

Urban Planning Law for Climate Smart Cities



Urban Law Module



UN-HABITAT

LAW AND CLIMATE CHANGE TOOLKIT

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United Nations
Framework Convention on
Climate Change



The Commonwealth

**Urban Planning Law for Climate Smart Cities: Urban Law Module
LAW AND CLIMATE CHANGE TOOLKIT**

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Cover photo

Aerial view of flooding in Pakistan © Water Alternatives Photos

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Foreword

Urban areas represent a major battleground for climate action. Cities account for between 60 and 80 per cent of energy consumption and according to the Sixth Assessment Report (AR6) by the Intergovernmental Panel on Climate Change (IPCC), they generate as much as 72 per cent of human-induced greenhouse gas emissions. At the same time, and quite ironically, urban areas also stand to be severely affected by the negative impacts associated with climate change. Cities are already suffering from extreme weather events, flooding, subsidence, storms, heat waves, water scarcity, droughts, and sea-level rise among other climate change effects. One of the hottest years on record, 2021, closed with Typhoon Odette damaging and destroying nearly 2 million houses in the Philippines - twice as many as Super Typhoon Haiyan in 2013. Considering that over 55 per cent of the world's population live in urban areas as of 2022, and this share is projected to increase to 68 per cent by 2050, cities will play a definitive role in combating climate change and adapting to its effects.

Drawing from the New Urban Agenda, which sets out a shared vision for cities and other human settlements towards strengthened climate action responses and an improved urban environment, UN-Habitat has identified climate change action as one of its priorities. UN-Habitat aims to strengthen climate action and improve urban environments through efforts on reduced greenhouse gas emissions and improved air quality; improved resource efficiency and protection of ecological assets; and effective adaptation of communities and infrastructure to climate change.

Collectively, these three outcomes are intended to spur systemic change by designing integrated solutions that balance the patterns of human life and the built and natural environments in cities.

UN-Habitat has identified "Cities and Climate Change" as one of its top priorities for 2022-2023 which will focus on accelerating the roll-out of the Resilient Settlements for the Urban Poor (RISE UP) Flagship Programme; strengthening local climate finance; enhancing multilevel governance for local climate action; fostering innovation for urban climate action; and promoting climate smart urban basic services. This emphasis on localized climate action has been reaffirmed by the IPCC, which has now expanded its focus on urban areas in its latest report. It has noted that cities can create opportunities to increase resource efficiency and significantly reduce GHG emissions through the systemic transition of infrastructure and urban form through low-emission development pathways towards net-zero emissions. The IPCC has also observed that the global trend of urbanization offers a critical but time-bound opportunity to advance climate-resilient development and that integrated and inclusive planning of urban infrastructure can significantly increase the adaptive capacity of urban and rural settlements.

The IPCC report has indicated that a key prerequisite for effective climate action in urban areas will depend on regulatory and institutional frameworks through which diverse actors interact, and a basis for policy development and implementation.

Hence, this publication is a much needed contribution to achieve effective climate action. The IPCC also notes that climate governance is most effective when it integrates across multiple policy domains, helps realize synergies and minimize trade-offs, and connects national and sub-national policy-making levels as well as ensures close engagement with multiple stakeholders. This recognition of the importance of legal and institutional frameworks mirrors UN-Habitat's position which identifies policy, legislation, and governance as "Drivers of Change." UN-Habitat views this publication as a key contribution to this achieving climate action due to its strong focus on policy, legislation, and governance.

UN-Habitat is pleased to have collaborated with the Commonwealth Secretariat, the United Nations Environment Programme, and the UNFCCC Secretariat in developing the Urban Law Module of the Law and Climate Change Toolkit – an innovative online tool designed to help countries establish legal frameworks necessary for effective domestic implementation of the Paris Agreement – to which this publication is a guide on. It is hoped that this publication, together with the online version of the Toolkit, will be instrumental in fulfilling the potential of urban areas to lead the way and be truly transformative spaces for climate action.



A handwritten signature in black ink, appearing to be 'Maimunah'.

Maimunah Mohd Sharif

Under-Secretary-General and
Executive Director of UN-Habitat

UNFCCC, PARIS AGREEMENT, NDCS AND THE REQUIRED INCREASED AMBITION

UNFCCC Secretariat

Climate change has been described as the 'defining issue of our time'¹ and to adequately address this issue, the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 to support global cooperation efforts seeking to limit the threat of the climate crisis. The UNFCCC came into force in 1994 with near universal membership (197 Parties); its objective was the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2, UNFCCC).

The UNFCCC is the parent treaty to two other treaties: the Kyoto Protocol, which was adopted in 1997 and came into force in 2005, and the Paris Agreement, which was adopted in 2015 and came into force in 2016. The Paris Agreement brings more clarity to the UNFCCC objective by providing a temperature goal of "**well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels**, recognizing that this would significantly reduce the risks and impacts of climate change"² (Article 2 para. 1 (a), Paris Agreement; emphasis added). In addition, the Paris Agreement aims to "[increase] the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development", and to make finance flows consistent with such development (Article 2 para. 1 (b) and (c)).

The Agreement also clarifies that emission reductions are undertaken "in the context of sustainable development and efforts to eradicate poverty" (Article 2 para. 1) and "will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (Article 2 para. 2).

According to the 2021 report compiled by the Intergovernmental Panel on Climate Change (IPCC) on the physical science basis of climate change, a 1.5°C temperature rise will be achieved in 2040, on average, in all of the five scenarios modelled by the IPCC, signaling "code red for humanity" according to United Nations Secretary-General António Guterres.³ However, the report clarifies that the temperature rise can be limited and reduced if ambitious action is taken immediately, with the Secretary-General emphasizing that "there is no time for delay". Thus, the urgency is greater than ever to achieve the objectives of the Paris Agreement.

To that end, the Paris Agreement established an intricate ambition mechanism. Through bottom-up objectives indicated by each Party - the Nationally Determined Contributions (NDCs) - parties must undertake and communicate their efforts to address climate change, and to report on progress over time (Article 3, Paris Agreement).

1 See more at <https://www.un.org/en/global-issues/climate-change>

2 The sixth assessment (AR6) of Working Group 1 of the Intergovernmental Panel on Climate Change. Available at: <https://www.ipcc.ch/report/ar6/wg1/>

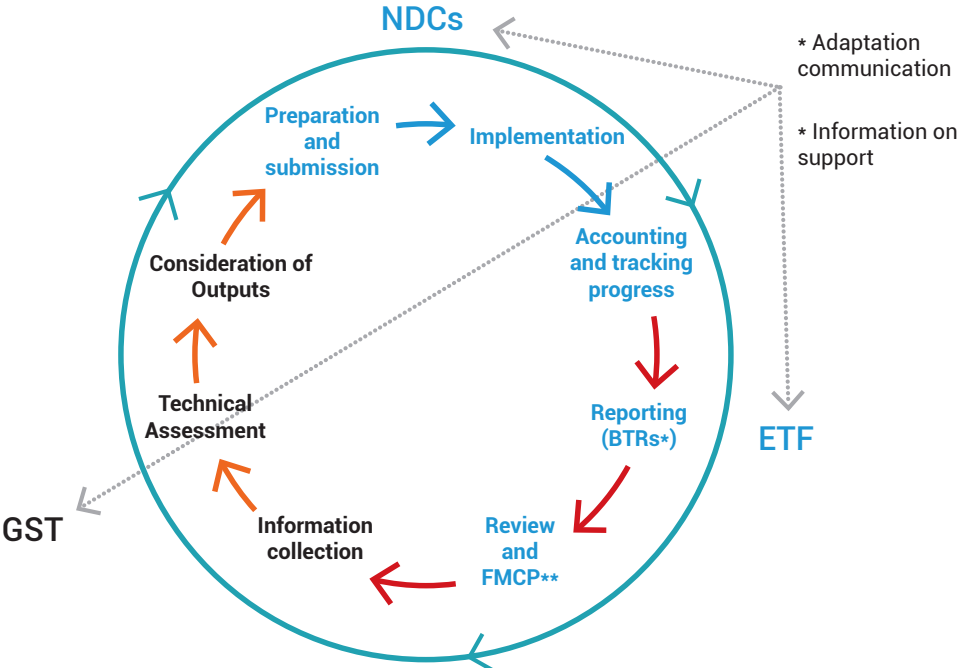
3 Available at: <https://www.un.org/press/en/2021/sgsm20847.doc.htm>

