Land Use Policy 42 (2015) 210–226

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

How are climate change concerns addressed by spatial plans? An evaluation framework, and an application to Indian cities

Parveen Kumar [1], Davide Geneletti *

Department of Civil, Environmental and Mechanical Engineering, University of Trento, Via Mesiano, 77, 38123 Trento, Italy

ARTICLE INFO

Article history:
Received 29 October 2013
Received in revised form 14 March 2014
Accepted 26 July 2014

Keywords:
Climate change
Cities
Spatial planning
Urban planning
Evaluation framework

ABSTRACT

Addressing climate change issues require different response actions at various spatial scales. However, the incorporation of climate change issues in the form of agreement, framework and climate policies has tended to focus on international and national scale but lacking at local level. The spatial policies at local level, although not directly linked to climate change, if implemented effectively may become a viable policy instrument to mitigate and adapt to climate change issues. Policy makers at the local level have not explored these local policy options widely. Drawing from the case study in India, this paper aims at understanding how spatial plans in India are incorporating climate change issues and identifying potential gaps. Spatial plans across various cities in India were examined. The skeleton of the review framework is developed upon Moser and Loers (2008) work. To analyze these spatial plans 40 criteria were identified and divided into three components namely awareness, analysis and action. The results of this study show that the roles of spatial plan to integrate climate change issues at the city level in India are still limited. The overall performance of spatial plans shows that they have a low level of awareness, moderate level of analytical capability and limited action response to integrate climate change issues at local level. The result of the study identifies that spatial policies in various cities in India are still limited to physical and economic issues and undermine the issues of climate change. The majority of the sampled spatial plan failed to integrate climate change issues at various fronts of spatial policy process and required to recognize climate change as a critical issue among other issues. Finally the finding of this study creates a platform for discussion and decision making process on the potential aspects where climate change issues can become part of spatial planning policy.

Introduction

Addressing climate change issues requires different response actions at various spatial scales (Preston et al., 2011; Neil Adger et al., 2005). So far these responses have been in the form of international agreements, policy instruments, mitigation and adaptation policies focused especially on the global and national scale (Field et al., 2012; Parry, 2007). However, it has been observed that the majority of policies and action response developed at global and national scale are unfit to act on climate change issues driven and experienced at local scale (Measham et al., 2011; Neil Adger et al., 2005). Climate change is a global concern, but the drivers and effects are felt at regional and local scales. The goals pursued at the higher scales often clash with the problem faced at local scale (Rannow et al., 2010; Urwin and Jordan, 2008). Therefore the issues of climate change should also be analyzed and addressed at the local level.

A few studies from the Europe show that developing effective response actions for climate change at local level may be beyond the capacity of local governments (Wilson, 2006). These observations emphasize the fact that there is a lack of awareness and knowledge on addressing climate change issues at the local scale (Moser and Luers, 2008; Neil Adger et al., 2005), information gap and technical expertise (Wilson, 2006), low level of political support and financial resources (Urwin and Jordan, 2008; Moser and Luers, 2008) and significant disagreement among various stakeholders on climate change issues (Hulme, 2009). According to Wilson (2006) to incorporate climate change response actions at local level, development authorities require detailed information about climate change issues, climate change vulnerability, financial resources, technical expertise and political as well as public participation.

* Corresponding author. Tel.: +39 0461 282685.
E-mail addresses: parveen.kumar@unitn.it (P. Kumar), davide.geneletti@unitn.it, davide.geneletti@ing.unitn.it (D. Geneletti).
[1] Tel.: +39 3427 498715.

http://dx.doi.org/10.1016/j.landusepol.2014.07.016
0264-8377/

Developing effective climate change policies and mainstreaming them into various sectoral, cross sectoral policies is a complex issue (Biesbroek et al., 2009). At local scale, spatial policies have the potential role to effectively act on climate change issues in a number of ways (Biesbroek et al., 2009; Hurlimann and March, 2012). Spatial planning deals with two core aspects. The first one is to foster the community and institutional vision for future socio-ecological development under legal endorsements. The second one is to control land use change and spatial development of the local area through allocation of space for various activities (Hurlimann and March, 2012). For example, spatial plans directly control the physical development of the city by giving permission for various infrastructures like transportation, industries, housing and resource allocations for social and public amenities. It also provides guidance for land-use change that affects ecological aspects in the form of land fragmentation, ecosystem, biodiversity and other natural resources. Thus local-level spatial plans are the basic policy framework that shapes social, economic and physical development of cities and at the same time interaction of these aspects become the main drivers of climate change issues at various scales (Wilson and Piper, 2010). Hence spatial planning has a bigger role to play at the local level to climate change issues as it effects of policy measures on spatial development and it possibly has the potential to act as an effective instrument for climate change adaptation response at local level (Wilson, 2006; Wilson and Piper, 2010).

