals and cultures, acknowledging they are hard to assess or measure by objective assessment tools (O'Brien and Wolf, 2010). Wolf et al. (2013) used an approach that designed open questions about what participants value most about their life and community: instead of defining the values in advance, they chose to assign the values labels retrospectively into their own framework, after data collection. While some of the labels were directly mentioned by participants, some were brought in and imposed from the researchers, which weakens the face validity of the results – i.e., the extent to which the participants would agree with the acceptability of the interpretations assigned. Although expert researcher interpretation of qualitative data has its place, this is an example where the authors wanted authentic perceptions; chose a grounded paradigm for data collection (using open questions); but had to compromise in their analysis (externally imposed interpretations).

It is expected to be difficult for participants to articulate their own inner values through direct interviewing, and the alternative in-depth and long-term approaches in ethnography and anthropology involve great amounts of time and thus cost. In the field of Ecosystem Services some innovations to yield authentic perceptions via deep engagement were reported to instead produce significant bias - actually altering local perspectives while trying to capture them (Allen et al., 2021). Where researchers want a disruptive or deliberative discussion that could be useful, but in those studies, and in this one, the goal is to understand local in-situ perceptions, with minimal modification. There is demand by researchers and policy-makers to obtain valid, comprehensive and authentic statements of values from the public, and their links to climate change perceptions, but a pathway to this has not yet been established.

China is a country containing around 20% of the world's population, and with human values which are likely to have significant differences in emphasis than other countries. Yet in China, few studies of perceptions of climate change adopt any kind of values-based approach. Current studies at the macro level are mainly part of the larger cross-national surveys conducted by international organizations in the years before and after 2010, therefore data are quite outdated and typically related to perceptions of international issues (Wang and Zhou, 2020). The China Center for Climate Change (4C) conducted a national survey via telephone, both in 2012 and 2017, investigating public awareness, attitudes of climate change, and intentions to participate in climate policies in both urban and rural areas, which provided a more comprehensive picture (Wang et al., 2017). However, the results from different surveys are significantly different - even contradictory (Yang et al., 2021). At the micro level, there are increasing numbers of small-scale in-depth studies using qualitative methods, but few take "human values" into consideration, and those that do are geographically limited to rural areas that are prone to experience climate change, and to people who are particularly vulnerable. There is a lack of studies in cities, especially mega-cities like Shanghai (Huang et al., 2017; Wang, 2017; Zhou and Yu, 2009). In addition, these previous studies are not rich enough to indicate any mechanisms behind public climate change perception, or policy preferences.

In this paper, the way that people in a Chinese urban area - Shanghai - perceive climate change through the lens of their own local shared values, was explored. This was achieved by taking groups of people with a common background through the WeValue InSitu process, which provided a scaffolding process for them to crystallize or translate their shared tacit, values-in-action, into a concise set of their own explicit statements of what is important to them in their work together. The process also assisted participants to arrange those statements to show the links between them, creating a 'framework' of their shared values, and took 2–3 h for a group of 4–6 people. An illustrative example is shown in Fig. 1. In some studies, these statements have been shown to be so explicit as to be useful as proto-indicators for direct use in decision-making tools such as sustainability assessments (Odii et al., 2020), or self-assessments (Podger et al., 2016). Using the WeValue InSitu process for crystallizing local shared values has been reported in a range of group contexts including civil society, youth, business, educational, and village committee groups in Europe, South America (Podger et al., 2016), United Kingdom (Moreno et al., 2020), Botswana (Sethamo et al., 2020), Nigeria (Odii et al., 2020) and China.