This ambition mechanism has a five-year cycle, in that parties are to present new and strengthened NDCs at the end of each cycle. Parties can also revise and resubmit more ambitious NDCs at any point in time (Article 4 para. 11, Paris Agreement), which is especially important considering the gap between science and the current NDCs. The NDCs, as detailed in Article 4 of the Paris Agreement, are to consider each country's specific national circumstances, "reflecting its common but differentiated responsibilities and respective capabilities", and the "best available science".

NDCs embody efforts by each Party to reduce national greenhouse gas (GHG) emissions and to adapt to the impacts of climate change. They must be elaborated by all Parties and are distinct from the requirements of the Kyoto Protocol which only bound developed country Parties to reduce their emissions.

The NDCs take a variety of forms, including economy-wide and sectoral targets, and while some Parties provide specific targets in their NDCs, others have framed them in broad policy terms. Despite these differences, the NDCs must provide information that is necessary for clarity, transparency and understanding (ICTU), as specified in Article 4 paragraph 8 of the Paris Agreement.

Decision 1/CP.21, with which Parties adopted the Paris Agreement, also required those Parties that had presented their intended NDCs with a time frame up to 2025 to communicate a new NDC in 2020 and every five years thereafter. Parties that had presented intended NDCs with a time frame up to 2030 were similarly requested to communicate or update their NDCs by 2020. The five-year ambition mechanism also includes other steps, which are illustrated in the diagram below⁴:



*BTRs: Biennial transparency reports
 **FMCP: Facilitative, multilateral consideration of progress

⁴ Prepared by the UNFCCC Transparency Division.

According to the NDC Synthesis Report produced by the UNFCCC Secretariat in September 2021,⁵ 164 new or updated NDCs had been presented by 30 July, 2021. In general, the report concluded that most new or updated NDCs had increased ambition and provided economy-wide and clear numerical emission reduction targets and strategies. There were also greater details provided regarding adaptation efforts and their mitigation co-benefits, as well as goals directed at the transition to low-carbon economies. Yet, the implementation of these NDCs would still lead to an average of 16.3 per cent emissions increase from 2010 levels by 2030 even though the IPCC Report Special Report 1.5 specifies these emissions need to be reduced by about 45 per cent from 2010 levels by 2030 to limit the global average temperature rise to 1.5°C.⁶ The implementation of many of the submitted NDCs is also conditional on the availability of financial resources, technology transfer, capacity building and other forms of cooperation.

The Paris Agreement also foresees long-term goals which should be achieved by the second half of this century. These aim at peaking GHG emissions as soon as possible and bringing about rapid reductions, in accordance with the best available science.

The long-term goals, detailed in Articles 2 and 4 paragraph 1 of the Agreement, build on the ratcheting-up of the NDCs and establish guidance on the direction Parties will move towards over time.

To review the efforts taken, build mutual trust and confidence, promote effective implementation and achievement of NDCs, provide information on adaptation⁷, and provide financial, technology transfer and capacity-building support to developing countries,⁸ Article 13 of the Paris Agreement established the Enhanced Transparency Framework (ETF), which built on reporting under the UNFCCC. The efforts reported by Parties undergo a technical expert review (TER),⁹ which identifies advances and areas of improvement. Also, a facilitative, multilateral consideration of progress (FMCP) is undertaken as a Party-led public discussion on the state of implementation of the Paris Agreement in the country,¹⁰ as shown in the diagram above.

In the interest of better analyzing the advances in ambition, including in the implementation of NDCs and additional adaptation and finance efforts, the Paris Agreement also prescribes a global stock take (GST).

5 Available at: https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf

6 Ibid, para. 13. For more information view the Intergovernmental Panel on Climate Change, Special Report 1.5, Summary for Policymakers. Available at: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

7 Parties should provide "information related to climate change impacts and adaptation under Article 7, as appropriate" (Paris Agreement, Article 13 para. 8).

8 "Developed country Parties shall, and other Parties that provide support should, provide information on financial, technology transfer and capacity-building support provided to developing country Parties under Articles 9, 10 and 11" (Paris Agreement, Article 13 para. 9).

9 Paris Agreement, Article 13, para. 11. The TER will be conducted by technical experts with relevant qualifications nominated by Parties and as appropriate, intergovernmental organizations, per Decision 18/CMA.1, para 5. For more information, view Decision 18/CMA.1, Annex.

10 Paris Agreement, Article 13, para. 11. For more information, view the Reference Manual for the Enhanced Transparency Framework under the Paris Agreement, available at: <https://unfccc.int/sites/default/files/resource/ETFReferenceManual.pdf>

In 2023 and every five years thereafter, Parties will take stock of the implementation of the Paris Agreement to assess the progress on achieving its purpose and long-term goals.

To achieve the full and effective implementation of the NDCs and adaptation measures to ensure the success of the Paris Agreement, it is fundamental to have effective and aligned domestic laws and policies.

Beyond the international arena, immediate collective climate action is needed and national, state/regional and municipal/local governments, as well as non-state actors, must cooperate and align policies and efforts to ensure the climate crisis is effectively dealt with. For this reason, domestic legislation, including urban law and policy, is a necessary part of addressing climate change mitigation, adaptation and resilience, and preventing loss and damage, as will be detailed below.

THE LAW AND CLIMATE CHANGE TOOLKIT: AN INTRODUCTION

UNEP

As a pressing global issue, an effective response to climate change requires deliberate and sustained action from both state and non-state actors that is anchored in domestic implementation of the Paris Agreement through nationally determined contributions (NDCs) and the monitoring and reporting of the actions taken. Implementing NDCs requires supportive regulatory and institutional frameworks and a regular assessment of the adequacy and effectiveness of these frameworks. The law performs a crucial role in supporting climate action. Strong comprehensive laws can create legally binding obligations to set GHG emission reduction targets and adaptation goals, create oversight bodies and coordination mechanisms to bring together and clarify responsibilities across levels of government, and lay down obligations to mainstream climate change action into national and sub-national plans. Legislative frameworks may also create specialized funds and budgets, facilitate monitoring and reporting obligations, and integrate important democracy elements such as the right to public participation, access to information and access to justice.

The law also holds several advantages over 'soft mechanisms', including the increased chance of enforceability through incentives and penalties, as well its power to facilitate economic and social change. Considering the way in which NDCs are formulated and the unique circumstances of each country, the need arose for a non-prescriptive tool that allows each user to work within the scope of their country's own needs to obtain results that are tailored specifically for them.

