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2 **INTEGRATING GLOBAL ENVIRONMENTAL CONCERNS INTO LOCAL**
3 **MANAGEMENT: THE SCALE ARGUMENT AND THE READINESS ARGUMENT**
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16 **ABSTRACT**

17 Due to the growing number of cities and urban residents, cities have increasing contribution to
18 global environmental issues. Many studies pointed out that city administrative level is a crucial and
19 ideal scale to address global issues. Nevertheless, integrating global concerns into local
20 management remains a difficult task for a majority number of cities. Building on existing
21 theoretical and empirical studies, this paper explores the obstacles that impede cities from
22 addressing global environmental concerns, the opportunities of removing the obstacles, and
23 strategies to bring global issues into the local level. The author argues that many of the obstacles
24 are reflections of contradicting perceptions, concerns, interests, and priorities, which are presented
25 in the form of two arguments, namely scale argument and readiness argument, in this paper. The
26 close interlinkages between global and local environmental issues and the potential economic
27 benefits arising from addressing global concerns at the local level may provide opportunities and
28 incentives for cities to take action earlier. The author further argues that while empirical studies 荷
29 in developed cities suggest that the most effective way to get municipal governments to address
30 global concerns is by not talking about the “global”, a too localized policy might not always result
31 in a net gain in a developing city setting.

32
33 **Keywords:** *scale argument, readiness argument, integrating global concerns into local management,*
34 *developing cities, localizing strategy*

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1. INTRODUCTION

The linkage between cities and global environmental concerns, such as greenhouse gas emission, is growing stronger. About half of the world population is urban dwellers, and this figure is projected to grow steadily over the coming decades. The proportion of global environmental impacts of cities is often higher, considering the fact that cities, in general, have a higher level of consumption and that many industrial activities are taking place in cities. In fact, many of today's global environmental issues can be traced back to human activities in cities. In addition, with more and more people living in cities, the magnitude of potential impacts of global change on cities is also growing.

Evidence suggests that the city administrative level is a crucial and ideal scale to address global issues. Cities are often the basic unit for policies that have environmental consequences (both local and global), including policies that shape individual environmental behavior, such as garbage collection, water and sewer treatment, and the pricing of various public services. City managers have great purchasing power as they are making decisions on a daily basis on issues – building infrastructure facilities, choosing and constructing transportation systems, purchasing police, fire and city maintenance vehicles. Some cities own key industries relevant to GHG emission, e.g. power generation and delivery industries, where they can have greater capacity to deliver GHG reduction.

Many studies highlighted the opportunities for local government to play important role in climate policymaking and implementation, either through their direct function or through the ability to mobilize the peoples' support (Newman, 1998; Bai and Imura 2000; Agyman et al, 1998; United Nations, 1992; Collier and Lofstedt, 1997; Rayner and Malone, 1997; Wilbanks and Kates, 1999). For example, the United States has refused to join the Kyoto Protocol and thus the short-term potential for significant reductions in GHG emissions has to come from the local, including state, cities, and corporate entities (Kates and Willbanks, 2003). It is also observed that although cities have limited jurisdictional capacity, they can reinforce and complement the more formal and regulatory actions by their senior-level governments, and thus help national governments to deliver domestic emission reductions (DeAngelo and Harvey, 1998). In a paper examining the scale domains of causes, pressures, state, impacts, and responses of climate change, Wilbanks and Kates (1999) argue that while climate change mainly takes place at the regional to global scale, the causes (fossil fuels, landfills, agriculture, deforestation) and policy responses (mitigation and adaptation) tend to be local. Strategies to bring global concerns into local practices have been discussed largely through empirical analysis of successful cases (Bulkeley, 2000; Betsil,2000; Collier, 1997; Darier, 1999; DeAngelo and Harvey, 1998; Bulkeley and Betsil, 2003), most of which are in developed countries.

Recently, there are encouraging, positive signs on the practical front. For example, ICLEI has worked for more than a decade with cities worldwide through its Urban CO₂ Reduction Campaign,

1 Green Fleets Campaign, and Cities for Climate Protection Campaign (CCP, started in 1995, with
2 over 600 participating cities) to reduce greenhouse gas emissions (ICLEI, 1997a; ICLEI, 2005). In
3 Europe, hundreds of cities joined the Climate Alliance, which aims for a significant reduction in
4 greenhouse gas emissions through actions in various sectors such as energy efficiency,
5 transportation policy, urban planning, waste generation and treatment, etc. However, for the
6 majority of cities in the world, addressing global change does not top their agenda. In addition,
7 most of the encouraging new trends in local commitment and initiatives are confined to developed
8 cities.