The goal of this paper is to critically review the incorporation of climate change issues in spatial plans across cities in India, and identify significant gaps and shortcomings. This study can potentially aid local governments to identify key areas where innovative response actions are required to foster a better planning practice in the future.

Study context

The expeditious growth of Indian cities today will result in them being home to more than 1531.4 million of people by 2050 (UN, 2004). The way Indian cities are currently developing its socioeconomic fabric, infrastructure and urban ecology pose qualitatively new challenges. The majority of cities in India are the hub of economic activities and work as a magnet to attract peoples from surrounding regions. The interaction between these factors build significant pressure on natural resources and infrastructure and it contributes to emissions of greenhouse gases. Such city-based growth will have severe impact on changing climate variables resulting in degraded environments and disastrous consequences on human well-being (Ghosh and Chaudhuri, 2012). According to the Maplecroft report (2011), India is the second most vulnerable country to climate change after Bangladesh and their work evaluated vulnerability to climate change across social, economic and environmental factors. They assigned the problem to the degree of poverty, poor health conditions and an agricultural dependent population. India is among the top countries in developing nations for greenhouse gas emission (GHG) (Baumert et al., 2005; Olivier et al., 2012) and it has been predicted that there will be a subsequent increase in the future because of increasing urban and economic growth (Prabhu, 2013). According to Revi (2008), India will have a severe impact due climate change vulnerability than direct hazard exposures. Additionally, about 12% of total geographical area of India is flood prone, while 16% is drought-prone as well as vulnerable to potential climate change-induced shifts in precipitation patterns (Leiserowitz and Thaker, 2011)

Even though India has a scientific presence at various international fronts, it is sluggish in its efforts to streamline mitigation and adaptation response at the national and local level (Revi, 2008). The most immediate issues faced by the country such as decline of natural resources, increase in population, changing physical structure, rapid economic growth and slower changes in the social fabric and complex institutional structures makes it difficult to cope with climate change related issues such as extreme events. Poor and deprived people at various fronts are the one who suffers the most in the extreme climate events (Revi, 2008). Currently India is facing all the major issues like temperature and precipitation variability, drought, flooding, cyclone and storm surges, sea-level rise, and the linked environmental health risk at various spatial scales. This has become a serious public policy and adaptation challenge for India. The national, state and local governments are initiating various spatial and sectoral policies as instruments to brace cities for extreme climate events. However, how far these spatial policies are integrating the core problem of climate change is still a big research question.

The policy context: Indian planning policies process

The central, state and local government are responsible to prepare and implement different aspects of policies in India. The central government lays down policies and priorities of development work with the help of the Planning Commission (Policy preparation institution of the Government of India) and allocates central funds to states for various developmental activities (Commission, 2008, 2011). Then the state and local government prepare development plans for various developmental activities under the purview of 73rd and 74th Amendments of the Indian Constitution (Ansari, 2004). This study focuses on two types of policy documents: spatial plans and city development plans. Spatial plans in India co-ordinated spatially oriented planning in the public sector. It is a long-term policy plans (20–25 years) focussing on spatial-economic development of settlements and cities and it optimizes the spatial distribution of land uses. Whereas the city development plans are short-term plans (7 years) aimed at encouraging reforms for fast track planned development of urban infrastructures, service delivery mechanisms and community participation in the cities. Policy documents differ in terms of content and approach. Spatial plans have a legal support and guides development of cities through regulatory framework such as byelaws and standards for various activities. City development plans on the other hand are seen as a priority action plans for various infrastructure activities and instrument to finance these activities.

In India, historical evidence of spatial planning dates back to the first intensively developed settlements of early civilizations, such as in Mesopotamia, Egypt, China and in India known as the Indus Valley Civilisation (Khan and Lemmen, 2013). The modern planning practices emerged after the European Industrial Revolution. Since then spatial planning practices have been changing as problems emerged from rapid urbanization. Modern planning practices in India find its roots in British rule in the Indian subcontinent between 1858 and 1947 (Mukherjee, 2011). They initiated basic planning practices to seek and protect health and well-being. Under the basic planning provision, they developed sewerage, control of sprawl, location of industry, and the creation of pleasing aesthetic spaces. Recently, policy maker has included environmental protection, public participation and the imperative of sustainable development in spatial planning practices. Current planning practices are inspired from Europe, UK and USA, etc. With time spatial planning practices in India are also adding new layers and frameworks like advocacy planning influenced from Neo-Marxist planners and neo liberal approaches derived from global and free market systems (Nath, 2007).