The Law and Climate Change Toolkit is an innovative online tool designed to help countries establish legal frameworks necessary for effective domestic implementation of the Paris Agreement. It is designed for use by government policymakers, officials involved in technical and legal drafting, international organizations and experts engaged in assisting countries to design, review and implement national climate change laws and other laws that impact on climate change action, as well as academic and research institutions. Key features of the Toolkit include functionalities to search existing climate change-related legislation and provisions and to undertake an assessment of a selected country's legislation.

It is comprised of several thematic modules, including dedicated climate laws and governance, energy, agriculture and urban planning, with each module being further broken down into discrete categories directed at allowing users to focus on the areas of law most applicable to their unique circumstances.

The Toolkit is a collaborative effort between the Commonwealth secretariat, the United Nations Environment Programme and the UNFCCC secretariat, working in close cooperation with international organizations, partner countries, academic institutions, development banks and research institutions. Ongoing sector-specific assistance is provided through strategic

partnerships with several specialized entities, including the Food and Agriculture Organization of the United Nations, the United Nations Conference on Trade and Development, the United Nations Human Settlements Programme (UN-Habitat), the United Nations High Commissioner for Refugees and the European Bank on Reconstruction and Development.

Anyone seeking access can register for free to use the Toolkit and is granted full access to all sections of the website. Currently, the website consists of three main functionalities: the Legislation Explorer; the Legal Assessment; and the Assessment Profile. A further functionality, Lessons Learned, will be developed in the future.

KEY FUNCTIONALITIES

LEGISLATION EXPLORER

Built on the foundation of existing legislative databases, the Legislation Explorer allows users to search through dozens of legal instruments that have been uploaded and tagged against carefully chosen legal terms related to climate change and the various thematic modules of the Toolkit. Through the legislation search function, users can search for relevant laws and provisions by way of a free text search or through use of a guided taxonomy that organizes the various categories in a hierarchical classification. To enhance the relevance of information provided by the Toolkit, users are also able to filter results by country, year of the legislation, type of instrument, country emission profiles, population, or cross-cutting categories.

ASSESSMENT PROFILE

The Assessment Profile section provides climate change statistics and information on all countries in the world, and includes information on mitigation and adaptation focus areas.

The assessment profiles for each country, which can be customized for each specific search, further ensure that the results of any search are relevant to the specific circumstances of the country for which the search is being conducted.

LEGAL ASSESSMENT

The Legal Assessment tool is the core feature of the Toolkit and its key innovation. This functionality of the Toolkit is designed to help users identify priority areas for climate law review and potential areas of legislative or regulatory reform. The user can begin assessments by selecting a country from the list found on the opening page of the Legal Assessment tool. Once the user begins an assessment, they can choose any of the thematic modules or subject areas available on the site. These modules include dedicated climate laws and governance, energy, agriculture and urban planning.

The user can then undertake an assessment on all sub-categories within a module or conduct an assessment under any section of a module to suit their needs. The user can also choose which questions to answer under each specific category. Once a user chooses a module and section, they are presented with a cascading series of questions about their domestic legislation that are intended to identify potential gaps in the existing legislative scheme. For each answer given, the Toolkit will either suggest

follow-up questions or will record a gap in the legislative scheme that will be identified at the end of the assessment. Once the assessment is completed, for each gap identified, the Toolkit will suggest exemplary legislation and specific provisions from legislation around the world that may assist in responding to that gap. By providing several examples for each gap, the user is free to assess the style and content of a legal provision that would best suit the needs of a specific country.

GLOBAL EFFECTS AND REAL RESULTS

The Toolkit seeks to have a truly global, solutions-oriented impact, empowering countries to autonomously enhance domestic legislation by assessing existing legislative schemes through a critical lens. In doing so, it aims to help countries put in place the legal frameworks necessary for effective domestic implementation of the Paris Agreement and their NDCs.

By highlighting gaps in legislative frameworks around the world that may hinder action on climate change and then providing users with examples of legislative provisions that were created to accelerate climate action in countries with similar concerns, the Toolkit aims to take a non-prescriptive approach to addressing the legislative needs of each country in relation to climate change-related legislation.

Although continually being updated with new legislation, the Toolkit is already capable of shaping the development of environmental law, both at an early stage in the legislative development process and after legislation has already been adopted and implemented. It is already being used as a diagnostic tool to initiate technical legal assistance to countries around the world in the review and development of their national legislation.

Introduction: The Urban Law Module

UN-Habitat

Urban areas account for two thirds of greenhouse gas emissions and energy consumption, making them major contributors to climate change. Ironically, they also stand to be severely affected by the negative impacts associated with climate change. Cities are already suffering from extreme weather events, flooding, subsidence, storms, heat waves, water scarcity, droughts and sea-level rise, among other climate change effects. Considering that as of 2022 over 55 per cent of the world's population lives in urban areas and this share is projected to increase to 68 per cent by 2050,¹¹ cities are one of the main battlegrounds for climate change action. Indeed, the most vulnerable regions are where urbanization will take place more rapidly.

Of the 2.5 billion people expected to live in cities in the next three decades, 90 per cent of them will be in Asia and Africa. A growing urban population not only makes the prospects of higher emissions real, but it also means that many people will be at heightened risk from the adverse effects of climate change, including millions of informal settlers, whole populations in coastal areas, delta regions and Small Island Developing States, as well as substantial numbers in arid and semi-arid areas.

The role of cities has been recognized by the Paris Agreement, which identifies them as "important stakeholders, capable of mobilizing strong and ambitious climate action".¹²

The New Urban Agenda and the Sendai Framework on Disaster Risk Reduction also put urban areas at the centre of climate change

by including the commitment to promote "international, national, subnational and local climate action, including climate change adaptation and mitigation, and to support the efforts of cities and human settlements, their inhabitants and all local stakeholders to be important implementers", and "mainstreaming of disaster risk assessments into land-use policy development and implementation, including urban planning", respectively. Recognizing the huge potential that cities have to steer growth towards lower GHG emissions and more resilient systems led to UN-Habitat joining UNEP, the UNFCCC secretariat, and the Commonwealth secretariat to develop the **Urban Law Module** of the Law and Climate Change Toolkit.

The way in which cities and human settlements are planned, designed, governed and managed has an impact on their resilience and adaptation to climate change and on their GHG emissions. Urban law has an important role to play in increasing cities' resilience and in helping cities reduce their emissions: it defines urban forms, where land, infrastructure and basic services can be built; lays out rules for planning and decision-making; and sets the context within which urban authorities, local governments and communities are expected to fulfil their mandate and react to emerging challenges.

Law can be used to direct spatial planning and design in a climate friendly direction and promote positive outcomes by directing behaviour towards collectively agreed public objectives.

¹¹ UNDESA (2018). 2018 Revision of World Urbanization Prospects.

¹² Preamble to decision 1/CP.21.

In many countries, the laws, institutions and policies governing urban planning in cities have unintended effects on their capacity to adapt to the changing climate and promote urban forms that increase GHG emissions. The enormous potential of urban and regional planning to improve urban climate resilience is increasingly recognized. The recently adopted Glasgow Climate Pact, signed on 13 November 2021, urges Parties to further integrate adaptation actions into local, national and regional planning.