9
10 If the potential, necessity and benefits of addressing global concerns at the city level are proven,
11 why it is not happening in the majority of cities worldwide? What impedes cities from addressing
12 global environmental concerns, and where lies the opportunities to remove the obstacles? Is there a
13 good strategy that can maximize the potential and opportunities? Building on the existing empirical
14 and theoretical studies, this paper explores the theoretical aspects of these questions through
15 bringing new dimensions and elements on existing arguments, and adding development perspective
16 into the picture.

17
18 This paper consists of three parts. In the following section, the author presents two arguments that
19 represent the viewpoints of local managers and policy makers: the scale and readiness arguments,
20 which illustrate the underlying obstacles of bringing global issues to the local level. The author
21 argues that many of the obstacles are the a reflection of contradicting perceptions, concerns,
22 interests, and priorities that must be comprehended and addressed in terms of spatial, temporal, and
23 institutional scales, which form the three dimensions within the scale argument. The author further
24 argues that while it is a prevailing understanding that developing cities are not ready to address
25 global concerns as they are often facing much more immediate and acute local challenges, it is not
26 a zero sum game, and that at least some of the developing cities will have to take up global
27 challenges anyway, due to growing external pressures. The second part the paper discusses major
28 opportunities to bring global issues to the local level. The third part of the paper analyzes the
29 potential and limitation of applying successful strategies in developed cities to developing city
30 settings. The author argues that while the developed city experiences suggest that “thinking locally
31 and acting locally” might be the best strategy in addressing global concerns, it might not work as
32 well in developing cities due to a different social, economic and environmental context. The paper
33 concludes by summarizing the findings of the analysis and presenting questions for further
34 research.

35 36 **2. SCALE ARGUMENT AND READINESS ARGUMENT**

37 Despite the necessity, potential, and effectiveness of addressing global issues at the city level, there
38 are obstacles to bringing global issues to the local level. It is important to examine what are the
39 obstacles and where the obstacles stem from, especially from the viewpoint of city managers and
40 policy makers, if the ultimate goal is to promote the integration of the global concerns into the local

1 level management. As the following discussions will reveal, many of the obstacles are the
2 reflections of contradicting perceptions, concerns, interests, and priorities. Two arguments, namely
3 the *scale argument*, and the *readiness argument*, are presented to highlight these underlying
4 contradictions that hamper integration of global concerns into cities. The scale argument tends to be
5 a universal one, while the readiness argument tends to be unique to developing cities.

6 7 **2.1 Scale Argument**

8 The fundamental point in the scale argument is that global environmental issues are simply beyond
9 the reach and concern of local government, and therefore it is difficult to tackle these issues at the
10 local level. As simple and straight forward as this may sound the scale argument encompasses more
11 than spatial scale- it is composed of multiple dimensions and element. There are three dimensions:
12 the *spatial dimension*, *temporal dimension*, and *institutional dimension*, and in each of these
13 dimensions, there are three element- *scale of issues*, *scale of concerns*, and *scale of actions* and
14 *responses*.

15 16 ***Spatial scale: “Not On My Turf”***

17 Climate change, one of the most challenging environmental issues today, is sometimes referred to
18 as global change, which literally implies a strong sense of spatial scale. This sense of “global scale”
19 is further amplified by the predominantly top-down approach of science and politics- the
20 assessment of global climate change patterns and impacts, and the international treaties and
21 negotiations on mitigation. Many cities feel something that is of global nature is beyond their
22 spatial scale of concern, as their primary tasks are dealing with local issues that happen within their
23 administrative boundaries. One of the typical responses from local governments that are not keen in
24 addressing global issues is that global issues are not “on my turf”, and therefore should be left to
25 the national government and international organizations to handle. Even in cities that already
26 started addressing global concerns such as GHG emission, city officials often felt it challenging to
27 make the case at the beginning. The global framing of the issue and policy responses are the most
28 important challenges in bring the global issues to the local level.

29
30 But is global change really global? Fig. 1 shows the scale domains of climate change and the
31 consequences. It can be seen from the figure that although all the five components in the causal
32 linkages are referred to as global change, except the atmospheric concentrations of greenhouse
33 gases and the resulting radiative forcing which are global in scale, the driving forces, impacts and
34 responses are mostly local in nature (Kates and Willbanks, 2003). It is important to note that the
35 causes, impacts and responses are more important aspects than the problem or phenomena itself
36 when it comes to the question of how to tackle the issue.

37
38 The “not on my turf” argument ignores the fact that urban environmental problems, which used to
39 be considered as local problems, are multi-scaled as well (Bai and Imura, 2000; McGranahan et al,
40 2001; Bai, 2002). Table 1 shows the typology of major urban environmental issues and their spatial

1 scale of consequences. It can be seen that while many urban issues are confined within the local
2 scale, many others have regional or even global consequences. It was found that different cities
3 have a different set of predominant issues at a given point of time, and for many developing
4 country cities, the local and immediate issues tend to receive more attention from local officials
5 than the regional and global issues (Bai and Imura, 2000).