In this work, an innovation was trialed by purposely combining the WeValue InSitu process with a semi-structured focus group of the same participants, focusing on their perceptions of climate change impact, their thoughts on responsive or preventative actions, and on overlaps with their shared values. These were termed, "Perspectives Explorations (PEx)". Because these discussions take place so soon after deep meaning-making of shared values has taken place, they were expected to be deeply anchored. And because the group members had so recently taken part in challenging and negotiating meaning about their shared values (during the WeValue InSitu process), then they were very efficient to similarly stimulate each other in the focus group discussions about climate change impacts. This effect was found incidentally in an earlier study with village committees in Botswana (Sethamo et al., 2020), where the same groups went on to produce exceptional village plans (for climate change adaptations) which were deeply anchored to their shared values, and very efficiently discussed and organized. Post-event interviews demonstrated that this improvement was due to the clarification of shared values before the work on village plans, and the establishment of clear shared vocabulary to articulate related issues. In this work that finding was built upon, and explored the use of a Perspectives Exploration (PEx) focus group discussion about climate change impact perceptions - directly after a WeValue InSitu session - in the expectation of similarly rich and highly-relevant, deeply anchored information being elicited. By repeating this approach with a range of group types in Shanghai, some saturation of values-based perspective elements was obtained which were of use in designing policy elements which will have a better chance of being followed and supported by the public (Wolf et al., 2013).

3. Methodology

Shanghai was chosen as it is known for its progressive and relatively agile municipal policies, and thus it was expected that the residents would more easily engage in expressing opinions about concerns, intentions and perceptions of climate change. It is not a typical Chinese city, but it does usually pilot new initiatives for China as well as having a large population of its own (over 25 million), which suggested that any policy inputs or approach success obtained here would have potential to be scaled up elsewhere. Participant group types were selected so as to seek to obtain a 'saturation' of concepts, and thus to cover four aspects which have potential influence on shaping climate change perception: age, cultural background, and residential property occupancy (Lee et al.,