The pact also explicitly calls for multilevel, cooperative action, and the role of local and regional governments in advancing and implementing the climate goals of the Paris Agreement. This will require a reflection on the adequacy of existing planning frameworks in

promoting climate-friendly urbanization and increasing the resilience of urban population.

Accordingly, this module has a particular emphasis on urban law, and highlights its role in promoting climate-friendly urbanization and increasing the resilience of urban populations and systems while also recognizing that the law may, deliberately or inadvertently, undermine climate change action if not properly designed and implemented. The Urban Law Module is comprised of the following five sections: governance framework for urban and climate planning; urban and territorial planning; urban planning and design for adaptation; urban planning and design for mitigation and economic and non-economic instruments for climate friendly urban planning.

THE COMPANION GUIDE TO THE ONLINE VERSION OF THE TOOLKIT

This companion guide on Urban Planning Law for Climate Smart Cities helps users to navigate through and use the online version of the Toolkit. Its structure replicates the five sections of the online module and, for each section and question, provides a narrative description and examples of legal provisions.

Chapter 1 covers multi-level governance which, in the climate change context, has been defined as the “structural and institutional setting in which different levels of government distribute roles and responsibilities, coordinate and cooperate on climate action as well as the specific instruments that are implemented at different levels of government to support and implement local climate action”.¹³ It focuses on inter-governmental and intra-governmental cooperation built around broad consultative processes and mechanisms for vertical and horizontal cooperation and integration.

It also highlights public participation, data collection and sharing among public agencies, and their dissemination to the public. Furthermore, recognizing that NDCs under the Paris Agreement will need to cascade down and be implemented at the local level, this chapter pays specific attention to the powers of local authorities to ensure climate-friendly urban planning and land use.

Chapter 2 is dedicated to planning instruments and is inspired by the New Urban Agenda (NUA), which calls for the integration of climate-change adaptation and mitigation considerations and measures in urban and territorial development and planning processes. The chapter focuses on planning frameworks exhibited by countries, the most common of which is a three-tiered hierarchy with national, sub-national (regional) and local levels.

¹³ GIZ (2020). Multi-Level Climate Governance Supporting Local Action.

The objective of this chapter is to ensure that planning frameworks at all these levels have mechanisms for integrating climate change, such as through land-use classification and integrated transport and infrastructure networks. It also seeks to promote harmony between territorial plans and climate change plans, as well as coherence between plans at all levels – from the national to the local. The chapter also underscores the need for the plans to consider how their implementation will be affected by climate change in addition to the emission levels associated with them.

Planning for adaptation is comprehensively covered in chapter 3. It is in line with the Paris Agreement, which recognizes that “adaptation is a global challenge faced by all” and is key to “the long-term global response to climate change to protect people, livelihoods and ecosystems”, as well as the Cancun Adaptation Framework¹⁴ and the NUA. The chapter is divided into seven sub-chapters that contain the most important elements for use of the law for successful adaptation in urban contexts. The sub-chapters include climate risks and vulnerability for planned areas and infrastructure, identification and prioritization of adaptation options, and implementation of the identified adaptation options. This chapter recognizes that almost a billion people live in environmentally fragile informal settlements characterized by insecure tenure and limited access to basic services and risk-reducing infrastructure; thus, there is a sub-chapter on the adaptation of informal settlements and other vulnerable settlements. Planned relocations from areas at risk of climate change, security of tenure, and development approval and adaptation are also covered in the chapter.

Chapter 4 is based on the understanding that urban areas account for between 60 and 80 per cent of energy consumption and generate as much as 70 per cent of human-induced GHGs. It recognizes that urban planning has the potential to steer urban development towards low-carbon urban development through advocating for climate-friendly urban forms geared towards reducing vehicular trips and, instead, encouraging the use of non-motorized transport such as walking and cycling. It considers elements such as density, land-use mix, connectivity and accessibility. This chapter also highlights the importance of green spaces for environmental and climate services and the role of legislation in promoting energy saving in buildings. These elements are complemented by a sub-chapter on monitoring and enforcement.

Chapter 5 of the Urban Law Module is on economic instruments. It recognizes that the measures that cities need to undertake, including all those discussed in chapters 1 to 4, require financial resources for successful implementation. Public finance has traditionally formed the bulk of climate finance and requires sufficient consideration, which is addressed by the encouragement of inter-governmental transfers and vesting local governments with a revenue-collection mandate. Nonetheless, the chapter recognizes that most countries lack sufficient public funds to cover the mitigation and adaptation costs associated with climate change, a situation that more acutely affects local governments, especially in developing countries. Accordingly, private finance is also highlighted through a focus on mobilization of investment capital and public-private partnerships. Moreover, behavioural change through incentives and disincentives is highlighted, as these play an influential role in promoting or discouraging specific adaptation and mitigation activities.

14 FCCC/CP/2010/7/Add.1



The Main Street in Cap-Haitien © Alex Proimos, Haiti 2012

1. GOVERNANCE FRAMEWORK FOR URBAN AND CLIMATE PLANNING

Governance refers to the process through which state and non-state actors interact to design and implement policies within a given set of formal and informal rules that shape and are shaped by power.¹⁵ It involves the structures and processes that are designed to ensure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment and broad-based participation. Governance also represents the norms, values and rules of the game through which public affairs are managed in a manner that is transparent, participatory, inclusive and responsive, and sets the parameters under which management and administrative systems will operate.¹⁶ In the climate change context, the magnitude and urgency of the challenge calls for an emphasis on strong and effective governance systems and practices.

This chapter focuses on multi-level governance characterized by intergovernmental – between different levels of government at the national level – and intra-governmental – within the same level of government - cooperation built around broad consultative processes and mechanisms for vertical and horizontal cooperation and integration. Participation by urban stakeholders is also essential to climate governance as are data collection and sharing among public agencies as well as their dissemination to the general public. Furthermore, recognizing that nationally determined contributions (NDCs) under the Paris Agreement will need to cascade down and be implemented at the local level, this section pays specific attention to the powers of local authorities on steering and controlling climate-friendly urban planning and land use.

1.1. MULTI-LEVEL INSTITUTIONAL COORDINATION

Multi-level governance in the climate change context has been defined as the “structural and institutional setting in which different levels of government distribute roles and responsibilities, coordinate and cooperate on climate action, and the specific instruments that are implemented at different levels of government to support and implement local climate action”.¹⁷

For the purposes of this section, the definition is broken down to comprise vertical coordination between governments at various levels as well as horizontal coordination within and amongst governments (and their departments) at the same level.

¹⁵ World Bank (2017). Governance and the Law.

¹⁶ UNESCO. “Concept of Governance”. Available at: <http://www.ibe.unesco.org/en/geqaf/technical-notes/concept-governance>

¹⁷ GIZ (2020). Multi-Level Climate Governance Supporting Local Action.

1.1.1. VERTICAL INTER-INSTITUTIONAL COORDINATION

Urban-related climate change action in countries takes many forms, including the development of relevant policies and legislation (which may be sectoral such as housing, environmental, energy, transport etc.) and mitigation and adaptation plans. Some of these actions precede the Paris Agreement and represent longstanding commitments from these countries under the UNFCCC and the Kyoto Protocol. These domestic measures are, in some countries, reflected in their NDCs while in others they are not. At the same time, there are countries which have submitted their NDCs under the Paris Agreement but have not adequately linked them to implementation actions at the sub-national and local levels. Regardless of the form, however, it is noteworthy that national, regional and local governments play crucial roles in translating internationally expressed commitments into concrete actions.