6
7 While the issue has spatial extension varying from local to global, the jurisdictional power of local
8 governments is confined within their respective boundaries. Even if cities are willing to tackle the
9 global issues, the *scale mismatch* in urban environmental management presents a major challenge.
10 In addition, the locale of emissions is not always identical to the locale of control over the
11 emissions, and “many local emissions are the result of forces and decisions made in other areas”
12 (Wilbanks and Kates, 1999). In many Asian cities, evidence shows that local actions confined by
13 interests that lies predominantly within jurisdictional boundaries, and the mismatch in spatial and
14 temporal scale is delaying the solution of urban environmental issues beyond the city boundaries
15 (Bai, 2002; Bai, 2005).

16 17 ***Temporal Scale: “Not In My Term”***

18 Global change doesn’t happen overnight, nor does it happen within a couple of years. It is a
19 long-term phenomena. The accumulation of greenhouse gas in the atmosphere has a time frame of
20 more than 200 years. An IPCC report projects the CO₂ emissions from fossil fuel use, deforestation,
21 and cement production for different scenarios up to the year 2100, more than 100 years in the
22 temporal scale (IPCC, 1994). The temporal scale of international negotiations is somewhat shorter-
23 starting in the early 1990s, then the creation of a treaty (Kyoto Protocol) in 1998, and the
24 rectification of the treaty in 2005, and finally, the time horizon of 2012 as the target for the first
25 commitment period- but is still more than twenty years.

26
27 This long-term nature of global change forms a good contrast when compared with that of other
28 issues related to urban environment. The temporal scale of a mayor’s term in office is somewhere
29 between 3-5 years, and even assuming the mayor can serve two consecutive terms, the time frame
30 for a mayor to hold office is typically shorter than 10 years. For developing cities, typical urban
31 environmental issues, such as pollution and sanitation, are an immediate challenge presented to
32 urban dwellers and managers. In a rapidly changing urban context, the global issue is too remote
33 and indirect in the first place for citizens and urban managers to worry about. A typical reaction to
34 global issues can be, why should I have to worry about something that might not happen within my
35 term or even in my lifetime while I am faced with so many immediate challenges and crisis?

36
37 The “not in my term” contention can be counter-argued by the fact that a mayor’s decision often
38 has impacts on a much longer time span, which may exceed his/her term or even lifetime. Figure 2
39 shows the temporal scale of a mayor’s decision-making, with (a) showing the temporal scale for
40 planning and (b) showing the temporal scale of environmental implications. The decision items

1 presented are those that have GHG implications, including public service pricing, solid waste
2 management, transportation planning, utility goods purchasing, industrial development strategy,
3 urban infrastructure development and urban land use planning. It can be seen that in his or her term
4 of office, a mayor makes decisions with a typical planning scale of less than 20 years, while the
5 environmental implications of those decisions are distributed over a varying but significantly longer
6 time span. For example, while the impact of decisions such as public service pricing normally
7 wouldn't exceed a range of 10-20 years, other decisions such as infrastructure development can last
8 for hundreds years, and urban land use planning decisions might have implications for up to a
9 thousand years. Clear recognition of these long-term consequences of decision-making might help
10 local leaders to expand their temporal scale of concern.

11 12 ***Institutional Scale: "Not My Business"***

13 The institutional scale plays an important role in how the global issues can be addressed. There are
14 at least two important institutional factors in addressing GHG emission in cities: the first is the
15 vertical jurisdictional divide between different governmental levels; the second is the relations
16 between the local government and key industries and other stakeholders. According to the
17 definition of Gurr and King (1987), the first one relates to vertical autonomy, which is a function of
18 the city's relationship with senior level government, and the second one relates to horizontal
19 autonomy, which is a function of the city's relationship with local economic and social groups that
20 the city depends on for its financial and political support.

21 22 *Vertical autonomy*

23 City governments are embedded within the governmental jurisdictional scale and therefore, the
24 local government's capacity to take action is constrained by the level of local autonomy. DeAngelo
25 and Harvey (1998) points out that there has been a historical division of powers between local
26 municipalities and high levels of government and that local concerns should be controlled at the
27 local level. According to this division, global issues are not the "business" of local government.
28 However, there has been a two-directional fusion in terms of vertical jurisdictional divide in
29 tackling environmental problems. As stated above, the urban environment consists of a large variety
30 of issues that have spatial scale impacts varying from local to regional and to global (Bai and Imura,
31 2000; McGranahan et al, 2001), and this multi-scale nature of the impacts of local environmental
32 problems has brought more and more upper level government involvement in finding solutions to
33 local problems. For example, most national governments have some sort of regulations that define
34 the local air quality standards, as well as regulations on waste water discharge from cities to water
35 bodies.