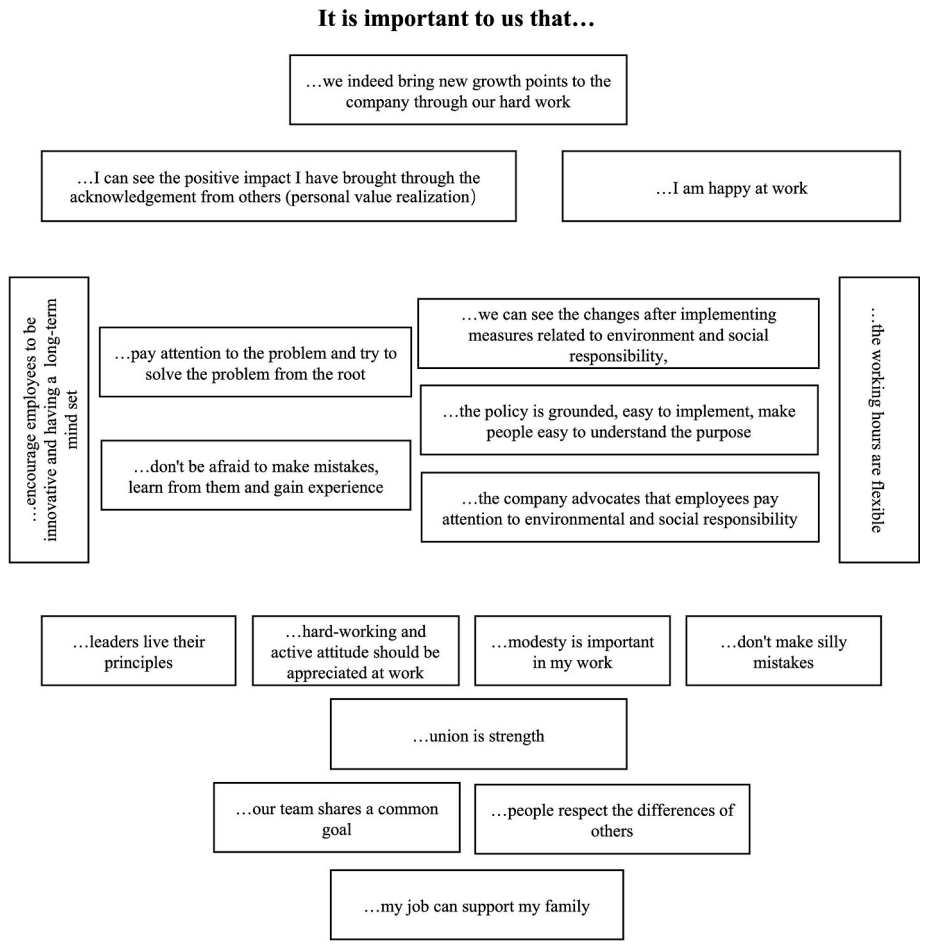

Fig. 1. An illustrative example of a Shared Values Framework produced through the WeValue InSitu process of tacit-to-explicit translation of shared values-in-action, for a work-based group. It is accompanied by a Narrative from the group, which explained that the lower tier represented their 'foundational' values; the top tier their 'aspirations, and the middle tier their pathways.

2015; Poortinga et al., 2019; Wu et al., 2018; Yang et al., 2014). In addition, a consideration of international exposure was added, as residents who have more experience overseas or with regular conversations with people overseas may have a shifted perspective relative to more insular residents. Recruitment was successful for most of the commonly-found group types possessing clear variations of these aspects (see Table 1), but even though the field work was undertaken during a period of only low COVID-2019 exposure conditions in Shanghai during 2020 and 2021, it was not appropriate to gather large numbers of groups for this type of non-essential life activity. There were two further group types that ideally would have been covered, namely the elderly, and the foreigners (although the latter is less than 2% of the city). This research was exploratory in nature, pursuing not representativeness but theoretical saturation. In some cases, a second group of the same context was recruited to allow exploration of variation.

Each group was introduced to the purpose of the research and asked for voluntary informed consent for the session which had approval from the Ethics Committee at University of Brighton. They were then taken through the WeValue InSitu approach (Moreno et al., 2020; Sethamo et al., 2020) which contains first a group contextualization exercise, then photo-elicitation of 'what is important' to individuals in their work of the group; then deeper elicitation with a Trigger List of sentences; then facilitated meaning-making discussions and articulation of new statements of locally shared values-in-action. Finally, participants moved their statements around on a table until they were satisfied with the linkages shown: a framework of their own shared values statements (see example in Fig. 1). This process took 1.5–2.5 h.

It is important to make clear the methodological pathway and purpose of using the WeValue InSitu approach as a precursor to the focus group: it provides a scaffolding mechanism (versus an intervening

Table 1
Key characteristics of the participating groups.

Group # & context type	No. of groups	No. Ptpts with home ownership (yes /* /no)	Approximate age range (y)	Cultural background	Inter-national exposure
1 Work-based group (multi-national)	2	6/0/0	30–50	Chinese	✓
2 Work-based group (enterprise)	1	2/0/1	20–40	Chinese	x
3 Student group (University: Masters)	2	0/6/0	20–30	Chinese	x
4 Researchers group (university)	1	1/4/0	20–35	Chinese	✓
5 Informal social interest group (sharing/ reading)	2	4/0/2	30–50	Chinese	x

* This type of occupation refers to homes with heavily subsidized rents, provided by companies for their employees.

mechanism) to help groups explore, pinpoint, and articulate their own shared values, which raises self-awareness, and consolidates the group viewpoint (Sethamo et al., 2020). The focus group responses are then well-grounded, articulated, and embedded.

The focus group discussions were designed to explore participant's basic perceptions of climate change, its impact on the important aspects of their lives, and their basic responses. The first questions were open questions for warming up the topic (*"As a citizen living in Shanghai, as well as a member of this group, please tell us your first impression when you hear the phrase 'climate change'"*). Then questions for initiating follow-up discussions for free sharing of the topics already brought up: (*"How would/do you respond to climate change impacts you mentioned?"*). If not already mentioned, the facilitator then provided 3–4 examples of potential local scenarios of more severe climate change impacts, asking participants, *"If these kinds of scenarios happen in Shanghai, how would you respond?"* [no clean tap water for drinking (use bottled water instead) and daily use (laundry); power cuts or electricity for air conditioning; extreme humidity with risk of death for those remaining outside)].