While international accountability for preparing, communicating and implementing the NDCs is with the national government, the implementation of actions relies on coordinated actions across the various levels of governments. Coherence and coordination of measures between national and sub-national governments is necessary for effective climate actions in urban contexts; this may be promoted through both formal (and institutionalized) measures as well as informal mechanisms that incentivize governments to coordinate their actions. Suggestions include contracts or other formal legal agreements between levels of government, conferences between national and subnational governments and forms of fiscal grants or other financing mechanisms with attached conditionalities.

For example, South Africa's *Spatial Planning and Land Use Management Act 2013* contains a legal requirement for the national government, the provincial governments and municipalities to participate in the planning and land-use management processes that impact on each other to ensure that the plans and programmes are coordinated, consistent and in harmony with each other (Section 12.2.a). In India, the *National Action Plan on Climate Change 2008* promotes vertical coordination between the national government – through the Ministry of Environment and Forests – and the state governments as it requests all states to develop State Action Plans on Climate Change to ensure sub-national implementation of climate change commitments. In Colombia, the *Political Constitution of 1991* establishes the National Planning Council, a consultative body that is part of the National Planning System to discuss the National Development Plan among the national government and representatives of the territorial entities and of the economic, social, ecological, community and cultural sectors (articles 340 and 341). In Mexico, the *General Climate Change Law 2012* provides for coordination between the national and sub-national levels. It requires the country's 32 federal states to develop, conduct and evaluate the state-level climate change policy, implement mitigation and adaptation actions, develop and implement their own climate change programs, and integrate their emission source data into the National Emissions Inventory and the State Risk Atlas. Informal measures may take the form of platforms for policy exchange or performance indicators (Article 38-43).¹⁸

18 UNESCAP (2020). Vertical Integration of Climate Change Policies and Actions in Asia-Pacific Countries.

1.1.2. NATIONAL INTER-INSTITUTIONAL COORDINATION

In addition to vertical coordination, multi-level governance also requires horizontal coordination. Institutions at both the national and sub-national levels need to be able to work collaboratively within and amongst themselves. Institutional arrangements vary among countries, but it is common to find ministries dealing with infrastructure, urban planning, housing, finance, energy, agriculture, transport, land and environment.

In some countries, these areas are dealt with through different ministries while others combine them under one ministry (although even in these cases they could still be under separate departments within the ministry). In both scenarios, national inter-institutional coordination is essential. For instance, transport systems are closely connected to urban planning and land-use practices in that higher availability of motorized transport infrastructure may contribute to urban sprawl and greater emissions. Similarly, housing policies and energy use are linked, as green housing policies may steer buildings towards improved energy efficiency.

These inter-linkages mean that policies in one sector can promote or undermine planned actions in another sector. The need to coordinate is also underscored by the fact that different ministries may make use of different policy and implementation instruments.

Coordination among national-level institutions such as line ministries can be promoted through specific legal provisions requiring collaboration across these ministries, providing financial incentives and establishing soft mechanisms such as policy exchange fora.

In Vietnam, the *Urban Planning Law 2009* mandates ministries and ministerial-level agencies to coordinate with the Ministry of Construction when performing functions related to urban planning (Article 14.3). Similarly, Namibia's *Urban and Regional Planning Act 2018* requires the minister responsible for urban and rural development to consult with other offices, ministries and governmental agencies that perform spatial planning-related functions in developing planning standards (Section 3.3). In Kenya, national inter-institutional coordination is promoted through a "whole of government approach" introduced by the *Climate Change Act 2016*. This creates climate change units in every government ministry and state agency (Section 15) and establishes a high-level climate change council which reports to the president (Section 5). The Colombian *General Environmental Law* (Law 99 of 1993) gives the Ministry of Environment the responsibility to establish the environmental criteria to be incorporated into the formulation of sectoral policies and in the planning processes of other ministries and entities after consultation with these bodies (Article 5).

1.1.3. METROPOLITAN INTER-JURISDICTIONAL COORDINATION

The growth of metropolises is one of the most prominent urbanization trends of this century. A metropolis is defined as a city and its commuting

zone, which consists of suburban, peri-urban and rural areas economically and socially linked to the city.¹⁹

¹⁹ This definition has been proposed by the United Nations Statistical Commission and is endorsed by other UN reports such as the World Urbanization Prospects (UNDESA) and the Global State of Metropolis 2020: Population Data Booklet (UN-Habitat) because it captures the full extent of a city, including the dense areas beyond the municipal boundaries.

Approximately 2.59 billion people were living in metropolises in 2020, which is equivalent to one third of the world's population.²⁰ As local jurisdictions within a metropolis are connected areas with strong territorial interdependencies (ranging from economic, social, and environmental) regardless of administrative boundaries, it is essential that these interdependencies are managed in an integrated way. Urban residents need to access goods and services without jurisdictional constraints, and it must be noted that environmental challenges, including climate change, do not recognize administrative municipal boundaries. These factors call for an emphasis on coordination among local jurisdictions that belong to the same metropolitan area. The legal framework may require municipalities to coordinate planning across municipal borders when it is expedient to do so as has been done by the Norway *Planning and Building Act 2008* (Section 9.1).

1.1.4. URBAN-RURAL COORDINATION

The rationale behind metropolitan inter-jurisdictional coordination also applies to coordination between neighbouring cities and rural areas that are part of the same economic, social or environmental functional areas. Administrative boundaries should not get in the way of constructive collaborations between urban and rural areas where there are sufficient

In Canada, Quebec's *Law C-37.01* establishes the Montreal Metropolitan Community, which is made up of various municipalities listed within the law. It lays out formal mechanisms in which the municipalities falling under the metropolitan area may collaborate, such as through the creation of a council of 28 members comprising of mayors of the municipalities (Section 4). In Colombia, the *Territorial Development Law* (Law 388 of 1997) requires municipalities within the same metropolitan area to coordinate their work under the metropolitan board that they are a part of (Article 24) to ensure that the implementation of their strategies is in harmony with the broader goals of the board. Additionally, the Regime for Metropolitan Areas (Law 1625 of 2013) provides for the possibility of departments of two or more metropolitan areas to jointly organize the provision of public services, the execution of regional works and the fulfilment of their own administrative functions (Article 34).

linkages and there is need for coordinated approaches. For example, Malawi's *Physical Planning Act 2016* calls for the establishment of joint committees where an area earmarked for physical development lies within the boundaries of two or more local government authorities as one of the ways of facilitating urban-rural coordination (Section 19.2).

1.1.5. LOCAL INTER-INSTITUTIONAL COORDINATION

Horizontal coordination should also be carried out at the local level. Line departments such as those dealing with housing, infrastructure, urban planning, environment and natural resources, energy and utilities within local governments need to work in a coordinated and coherent manner for effectiveness.

Several countries have already reflected this need in their legislation. For example, the South Africa *Spatial Planning and Land Use Management Act 2013* provides that a municipal spatial development framework must "provide the spatial expression of the coordination, alignment and integration of sectoral policies of all municipal departments" (Section 21.m).