36
37 Meanwhile, some cities started to realize the global environmental issues as local problems, and
38 started taking actions towards addressing these global concerns. This direction of fusion, however,
39 is somewhat delayed compared to that of the other direction. The reasons for this delay are twofold:
40 First, it is slow for the international community that formulates the environmental negotiations to

1 realize the importance of local involvement. Second, it is not always encouraged or welcome by
2 upper level government. For example, in Colorado, the state's 1999 appropriations bill forbids the
3 expenditure of any state funds to implement the Kyoto Protocol until the treaty has been rectified
4 by the U.S. Senate (Betsill, 2000).

5 6 *Horizontal autonomy*

7 The scope and options for climate change policy varies greatly according to the varying
8 institutional power of the city over industries. Municipalities that own their own energy industries
9 and distribution networks, like the case of Sweden, have considerably more leverage options than
10 those municipalities without such ownership. In many cases local authorities have little say in the
11 state-owned or privately-owned energy sector and therefore have little influence on its
12 environmental impacts, as long as it is not local air or water pollution issues.

13
14 The influence of local stakeholders on the government's decision-making can be significant. These
15 local stakeholders are highly scale dependent, as they tend to be "composed of people whose
16 concerns and sources of influence have a large local component and are shaped by local
17 interactions and by scale-dependent structures such as the boundaries of political jurisdictions"
18 (Willbanks and Kates, 1999). If these influential social groups regard global concerns as "not my
19 business," local government will have a difficult time justifying it. The Colorado state's
20 appropriations bill of 1999 was influenced by a strong opposition by local industries against any
21 climate-related policies.

22 23 **2. 2 Readiness Argument**

24 When it comes to the case of developing cities, there is another argument against bringing the
25 global issues to the local level- the readiness argument. The argument goes that the developing
26 cities are faced with more urgent and pressing local environmental issues, and that these cities are
27 not ready to deal with global issues in terms of the economic development stage, financial and
28 human capacity, and people's awareness. A typical opposite reaction along this line is: Why bother
29 with the global issue when people are dying from local environmental problems such as bad
30 sanitation and pollution? How do we justify it?

31
32 If the question is whether the cities in developing countries are ready to tackle global issues or not,
33 the answer is most likely "No". In a study conducted by the Urban Environmental Management
34 Project at the Institute for Global Environmental Strategies, it was found that the most pressing
35 environmental issues in case study cities are either poverty-related issues, such as sanitation and
36 clean drinking water, or, local air and water pollution and waste management (Bai and Imura, 2000;
37 Bai, 2001). Likewise, the issues on the top of the local environmental agenda in these cities are
38 always tackling local pollution and providing public services¹. There are also studies claiming that

¹ From meetings and discussions held with local officials during field surveys to case study cities in

1 in developing cities, the human capacity in the local environmental bureau is not sufficient, and
2 public awareness on issues beyond immediate threats is often low.

3
4 The financial capacity of the local government to tackle environmental issues as a whole is often
5 limited in developing cities. City governments in developing countries often operate with budgets
6 that are a fraction of the budgets of cities in developed countries. Within this limited budget, a
7 single task of solid waste collection can take up to half of the total in developing cities, while this
8 ratio is typically lower than five percent in developed cities. This indicates fewer financial
9 resources available for the developing cities to tackle global issues, even if they are willing to do
10 so.

11
12 All of the evidence listed above leads to the conclusion that for developing cities, it is premature to
13 talk about global issues. However, the reality is that cities in developing countries will have to
14 tackle the global issues anyway, and perhaps will have to do so very soon, regardless of the degree
15 of readiness on their part. There are several reasons for this: First, the fact that the most pressing
16 environmental issues in developing cities are local issues does not necessarily mean that CO₂
17 emissions in these cities are low and negligible. The CO₂ emissions from cities such as Beijing,
18 Shanghai and Bangkok are increasing sharply due to rapid motorization and improving living
19 standard (Dhakal, 2005), and a comparison among New York and Asian cities shows the CO₂
20 emission in Asian cities has risen at a much faster rate than in American cities (Marcotullio, 2004).
21 In a study relating the economic development stage and urban environmental issues in Asia, Bai
22 and Imura found that environmental issues facing today's developing cities are complex in nature,
23 as poverty-related issues, industrial-pollution related issues, and consumption and lifestyle-related
24 issues are manifesting themselves in a compressed manner (Bai and Imura, 2000; Bai, 2001). This
25 means these cities might not be able to enjoy the luxury of handling only one type of environmental
26 issue at a time and shift to another after solving it, which is a typical pattern experienced by
27 developed cities (Douglas, 2003).