Participants were then redirected back to their shared-values frameworks, and asked, *"… how might climate change affect it and to what extent are you concerned with the influences? Under which circumstances would you consider leaving Shanghai?"*

Finally, facilitators asked more deeply about any specific issues participants had already mentioned: *"How would your family be affected by climate change? How would you prioritize the basic supply elements in Shanghai, e.g., food/water/energy/job? What is your attitude of the municipal government and governance of climate change? Are any particular aspects of information disclosure important?"*

The focus group discussions were recorded in audio and transcribed for classical data analysis described below.

4. Results

4.1. Pre-PEX results

The WeValue InSitu process produced shared-values Statements in Frameworks like Fig. 1 for each group. They represent the culmination of the first process for each individual group, leaving them grounded in articulations of their own previously more-tacit, shared, values-in-action – and thus in a very suitable frame of mind to access deep responses to a topic raised by the researcher during the PEX: climate change. (For consistency of reporting, we mention that in other studies these can be synthesized *across* groups to identify major site-specific cultural themes pertinent to those groups. This was not the purpose here, but for completion we can mention the major themes found to be of importance in different parts of society: making contributions to society; having long-term and shared visions; being recognized for one's achievements; solving roots, not symptoms, of problems; people taking responsibility; strength in union and thus tolerance and respect for others; work with sufficient pay and flexibility; trust and open communication.)

4.2. PEX results

All focus group discussion audio recordings were transcribed verbatim, and iteratively open-coded in classical style (Creswell, 2009) by two independent coders, who agreed key themes (Glaser and Strauss, 1967). As the discussions centered on the topic of climate change, the themes elicited from them were specifically on this topic (as opposed to the cultural themes from the Frameworks). As the number of new themes saturated after eight groups, no more were recruited. The emergent themes were aggregated into higher orders, with iteratively-refined boundaries. Sample data for each are given (Table 2).

4.3. The conceptual model

Lastly, a conceptual model was created of residents' perceptions of climate change in Shanghai (Fig. 2). At the base are indicated foundational components of Awareness of CC which were mentioned: specific issues such as extreme weather, and heat islands, alongside levels of Urgency and Relevance.

The participants mentioned some factors that had the potential to affect them so negatively that they might leave Shanghai. These were denoted 'Red Lines' – in the sense that they would cause a serious consequence. These included too much infringement of their food, water or power supplies and significant changes to levels of comfort or convenience in their daily lives. Interestingly, alongside these were threats to the health or education provisions of their children: these were considered serious.

Above this is shown what Attracts residents to stay in Shanghai, and it is noteworthy that this line is well above the 'Red Lines'. In other words, it was rarely mentioned that any CC impacts - even at 'Red Line' level - might drive residents to leave. First, the special status of Shanghai as a 'jewel' of China: obligated to lead nationally in modernization, finance and high-tech growth, but in exchange receiving priority resources compared to other cities. Secondly, the high level of perceived competence of City Leadership and Administration. These jointly signified that Shanghai would always be better than other places to live. And third, the quality of social networks and people-connections was considered very special in Shanghai because the city recruited such forward-thinking people.

Lastly, in the context of their Awareness, 'Red Lines' and Attractions, residents mentioned diverse mitigation and adaptation alternatives - both individual and collective (see Fig. 2). Participants were satisfied with mitigation policies of their companies, and supportive of them taking on more social responsibilities and 'green future' developments - but not at the cost of their own personal long-term careers or development. This is consistent with studies showing that people rely on their company to realize climate responsibility but are not willing to sacrifice their own economic interests (Ruiz et al., 2020). The participants here were firmly unwilling to take pay-cuts, but recommended certain employee benefits like company-organized activities could be cut.

At the individual level, participants expressed intentions to learn and investigate more about climate change impacts. For future adaptation, they were comfortable with having to shift attitudes, and even to sacrifice some living standards, based on their beliefs in the serious consequences of climate change. They even mentioned trying new behaviors, like vegan diets, after watching documentaries. These support that knowledge provision of climate change impacts could promote mitigation and adaptation (Evans et al., 2014).