20 UN-Habitat (2020). Global State of Metropolis 2020: Population Data Booklet.

1.2. PARTICIPATORY GOVERNANCE

Stakeholder participation is a critical component of governance. Involving stakeholders not only increases the quality of proposals and ensures that they respond to the real needs of the people but also improves compliance due to increased buy-in from them. Public participation in environmental decision-making was recognized under Principle 10 of the Rio Declaration. To catalyse and accelerate implementation of Principle 10, governments adopted the Guidelines for the Development of National Legislation on Access to Information, Public Participation and Access to Justice in Environmental Matters (the Bali Guidelines) at the 11th Special Session of UNEP's Governing Council/Global Ministerial in Bali, Indonesia, in 2010. Principle 10 became the subject matter of a legally binding global instrument, the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

(the Aarhus Convention), and a regional agreement (the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (the Escazú Agreement)). Specific to the climate change legal regime, UNFCCC calls for public participation in addressing climate change and developing adequate responses²¹ and the Paris Agreement identifies public participation as one of the elements of enhancing climate actions.²² Accordingly, this section elaborates on the importance of the involvement of stakeholders in urban planning processes. In particular, it focuses on "meaningful" participation, with the understanding that stakeholder involvement should not be a cosmetic exercise merely undertaken to fulfil formal requirements. Instead, public participation should enable residents to actively have their views and needs integrated into the process and reflected in the outcome.

1.2.1. IDENTIFICATION OF STAKEHOLDERS AND COMMUNITIES

For participation to have an impact, there must be a deliberate effort to identify stakeholders and communities whose interests may be either directly or indirectly affected by urban planning and climate change processes. Proper identification is important to the outcome of any consultative process to promote inclusivity and avoid capture by strong interest groups. Urban planning processes should include a mechanism through which relevant stakeholders are identified from the outset as a precursor to discussions that would follow.

Norway offers a good example of a law that requires public authorities to first identify stakeholders and communities in urban planning. The *Planning and Building Act 2008* requires that before urban plans are prepared, there first needs to be a planning programme which gives an account of the purpose of the planning work, how the planning process will be structured, including time limits, the participants and arrangements for public participation, particularly in relation to groups presumed to be particularly affected (Section 4.1).

²¹ Article 6.a.iii

²² Article 12.

In Chile, the *National Action Plan on Climate Change 2017-2022* has provided the basis for the establishment of Regional Committees on Climate Change (CORECCs) which identify regional representatives of ministries, regional

councils and municipalities as well as businesses, citizens, NGOs and academia as key stakeholders in bridging the gap between climate change and regional development plans, regional climate finance and local implementation.²³

1.2.2. OPPORTUNITIES FOR PARTICIPATION

Urban planning processes in most countries include participation by stakeholders. However, the opportunity to participate in a substantial number of these processes is often limited to providing comments after urban plans have already been developed. Stakeholders' involvement in the preparation stage is usually non-existent or severely limited due to lack of avenues for input delivery. Accordingly, participation in such contexts only gives a veneer of public input and, where the same is required by law, fulfils the formal requirements while not actually giving communities and other relevant stakeholders the platform to have their views heard and considered. Inputs from the public are more likely to influence the planning process and the outcome if they are received throughout the entire process rather than at the end as it is relatively more difficult to change urban plans after they have already been developed. Notably, Guideline 8 of the *Bali Guidelines* calls for states to ensure opportunities for early and effective public participation in decision-making related to the environment. To that end, stakeholders should be informed of their opportunities to participate at an early stage in the decision-making process. Guideline 9 goes further and requires states to proactively seek public participation in a transparent and consultative manner, including efforts to ensure that members of the public concerned are given an adequate opportunity to express their views.²⁴

This question thus seeks to assess and, in doing so, encourage participation opportunities to be spread across the planning process - and not simply after urban plans have already been developed - as a way of promoting "meaningful" participation.

For example, the Dominica *Physical Planning Act 2002* provides that before any plan is developed, there should first be a "proposal for the preparation of a development plan" which needs to include proposals for obtaining representations from people likely to be affected by or interested in submitting representations and views on the proposed plan during the course of its preparation; and proposals for the review of the plan by sectoral agencies and private sector representatives (Section 18.2.d). The Act further adds that during the preparation of a development plan and before finally determining its content for submission to the minister, the Physical Planning and Development Authority must ensure that adequate publicity is given in the area to which the plan relates, the matters which it proposes to include in the proposals and that stakeholders are given an adequate opportunity to make representations (Section 10).

²³ GIZ (2018). Multi-Level Climate Governance – Supporting Local Action. Available at: <https://collaborative-climate-action.org/multilevel-climate-governance-supporting-local-action/>

²⁴ UNEP (2015). Putting Rio Principle 10 into Action: An Implementation Guide.

1.2.3. CONSIDERATION OF SPECIFIC COMMUNITY NEEDS

This element goes a step further than the two preceding ones. After stakeholders have been identified and a broader participation platform availed of, the next step is ensuring that specific community needs are considered. That is, that participation is genuinely aimed at addressing stakeholder concerns and not just fulfilling legislative requirements. Furthermore, modes of participation need to be accessible and suitable to the concerned community. For instance, it should be possible for representations to be made in local languages where most of the population

are not conversant with “official” languages. Rwanda's *Regulations on the Content of Urban Planning Documents 2015* offers a good example in that urban planning documents are required to have a background study with a citizens' needs assessment that is conducted through a survey and documented consultative meetings with community, local authorities, the private sector, and other local organizations, including results and recommendations from these meetings (Article 3).

1.2.4. STAKEHOLDERS AND COMMUNITY FEEDBACK

Public participation should influence the priorities and content of urban plans. It must have, as its main aim, the consideration of and response to community needs and priorities. Guideline 11 of the *Bali Guidelines* requires due account to be taken of comments from the public in the decision-making process and that the decisions are made public.²⁵ Indeed, in addition to improving the quality of urban plans, when community views are taken into consideration, adherence with the plans is eased.

Even where views are not reflected in the final outcome, good governance requires that such views are accounted for. The best practice is exhibited where public authorities consider stakeholder and community views and where such are rejected, reasons are provided. The Sweden *Planning and Building Act 2010* mandates municipalities to compile submitted opinions in a special report and account for proposals that may arise from those opinions (Cap 3-Section 17).

1.2.5. ACCESS TO DISPUTE-RESOLUTION MECHANISMS

The nature of urban planning decisions and the diverse range of involved stakeholders, as well as the potential to affect proprietary interests and cultural aspects of life, make disputes very likely. A strong governance system needs to include dispute-resolution and appeal mechanisms for affected people and communities. Most laws related to urban planning and land use often create bodies for these purposes. For instance, the Mauritius *Planning and Development Act 2004* provides for the establishment of a Planning

Appeals Tribunal with jurisdiction over disputes related to development permits (Section 53). In some countries, even people whose interests have not been directly affected are still allowed to file cases provided a breach of planning regulations is present. The *Samoa Planning and Urban Management Act 2004* empowers the Planning and Urban Management Agency or any interested person to bring proceedings in the Supreme Court for an order to remedy or restrain a breach of the Act (Section 83.2).

²⁵ Ibid.

The Colombian *Territorial Development Law* (Law 388 of 1997) provides any person with the right to resort to the judicial authority to enforce compliance with a law or administrative act related to the application of urban planning instruments provided for in the national regulations (Article 116).

This enforcement action has a relevant impact since it allows citizens to obtain the enforcement of a law or an administrative act by the administrative authority allegedly in default.