28
29 Second, the role of strong external pressures, such as the increasing pressure towards the
30 integration of developing countries into an international GHG emission control regime, or the
31 resource constraints might act as a driving force for cities to tackle the global issues at an earlier
32 development stage (Bai and Imura, 2000; Bai, 2003). There is evidence of cities taking up
33 environmental issues at much earlier developmental stages due to external pressures such as
34 resource constraints. For example, China has adopted the concept of a "circular economy" recently,
35 which is about enhancing resource efficiency and promoting the "reduce, reuse, and recycle" of
36 materials. This is only couple of years later than Japan, and Japan's per capita income was twenty
37 times greater than China's when Japan adopted the same approach. The fundamental driving force
38 behind this accelerated adoption of a "circular economy" in China is that the government has

1 recognized that the resource constraints and environmental problems arising from resource
2 consumption have become the bottleneck of the Chinese economy.

3 4 **3. OPPORTUNITIES**

5 Despite all the challenges explored so far, there are opportunities for developing cities to address
6 global issues. The important thing to note is that it might not be a zero sum game. There are two
7 factors that might bring unique opportunities: one is the strong inter-linkages between global and
8 local issues, and the other is the economic benefit arising from addressing global issues at the local
9 level.

10 11 *Interlinkages between global and local issues*

12 Studies show that there is a strong interlinkage between global and local environmental concerns
13 and policies targeted at one end will have benefits at the other end. The GHG reduction effect of
14 local air pollution control measures can be significant (Hu, et al, 2005; Yedla et al, 2005). For
15 example, if clean energy consumption and industrial restructuring measures are taken as part of the
16 air pollution control in Beijing, there will be a reduction of 10.5 million tons of CO₂ emission in
17 2030 (Tsinghua University, 2003. Cited through Hu, 2005). The local environmental benefits, such
18 as air pollution reduction, and associated health benefits, can be one of the most important
19 co-benefits of the GHG reduction policy (STAPPA/ALAPCO, 1999; ICLEI, 2000; Betsill, 2001).
20 An international collaborative research team estimates that the SO₂ emission reduction of GHG
21 reduction policies can be 1-6 million tons (ECON, CICERO and PRCEE. Cited through Hu, 2005).
22 This evidence reveals a promising outlook on the integrated approach in addressing global issues at
23 the local level.

24
25 This strong linkage shows that addressing global and local issues is not a zero sum game but can
26 produce a unique opportunity for developing cities to attain a win-win outcome. It provides a
27 unique opportunity for obtaining financial aid through international and bilateral aiding agencies in
28 addressing local issues if they can be aware and highlight the global benefit of the policy actions. In
29 fact, some cities participating the Cities for Climate Protection program view it not just a climate
30 program, but as an opportunity to tackle the more pressing concerns such as reducing pollution,
31 improving sanitation and basic infrastructure, and eliminating poverty (Yienger et al, 2002). The
32 high international political attention climate change is receiving might act as a pull factor. Climate
33 change-related projects have been receiving higher priority in some international aid agencies, and
34 addressing GHG in tackling local environmental issues makes it easier to be linked to international
35 financial mechanisms such as the CDM.

36 37 *Economic Benefits*

38 One of the common perceptions about addressing global issues in developing cities is that in doing
39 so will bring additional financial burden to the already weak financial situation in these cities.
40 Evidence shows, however, that in addition to the environmental benefits, GHG reduction policies

1 can result in significant economic savings. US CCP member cities reported savings of \$70 million
2 in energy and fuel costs in 1999 (ICLEI, 2000). In 2004, the 147 CCP cities in the US collectively
3 reduced GHG emissions by 23 million tons through efficiency measures, with a cost savings of
4 over \$600 million (ICLEI, 2005b).

5
6 It was also found that many cities implementing GHG reduction policies are doing so without a
7 significant increase in personnel costs. In the case of Tokyo, no additional human resources were
8 brought in when the metropolitan government introduced its GHG reduction policies. In fact, some
9 of the co-benefits the policy generates helped reduce human resources demand in other aspects,
10 which can be used for handling GHG- related policies.²

11
12 In the long run, there might be significant economic benefits for developing countries to tackle the
13 global issues at an earlier development stage, as the cost of achieving a given CO₂ emission
14 reduction can be lower the sooner the policies are in place (Harvey,1993) . Rapidly developing
15 cities with mass construction taking place have more potential of economic gain by adopting the
16 GHG reduction measures earlier. For example, there will be a significant cost savings effect if the
17 energy saving lighting system and building energy efficiency measures can be installed when the
18 infrastructure is build, rather than trying to retrofitting them later.