The participants here expressed interesting attitudes towards government climate policies: not simply to support or oppose, but expecting flexible cooperation. They believed individuals could make a difference, and showed not only a sense of ownership for their own responsibilities but also to sometimes influence others, with specific examples (Table 2). They did not depend solely on government, but did think that CC action benefitted from central and scaled-up government policies, and they had clear expectations of government-organized technology and policy-making, and information that was trustworthy, valid, transparent and sufficient.

4.4. Inputs into urban policy

From the PEX findings, and the Conceptual Model constructed, the following two specific policy elements appear to be considered useful for Shanghai for climate change. They relate to several aspects of perceptions, but contain linking threads are about clarity of information, roles and opportunities to contribute, in a context of ongoing trust, collaboration, and communication between agents:

A. Clear informational content given out by government, on.

Table 2
Themes, sub-themes and sample data (quotes) from the focus group discussions about perspectives of climate change and impacts on participants' life in Shanghai.

Themes	Sub- Themes	Initial Codes (In Vivo)	Sample quotes
Climate change awareness	CC Urgency	urgent	(Talking about rising temperatures and sea levels) "This is a question that seems urgent."
		obvious	"The warming phenomenon is quite obvious, and there is less and less snow"
		aware but not obvious	" … there have been some changes in recent years; … certainly not particularly obvious"
	Relevance	perceived relevance to work	"We have a lot of export trade in our business, so there will definitely be some impact"
		perceived relevance to life	"The most direct example is the daily trip (to work), which (CC will) really directly affect"
		perceived but uncertain about the relevance	"I have some concerns about (climate change), but it does not affect our actual lives" "Although I know that sea levels will rise … I still can't feel it"
		belief of consequence but no relevance perceived	"I believe in [climate change], but I think (extreme situation) is gonna happen in the *distant* future." "I think climate change is an inevitable thing, just a matter of time"
		carbon emissions from meat production	"I've seen some documentaries … that tell us cow farts emit more carbon dioxide emissions than cars."
		carbon neutrality	"I usually buy stocks, and everyone is talking about carbon neutrality … I searched for some information and knew what it means and how it is related to climate change"
		Seasons	" … global warming, it has impacts on every season, like winter is not so cold now, but it comes later than before" "It seems that the seasons are out of order"
		extreme weather	"Some natural disasters may not happen at the expected time … 'extreme weather'"
		glaciers melting	"The icebergs, the glaciers, are melting …
		sea level rising	"The global average temperature will rise by two; the sea level of Shanghai by about 7 m, and one-third will be submerged."
		heat island effect	"The heat island effect …. When you leave Shanghai, you can feel the temperature drop
Red Lines	Basic Supplies	water supply	"At least the water problem must be solved; other difficulties can actually be overcome"
		power supply	"If our basic needs of electricity and water are not met, then everything else is (meaningless)"
		food supply	"(If I have to stay in Shanghai, at the least I must be offered) healthy food, water resources: water is the most critical need"
	Next Generation	health	"If the climate situation has become extremely bad and it affects the physical health of my child, I suppose it would worry me very much, but I'm completely ok with the other impacts"
		education	"When considering the education of their kids, some people may insist on staying in Shanghai, because the impacts on life are less important than children's education."
	Daily life requirements	comfort	

(*continued on next page*)

Table 2 (*continued*)