1.3. DATA COLLECTION AND SHARING

Data collection and sharing is one of the essential ingredients of effective governance as it assists public bodies to make more informed policy decisions. Data sharing is particularly critical to evidence-based governance as it allows the aggregation of data from a wide range of sources at greater quantities which can reveal new correlations and patterns that can help governments to tackle multi-dimensional challenges. It reveals correlations that would otherwise remain invisible and, by readily availing data, reduces searching and processing times which in turn help to speed up decision-making and improvement in efficiency.²⁶

Considering that climate change has the potential to impact almost every sector of a country's domestic policies, coupled with the fact that urban planning and land use have direct effects on energy use, agriculture, transport and waste production, among others, it is vital that data collection and sharing practices are undertaken to promote sectoral integration in the climate change context. These should happen between governments at all levels (vertical data collection and sharing) as well as horizontally among subnational governments (different cities, regions, provinces) and within local government departments and institutions.

Accordingly, this part calls for:

- Vertical data collection and sharing between local, subnational and national levels
- Horizontal data collection and sharing among subnational governments (different cities, regions, provinces)
- Local data collection and sharing among different departments and institutions in the same city.

Norway's Planning and Building Act 2008 requires municipalities to keep an up-to-date, public set of basic map data related to the Act's objectives and obligates central government authorities to make national map data available to all municipalities. Central governments and regional and municipal bodies are required to organize geodata in a way that ensures that the information is readily available for use in processing planning and building applications. The Act also adds that the basic map data must be available for use for other public and private purposes (Section 2.1).

26 Law Commission of England and Wales, "Data Sharing Between Public Bodies: A Consultation Paper" Consultation Paper No 214.

1.4. LOCAL GOVERNMENTS' MANDATE FOR URBAN PLANNING IN URBAN AREAS

The principle of subsidiarity stipulates that authority and resources should be at the level of authority that is closest to the people most affected by decisions to ensure effective, appropriate and cost-effective delivery. In the urban context, the closest level is represented by local governments which perform a variety of functions that may have an impact on climate change mitigation and adaptation. Local governments have unique knowledge of their territories and of the climate challenges affecting them. They are more likely to accurately appreciate the needs and concerns of their local population and it is also more likely that their authority will be accepted as legitimate.

This sub-section proposes that, as the closest level to the people, it is preferable that local governments be vested with the mandate for urban planning. The legal framework should clearly lay out the roles and responsibilities of local governments. To successfully implement their mandates, attention needs to be paid to building the capacities of local authorities. Inter-municipal collaborations beyond administrative boundaries for urban and infrastructure planning is also one of the important elements under this sub-section.

1.4.1. LOCAL GOVERNMENTS' CLEAR INSTITUTIONAL ROLES AND RESPONSIBILITIES

The functions, powers and responsibilities of local governments should be clearly outlined. A clear definition is one that sets out the institutional roles and responsibilities with no overlapping or conflicting mandates between institutions. Clarity of roles avoids institutional conflicts and gaps in implementation. There should also be clear requirements for decision-making with limited discretion. The legal framework needs to specify the basis or conditions upon which decisions will be based.

For instance, a development control framework should lay out the requirements that need to be met for the grant of a building permit, including the steps that need to be undertaken, the documents needed and the timeframes for each decision stage. Discretion of public officials should also be limited, as unlimited discretion could create room for inefficiency or corruption.

The Malawi *Physical Planning Act 2016* makes it clear that the preparation of local physical development plans for the area within its jurisdiction is the responsibility of a local government authority (Section 35.1). In Tanzania, the *Urban Planning Act 2007* empowers every city council, municipal council, town council and township authority to be the planning authority in its area of jurisdiction (Section 7.1) and that the planning authority is the entity responsible for controlling and regulating development in the relevant planning area (Section 40). Similarly, the Iceland *Planning and Building Act 1999* gives municipalities the mandate for urban planning by requiring them to prepare municipal plans which cover all the land within the municipality's boundaries and set out the policy regarding land use, transport and service systems, environmental matters and the urban development (Article 16).

In the Philippines, the role of local governments is strengthened through the ***Climate Change Act 2009*** which provides that local governments are the frontline agencies in the formulation, planning and implementation of climate change action plans in their respective areas.

The Act further requires municipal and city governments to consider climate change adaptation as one of their regular functions (Section 14).

1.4.2. LOCAL GOVERNMENT CAPACITY BUILDING

Urban areas not only substantially contribute to climate change – they account for around two-thirds of global emissions – but they are also particularly vulnerable to the impacts of climate change, including sea level rise, groundwater depletion, fires, food shortages, extreme temperatures and increased frequency of extreme weather events such as floods, droughts and storms which affect city infrastructure and the livelihoods and health of residents.²⁷ These two factors, coupled with the fact that urban populations are expected to steadily grow to 68 per cent of the world's population by 2050,²⁸ mean that local authorities ought to keep pace with the increased demand for sustainable, safe and inclusive urban areas.

Authorities can only fulfil their mandates and satisfy these needs if they have been sufficiently equipped. As the Paris Committee on Capacity Building has noted, "capacity-building is a critical means of implementation and achieving the goals of the Paris Agreement requires enhanced, sustained and long-term capacity if countries are to close the gap between ambition and implementation".²⁹ Accordingly, there should be an emphasis on building and improving local governments' capacities.

Mechanisms include defining adequate minimum qualifications of staff, performing capacity needs assessments and mandatory periodic trainings, promoting knowledge exchange with other local governments, and introducing performance-based incentives, among others. Finland's ***Land Use and Building Act 1999*** explicitly provides that local authorities must have sufficient resources and expertise available for their functions and, if the local authority's population is greater than 6,000, the local authority must have a planner who is qualified to manage its planning functions.

Furthermore, every local authority must have a building inspector for the purpose of building guidance and control. The Philippines' ***Climate Change Act 2009*** vests the responsibility to prepare Local Climate Change Action Plans in local government units (LGUs) and obligates the national government to provide technical and financial assistance to them for this purpose.

27 REN (2019). Renewables in Cities 2019 Global Status Report.

28 UNDESA (2018). 2018 Revision of World Urbanization Prospects.

29 UNFCCC (2019). Paris Committee of Capacity-Building, Coherence and coordination of capacity-building activities of constituted bodies and in other relevant processes under the Convention.

1.4.3. INTER-MUNICIPAL COLLABORATIONS BEYOND ADMINISTRATIVE BOUNDARIES FOR URBAN AND INFRASTRUCTURE PLANNING

Rapid urbanization has contributed to the expansion of urban areas beyond their traditional administrative boundaries in many parts around the world. The effect of this phenomenon has been the emergence of human settlements that do not fit wholly within any one municipal area but are spread across two or more. In this sense, the administrative boundaries do not correspond to functional and morphological boundaries, leading to institutional loopholes and service delivery gaps. For climate-responsive urban planning in such areas, it is thus essential that the legal framework devises suitable institutional arrangements for effective urban governance. These may take the form of informal and flexible inter-municipal collaborations for urban and infrastructure planning. A good example is Montenegro's *Law on Local Self Government 2003*, which allows local governments, based on the principles of voluntarism and solidarity,

to freely cooperate and combine resources in executing tasks that commonly affect them, including urban and infrastructure planning. Inter-municipal collaborations may take the form of an 'association' or an 'inter-municipal community', with the latter being more institutionalized (Article 127-133). Similarly, in the Former Yugoslav Republic of Macedonia, the *Law on Local Self-Government 2002* allows municipalities to create shared public agencies and administrative bodies to facilitate cooperation on inter-municipal mandates such as urban and rural planning and construction of infrastructure (Article 14). In Colombia, Article 14 of *Law 1454 of 2011* states that "two or more municipalities of the same department, or of several departments, may associate administratively and politically to jointly organize the provision of public services".