19 20 **4. STRATEGIES TO LOCALIZE GLOBAL CONCERNS IN PRACTICE**

21 Empirical studies show that the policies addressing global concerns can be more effective if
22 attached to local environmental issues that need to be addressed by the local government anyway.
23 This localizing strategy, however, has its limitations. Especially in a developing country setting, a
24 strategy that is too localized might not always result in net global environmental benefits.

25 26 **4.1 Switching Global Concerns into Local Issues**

27 “Thinking locally, act locally” is found to be a successful strategy of localizing global concerns
28 (Betsill, 2001). In those cities that have GHG emission control measures, city officials have
29 localized the policy of controlling GHG emissions through linking them to with other local
30 environment and development issues, rather than to the problem of climate change. The ICLEI
31 approach is emphasizing the relationship between GHG emissions and other local issues, such as
32 air quality and urban growth. Local officials feel that the idea of climate protection is daunting
33 when it is viewed as a global issue, but the view changes when it is discovered that controlling
34 GHG emissions would contribute to the city’s financial savings, urban planning and design, or
35 improved quality of life (Galluccio, 2000).

36
37 Rayner and Malone (1997) argues the importance of an integrated approach not only within the
38 environmental domain, but cross-cutting other domains such as employment, defence, economic

² Personal communications with Tokyo Metropolitan Government officials.

1 development and public health, which are often more immediate issues than environment.

2
3 While the experiences show the potential of local actions in GHG mitigation, studies reveal
4 problems as well. The strategy of doing it without aiming at it has its own problems. Some are
5 merely repackaging or dressing up some of the existing policies and development as climate change
6 measures (Betsill, 2001; Collier and Lofstedt, 1997). Some of the good practices are cited in a
7 number of different ways, changing the package to serve different purposes. While it is important to
8 recognize the efforts, it is also important to encourage cities to take up new initiatives that can bring
9 additional CO₂ emission reduction.

10
11 The level of autonomy of local authorities over issues that have strong GHG implications varies,
12 and therefore the available policy options and the extent of the potential control over the issue vary
13 too (Collier and Lofstedt, 1997). For example, Swedish local authorities were required to develop
14 their own energy plan in late 1970s, which led to the ownership of energy distribution companies
15 by municipality, and resulted in a considerable savings in both energy consumption and CO₂
16 emissions (Moe, 1991, cited via Collier and Lofstedt, 1997).

17
18 Removing institutional scale barriers is proved effective (but the need to be careful not to imply
19 that municipal ownership of the energy industry is the solution). In Sweden, municipalities have
20 more autonomy over their energy supply chain through the ownership of power generation and
21 distribution companies. These municipality-owned companies serve the interest of their owners and
22 therefore environmental measures are more easily implemented (Collier and Lofstedt, 1997). These
23 companies become active promoters of energy conservation and help customers reduce their energy
24 bills. This help solved the spatial and institutional scale mismatch problem. It is noted that these
25 municipal energy companies are allowed to make a profit, which is then used to cross-subsidize
26 areas within the municipality that have budget deficits, such as public transport services. On the
27 other hand, municipalities in the UK have no control over energy companies, either through
28 ownership or through regulation. Nevertheless, they can promote energy efficiency in public
29 buildings.

30 31 **4.2 Will the “Think Locally, Act Locally” Strategy Work in Developing Cities?**

32 Conventional wisdom on the best strategy of bringing global issues to the local level is “think
33 locally, act locally.” The author argues that the think locally act locally strategy might not always
34 work for cities in developing countries, and that while attaching the global issues to local problems
35 is an excellent strategy, the entire local framing of the issue might be misleading.

36
37 There are empirical examples showing how the “too local” tendency in developing cities can result
38 in improved local issues without significant contribution to the overall global concerns, and in
39 some cases, can even act contrarily. As part of the local air pollution control measures in some
40 coastal cities in China, vehicles that do not meet the local emission standards are tagged and

1 banned from the city. An estimated 300,000 vehicles in Beijing are tagged yellow. Many of the old,
2 yellow tagged vehicles that are prohibited in Beijing (Shenzhen) are auctioned, some by the
3 government, which are purchased by citizens in other cities. Although this significantly mitigate
4 local air pollution, it doesn't reduce GHG as a whole, as the old vehicles are not disappearing and a
5 similar number of new cars will eventually be added. In Ningbo, when the local government
6 banned the use of old vehicles in the city, all the old ones disappeared but reappeared in the
7 neighboring cities and towns.

8
9 The existence of significant urban-rural disparities is one of the central reasons why a too local
10 focus would be problematic in the developing country setting. Cities in developing countries
11 usually enjoy a much higher economic and political status than their rural counterparts, which
12 allows cities to focus on inner-city issues and take the surrounding regions as a "buffer zone".
13 Under these circumstances, an entirely local strategy might result in a strategy of simply pushing
14 problems out of the city. The regional disparities in environmental regulations, in the capacity of
15 monitoring and implementing the existing regulations between cities and their buffer zones, might
16 allow the negative impacts simply to move from the city center to the surrounding regions, without
17 the net benefits to the global scale. Therefore, as far as there are significant regional disparities, it is
18 difficult to expect global benefits purely from focusing on local issues.