Themes	Sub- Themes	Initial Codes (In Vivo)	Sample quotes
		convenience	"(If) the temperature is over 40°, then I have to leave Shanghai." "First of all, we must ensure the quality of life" "Convenience and comfort are more (very) important"
Attractions (to stay in Shanghai)	'Privileged City' Resources	infrastructure	"Shanghai definitely has good medical resources" "Some public resources in Shanghai, such as shopping malls and places to have fun, are very attractive to the young"
		transportation	"It's easy to take public transport in Shanghai"
		supply (water, food and power)	"Some large power projects already benefit Shanghai" "The whole Yangtze River Delta is protecting Shanghai"
		Opportunities for personal development	"There are more opportunities for personal development here" "There are more opportunities to realize personal value"
	Competent City Leadership & Administration	emergency management capability	"Shanghai (government) has done a great job every time it faced big crises" "During COVID (2019), I think performance of Shanghai government was very good, and makes people feel they can rely"
		public administration professionality	"I think the urban management system is very professional" " … very appropriate, neither excessive nor inactive: this is the underlying logic of the city"
		citizen before business	"Shanghai gives people a sense of safety/security"
	Inter-personal	Social network	"The more important thing is that I have my whole social network here"
		Emotional connection	"I still won't leave here, because I have personal emotional connections here"
Actions (to cope with climate change)	Collective CC mitigation	supplier supervision	"We have certain requirements of suppliers, including which raw materials they use."
		procurement plan adjustment	"In fact, in terms of our own procurement, … when we go to purchase some types of items, we tend to choose more electrified. For example, forklifts used to be all fuel-powered: we now change to electric forklifts. Yes, of course, the cost will be relatively much higher."
		environmental-friendly work condition	"We also have floor heating and air conditioners for our employees." "In the process of creating the office environment, we also set up a lot of green walls"
		sustainable supply chain	"The company has really paid great attention to environmental protection ….We also actively eliminate the discharge of these chemicals, so our company has really moved in the direction of green future."
	Individual CC mitigation	Green transport	"Drive less and take the subway more often"
		knowledge	"I'm going to learn about (climate change) first, because it's so close to me."
		tree planting	"We can plant trees, flowers and grasses … "
		waste reduction	"Try to order takeaways as little as possible" "I'm trying to use less plastic bags … "
		sustainable consumption	"Use eco-friendly products, more sustainable, reusable and renewable"

(*continued on next page*)

Table 2 (*continued*)

Themes	Sub- Themes	Initial Codes (In Vivo)	Sample quotes
		vegetarian diet	"I tried vegetarian diet for a while"
		waste sorting	"It has been my habit to do waste sorting"
		water cons'n	"Save water"
	Collective adapt'n	industry evolution window seizing	"The window period of industry evolution is actually very short; it depends on whether you have the opportunity to seize it"
		root-based problem-solving	"We also want to solve the problem at the root"
		organizational strategy	"From the perspective of enterprises, they must combine (align/interface) with the policy"
		corporate social responsibility	"At the company level, the company must take on more social responsibility"
	Indi-vid	Modifying living standards	"I can overcome some of my requirements for comfort, to meet changes in the environment"
	Expectations of Governance	information disclosure	"(Information) has to draw my attention, show me more conclusive evidence, and promote extensive discussion"
		technical developments	"Improve the physical structure of the entire grid through technical means to alleviate the problems of power supply difficulties and the unreliable electricity (supply) caused by climate change"
		policy making and implementation	"I'm very supportive of the government to push or gradually push certain decisions."
	Belief in individual initiatives	environmental-friendly practice	" I have continued to practice environment-friendly lifestyle in my life"
		Collective individual commitment	"Individual strength is limited, but what if everyone takes action?"
		publicity and education	" After searching for information, if I can confirm the climate change related scientific problems, I will tell them and convince them that climate change is a real problem"
		ownership	"I love this city: I will face climate change and find my own solution"
		flexible cooperation with government	"Now that the government has initiated (policies), I will definitely cooperate, but I'm not completely dependent on them"

a) the facts of climate change and
b) it's relevance to Shanghai. Including links to a variety of sources for those that wish to look further.

B. Clear communication of the variegated role of different societal members, with examples:

Government: strategy; keeping abreast of helpful technology; investment in necessary infrastructures; facilitation of businesses scaling up on green technologies; preparatory plans outlined for districts, wards and community-level action principles; reassurance of its coordinating capability; reassurance of it's awareness of the Red Lines that residents have (and thus expectations of residents).

Businesses: to identify and document their own impacts and contributions on climate change mitigation and adaptation; to identify pertinent emerging technologies in their domains that they could expand into; to consider their own social responsibilities related to climate change impacts; to welcome and to credit staff who make significant contributions to this issue.

Residents: which individual actions by which types of people would help i) moderately ii) significantly; how they would be expected to respond under different pre-prepared scenario plans by the government.

5. Discussion

This research addressed an emerging topic in sustainability: the importance of localized understanding of values-based perceptions of climate change impacts. Localization is considered necessary: climate change policies must bridge to local shared values before they will be acceptable (*e.g.*, Wolf et al., 2013). Some new approaches have emphasized the subjective and intangible dimensions of climate change that are important to individuals and cultures (O'Brien and Wolf, 2010), but they came up against the challenges known well in other environmental fields: that in trying to document the 'intangible' world of values and perceptions of local people, researchers can significantly influence or distort the social constructs they are trying to capture (Kenter et al., 2011; Allen et al., 2021) or impose external categorization which has low face validity (Harder et al., 2014).

The research approach presented here integrated a transdisciplinary perspective, by holding fast to the need for explicit and well-defined perceptions, but obtaining them via humanities-based processes of tacit-to-explicit translation of shared values-in-action (Odii et al., 2021). Once a local group had crystallized, through the WeValue InSitu process, authentic frameworks of what 'is most important to them', they could more easily articulate views on a range of otherwise more-tacit topics

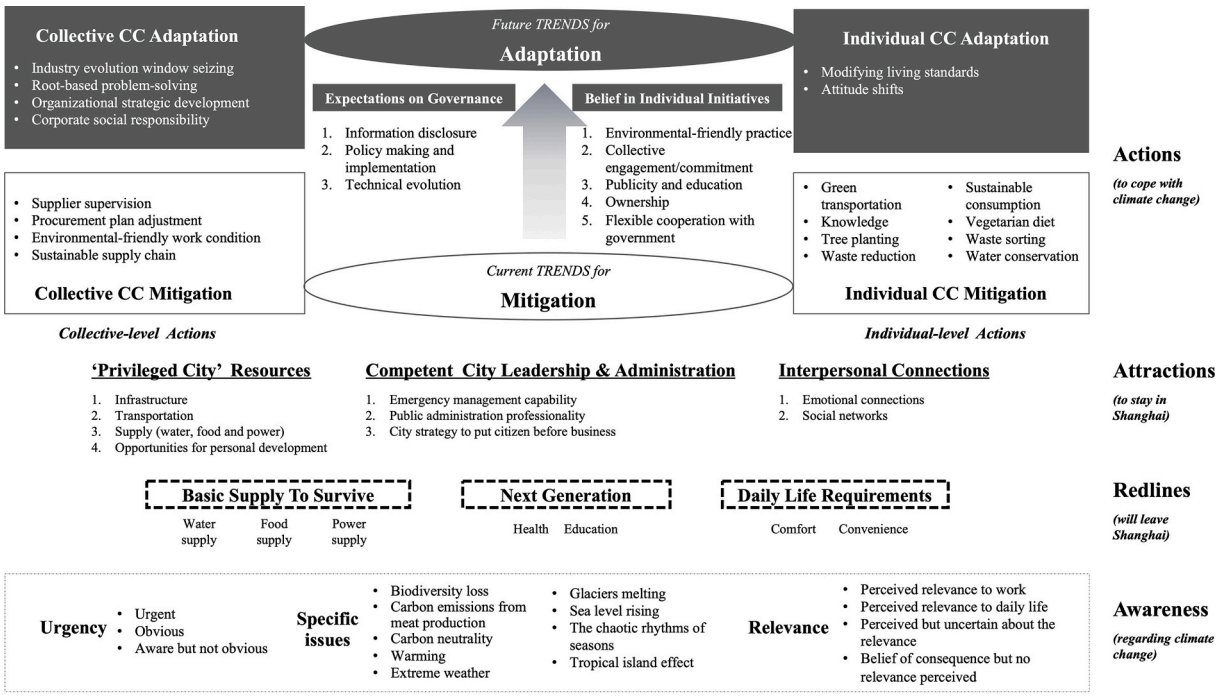

Fig. 2. A conceptual model of residents' perceptions of climate change in Shanghai, comprising themes related to their Awareness, 'Red Lines' and Attractions for living in Shanghai, and related Actions.

such as climate change, and the links of those views to their shared values are traceable in the discussions.