19 20 **5. CONCLUDING REMARKS**

21 The discussion on the scale argument reveals that in all three dimensions-the spatial dimension,
22 temporal dimension, and institutional dimension- of scale argument, the main obstacles in bringing
23 the global concerns into the local level are the reflection of contradicting perceptions, concerns,
24 interests, and priorities, rather than the scale of the issue. Therefore, the elimination of these
25 obstacles must start by changing the mindset of the people. Enhancing awareness on the potential,
26 necessity, opportunities and benefits of doing so, as well as the risks and consequences of not doing
27 so, is crucial.

28
29 While the readiness argument in developing cities is justifiable, the increasing international
30 pressures might force some developing cities to start addressing global concerns soon. The
31 recognition of the close inter-linkage between global and local concerns, and the potential
32 economic benefits arising from addressing global issues at an earlier economic development level
33 brings unique opportunities. One of the bottlenecks in materializing the opportunities is the
34 financial mechanism. Linking international funding agencies to local level activities requires effort
35 from both sides: From the funding agency side, the realization of attaching local issues to global
36 problems can have global benefits. From the city's side, understanding the opportunity of solving
37 local problems through the attachment of global issues can be beneficial.

38
39 The majority of existing studies on climate change at local places suggests a strategy of linking the
40 climate issue to more pressing local issues (Betsill, 2001; Rayner and Malone, 1997; Kingdon,

1 1995). Betsill (2000) argues that the most effective way to get municipal governments to mitigate
2 global climate change is by not talking about global environmental change. Rather, the best strategy
3 would be to encourage local governments to “think locally, act locally.” In fact, the most successful
4 experiences in cities in the United States and other developed regions are achieved by
5 implementing this strategy. Ultimately, this seems to be the only feasible strategy in developing
6 cities. The localization of GHG issue requires the existence of local issues that can serve as a hook
7 on which to hang global issues. For developing cities there are plenty of such local “hooks” for
8 local officials to utilize- air pollution control, solid waste management, urban development and
9 growth management, transportation and other infrastructure development, to name a few. In each of
10 these areas, there is potential to link activities to address local issues to global problems.

11
12 However, while reframing the global issues into local issues is a prerequisite, bringing the
13 successful localization strategy to developing cities should be handled with caution. There are cases
14 that “think locally, act locally” may not always work positively in terms of GHG mitigation. As
15 discussed in this paper, under the circumstances that the environmental protection law and
16 monitoring scheme may not be fully installed or functioning in the rural areas, a strategy with a too
17 localized focus might encourage easy fixes to both local and global problems- simply pushing
18 problems farther away. These measures sometimes can significantly reduce the local pollution and
19 GHG emissions, but the reduced GHG is simply dispersed to other regions. The “think locally, act
20 locally” strategy should be implemented together with careful awareness-enhancing and
21 capacity-building efforts to expand the scope of the local official’s horizon of concern beyond the
22 administrative boundary and usual temporal extent.

23
24 There are several remaining questions for further research: (1) It is important to identify and collect
25 empirical cases of successful practices, and to conduct a systematic, critical review of practices in
26 developing cities. (2) Identify under what circumstances and to what extent the localizing policy
27 works in the setting of a developing city. (3) Based on these empirical examples and analysis on
28 what works and why, establish theoretical generalizations to link to the normative question of how
29 to improve the local environmental governance to maximize the potential and opportunities of
30 tackling global concerns at the city level.