This is very different to current research on public responses to mitigation and adaptation use mainly closed questions about how much they support or oppose related behaviors and policies, for example, using 'willingness to pay' to reduce carbon emissions (Steynor et al., 2021; Wang, 2017; Yang et al., 2014): an approach known to have issues of face validity of results (where participants do not agree with the interpretations of the researchers). The WVIS 'tacit-to-explicit' process produces not simply isolated statements for external classification by keen researchers, but interlinked concepts carrying nuances which make their self-categorization clear. The conceptual model built from those is unique for each place: in Shanghai the participating groups each delivered a bespoke framework of shared values, and discussions of intertwined climate change perspectives, which showed across them a saturation and consistency that reflects the Shanghai context: a) they had surprising awareness but did not think climate change impacts could be so severe or urgent; b) some impacts concerned them but they considered Shanghai to be the best place to live regardless of future challenges, because of its resources and good governance; c) they considered responsibility to be jointly individual and collective with the government; d) they expected clear and transparent communication from the government for collective action.

These research outcomes can enable positive high societal impact and great significance, because there is currently no other efficient method to produce such rich and authentic results with high accountability and face-validity. And the perspectives obtained reveal not only future policy pathways, but the context of the current situation. The method can in principle be reproduced in other places, since the core approach of WeValue InSitu is already established as being transferable (Harder and Burford, 2018). The work reported here involves only one city, thus not providing room for comparisons. The work reported here involves only one city, thus not providing room for comparisons. But an ongoing study in Vienna by the authors shows that the approach can reveal local uniqueness. For example, in 4.4 above it can be identified that the role of central planning in China is firmly embedded in the way that the residents think, both about urban planning and climate change adaptation. Interestingly, they do not see their role to blindly follow central plans, but to also show initiatives at the individual level. On the one hand they expect central administration to lead on infrastructure-based planning, and on the other they expect to have contextual information to guide their actions and decision-making as individuals. In Vienna, however, it is being found the emphasis comes from the residents feeling they must monitor government actions in managing climate change mitigations and adaptations to ensure that they take into account their most deeply held values - especially of social justice. They viewed much of their life through this lens, concerned about balance of provision and equity, to the point of sometimes framing the administration in an 'us and them' manner.

This research article extends in particular the work of Corner et al. (2014); O'Brien and Wolf (2010); Wolf et al. (2013), which have established through several works the need for climate change policies to bridge to local shared values before they will be acceptable to them. Although that need is established, concrete and practical approaches to elicit local shared values have not yet been reported. This aligns with parallel work in Ecosystem Services literature, where a range of participatory and deliberative approaches have been trialed to elicit locally held values of ecosystem services, situated within wider shared values – so far without clear success (Allen et al., 2021): the approach reported here can be applied there.

6. Conclusions

It has previously been established that climate change policies for urban dwellers need to bridge to their local shared values before they will gain support, yet several approaches attempting to elicit authentic and localized values, and associated perceptions, have not yet yielded useful results. In this work the use of the WeValue InSitu method is innovated and demonstrated in combination with a carefully designed focus group discussion about climate change impacts on life in the city. The former is known to provide a scaffolding process which allows groups to crystallize their tacit shared values, and it is found that the subsequent focus groups elicit clear articulations with respect to life values, such that nuances and linkages between perceptions and values

are retained, and across groups is a saturation and consistency that reflects the Shanghai context. It is also found a conceptual model emerges for the residents: a) they have surprising awareness but did not think climate change impacts could be so severe or urgent; b) some impacts concern them but they consider Shanghai to be the best place to live regardless of future challenges, because of its resources and good governance; c) they consider responsibility to be jointly individual and collective with the government; d) they expect clear and transparent communication from the government for collective action. These research outcomes are significant because there is currently no other efficient method to produce authentic and useful results with high accountability and face-validity: results which indicate not only future policy pathways but the current situation in detail. Parallel pragmatic needs exist in ecosystem services and urban design. As the WeValue InSitu method is already known to be transferable, this approach can now be systematically applied in comparative studies in different cities to determine its scalability.

Declaration of competing interest

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

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