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8	
9	

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2

Table 1. Causes and impacts of major types of urban environmental issues

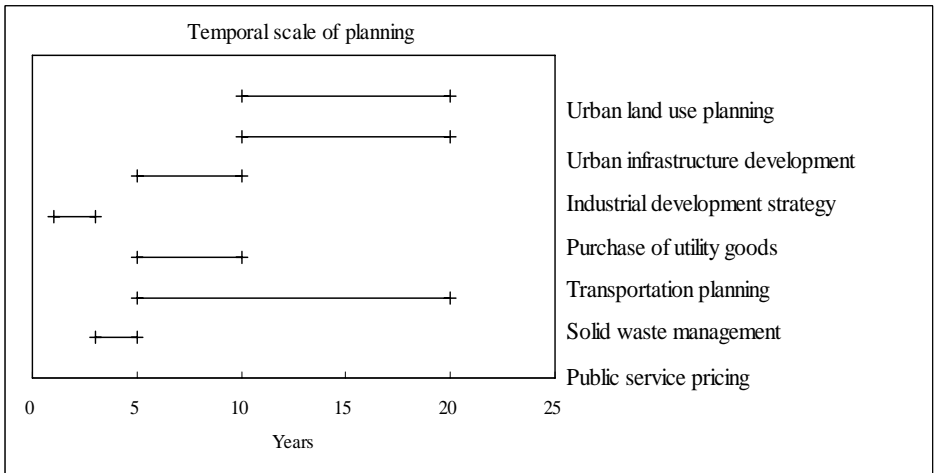
Type	Typical Issues	Causes	Major Impacts	Spatial Extent of Impacts
Type I: Poverty related issues	Low access to safe water, lack of sanitation facilities, organic pollution of water bodies	Low infrastructure, rapid urbanization, income disparity	Sanitation-related health impacts, such as diarrhoea, infections, etc.	local
Type II: Rapid growth related issues	Air pollution (SO _x , particulate etc), water pollution (heavy metallic subjects, BOD, COD) industrial solid waste pollution, etc.	Rapid industrialization, low rate of emission treatment, lack of effective management	typical industrial pollution disaster, Minamata Disease, Onsan Disease; deterioration of regional ecosystem,	local and regional
Type III: Wealthy lifestyle related issues	CO ₂ emission, NO _x concentration, municipal waste, dioxin, etc.	High consumption lifestyle, low local incentive for improvement	Global warming, chemical ingredient and dioxin-caused abnormalities in infants, over-extraction of resources, etc.	regional and global

(Source: Bai and Imura, 2000)

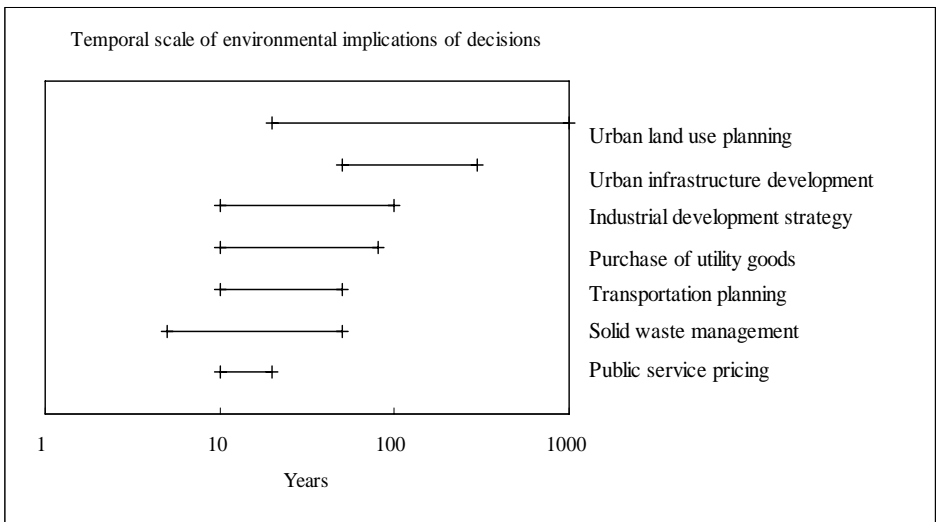
3

Scale domains		Driving forces			Emissions/sink changes				Radiative Forcing			Climate Change				Impacts				Responses		
		Popu- lation	Afflu- ence	Techno- logical Change	Fossil fuels	Agri- culture	Wastes	Defore- station	Trace gases	Aero- sols	Reflec- tivity	Temper- ature	Precip- itation	Extreme events	Eco- systems	Agri- culture	Coasts	Health	Sequest- ration	Preven- tion	Adapta- tion	
Global		█	█					█												█	█	█
Regional	Continental	█		█	█						█											█
	Sub- continental	█		█	█						█											█
	Economic/ political/unions	█	█	█						█	█	█	█									█
Large area	Large Nations	█		█						█	█	█									█	█
	Small Nations, States, Provinces	█	█	█						█	█	█									█	█
Local	Large basins 5-10° grids	█					█			█	█	█		█	█					█		█
	1° grids	█					█			█	█	█		█	█					█		█
	Small basins	█					█			█	█	█		█	█					█		█
	Cities	█	█		█		█			█	█	█		█	█					█		█
	Firms	█			█		█			█	█	█		█	█					█		█
Households	█			█		█			█	█	█		█	█					█		█	

Figure 1. Scale domains of climate change and consequences. (Source: Association of American Geographers Global Change and Local Places Research Group, Global Change in Local Places: Estimating, Understanding, and Reducing Greenhouse Gases. (Cambridge, U.K., Cambridge University Press, 2003)



(a)



(b)

Figure 2. Temporal scale of a mayor's decision making. (a) Temporal scale of planning; (b) Temporal scale of environmental impacts of