TABLE 1. Governance Framework for Urban and Climate Planning

Multi-level institutional coordination	1.1 Does your country have provisions in legislation or regulations requiring multi-level institutional coordination for climate action and urban planning?	
	i. Do these include legal provisions that require inter-institutional coordination among national and subnational governments?	Yes/No
	ii. Do these include legal provisions that require coordination across line ministries at the national level?	Yes/No
	iii. Do these include legal provisions that require coordination among local jurisdictions that belong to the same metropolitan area?	Yes/No
	iv. Do these include legal provisions that require coordination between neighbouring cities and rural areas that are part of the same economic, social or environmental functional areas?	Yes/No
	v. Do these include legal provisions that require coordination among different line departments in local governments?	Yes/No
Participatory governance	1.2 Does your country have provisions in legislation or regulations requiring engagement with local stakeholders, civil society and businesses in urban planning processes and climate planning processes?	
	i. Do these include legal provisions that require stakeholder and community identification?	Yes/No
	ii. Do these include legal provisions that grant the right of access to information across the planning process?	Yes/No
	iii. Do these include legal provisions that require participation across the planning process and not only when the urban plans have already been developed?	Yes/No
	iv. Do these include legal provisions that require planning institutions to tailor participatory processes to specific community needs?	Yes/No
	v. Do these include legal provisions that require consideration of and response to community demands and priorities?	Yes/No
	vi. Do these include legal provisions that grant access to dispute or appeals mechanisms?	Yes/No
Data collection and sharing	1.3 Does your country have provisions in legislation or regulations requiring data collection and sharing arrangements of climate-sensitive information among different institutions dealing with urban planning and climate planning?	
	i. Do these include legal provisions that require data collection and sharing among local, subnational and national levels?	Yes/No
	ii. Do these include legal provisions that require data collection and sharing among subnational governments (different cities, regions, provinces)?	Yes/No
	iii. Do these include legal provisions that require data collection and sharing among different departments and institutions in the same city?	Yes/No

Local governments' mandate for urban planning in urban areas	1.4 Does your country have provisions in legislation or regulations assigning local governments the mandate for urban planning in their urban areas?	
	i. Do these include provisions with the clear definition of institutional roles and responsibilities?	Yes/No
	ii. Do these include provisions that require local governments to build and improve their capacities to implement their mandates?	Yes/No
	iii. Do these include provisions that require or facilitate informal and flexible inter-municipal collaborations for urban and infrastructure planning when administrative boundaries do not correspond to functional boundaries and morphological boundaries?	Yes/No



View of the city of Florence from Piazzale Michelangelo with Ponte Vecchio © Peter Kittsteiner, 2018

2. URBAN AND TERRITORIAL PLANNING

Urban planning traces its roots to addressing negative externalities of industrialization and urbanization with a particular focus on improved sanitation and control of diseases and epidemics. It has since evolved into a broader policy instrument that establishes long-term, sustainable frameworks for social, territorial and economic development. The role of urban planning in sustainable development was first recognized at the 1972 United Nations Conference on the Human Environment and applied to human settlements at the 1976 United Nations Conference on Human Settlements in Vancouver, Canada (Habitat I). The Vancouver Declaration specifically urges states “to adopt bold, meaningful, and effective human settlement policies and spatial planning strategies ... considering human settlements as an instrument and object of development”. The role of urban planning received further attention at the 1992 United Nations Conference on Environment and Development (UNCED) through Agenda 21 Action Plan, which called for integrated physical and land-use planning to “make the most efficient trade-offs and to link social and economic development with environmental protection and enhancement”.³⁰

This overarching importance was further elaborated by the Istanbul Declaration at the 1996 Second United Nations Conference on Human Settlements (Habitat II) and has since been affirmed by the NUA, which calls for readdressing the way cities and human settlements are planned as a way of ending poverty, reducing inequalities, promoting economic growth, fostering resilience and protecting the environment.³¹ The NUA notably goes further to require the integration of climate change adaptation and mitigation considerations and measures in urban and territorial development and planning processes in recognition that cities are both major contributors to climate change and the main targets of its effects and risks.³² The adoption of the International Guidelines on Urban and Territorial Planning in 2015 was also a major milestone in recognizing the role of planning instruments for sustainable and inclusive urban development.

Urban planning frameworks vary among countries but most of them have a three-tiered hierarchy with national, sub-national (regional) and local levels. The national framework often identifies the broader objectives of planning and strategies for implementation. These are then adopted and tailored at the sub-national and local levels through sub-national (regional) plans and local (urban) plans respectively.

³⁰ “Integrated approach to the planning and management of land resources” (Chapter 10). Agenda 21 Action Plan.

³¹ Para 5.

³² Para 101.

2.1. NATIONAL TERRITORIAL PLANNING

National territorial plans support, structure and balance the system of towns and cities to fully unleash their economic potential through existing and planned economic policies and large infrastructure.³³ National territorial planning instruments take various forms and many countries have different names for them; for example National Spatial Plan (Kenya, Jamaica and Estonia); National Spatial Strategy (Ireland and Japan); National Spatial Development Framework (Ghana); National Framework for Physical Planning (Philippines); National Spatial Development Concept (Poland) and National Strategic Plan for Urban Development (Egypt). Despite their titles, the underlying objective of such documents is ensuring balanced social, economic and environmental growth. They often describe the country's development trends, challenges and opportunities; highlight the main land uses; identify the location of major infrastructure; and recognize inter-sectoral linkages involved in the use and allocation of land and other natural resources.

2.1.1. NATIONAL LAND-USE CLASSIFICATION

Considering that the function of planning is to promote and balance socio-economic development with environmental considerations, classifying land with allowed uses enables these objectives to be achieved in a coordinated manner. It allows the protection of ecosystems that perform mitigation and adaptation functions (e.g., forests, mangroves etc.), and restricts urban development in unsuitable areas. Land classifications vary by country but the zoning categories that could be considered include built-up areas; agricultural areas; protected areas (such as forests and wetlands); cultural heritage areas; and national parks.

In almost all cases, national territorial plans also recommend policy options, strategies and measures that may be undertaken to promote balanced urban and rural development in a coherent, sustainable, and inclusive manner. Notably, although at times these plans, strategies and frameworks go beyond spatial planning to include broader issues such as agriculture, industrialization, tourism and mining, the overall aim is often finding the most optimum use of space for achieving not only stronger economic prospects from these activities, but also a better quality of life and the highest environmental integrity.

This section of the assessment highlights the most relevant components of climate change mitigation and adaptation in national territorial planning, and the importance of coordinating the national territorial plan with national climate plans (adaptation and mitigation plans).

The South Korea's *National Planning and Utilization Act 2013* categorizes national land into urban areas; control areas; agricultural and forest areas; and natural environment and conservation areas (Article 6). In the Philippines, classification through the *National Framework for Physical Planning 2001-2030* includes agricultural areas, coastal and marine zones; production forests; mineral lands; and industrial and tourism development areas.

³³ UN-Habitat (2015). International Guidelines on Urban and Territorial Planning.

Kenya's land is classified by the **National Spatial Plan 2015-2045** as built up areas; agricultural areas; forests (indigenous and mangrove); national parks; marine parks; flood plains; water towers; wetlands; and rangelands. Poland's **National Spatial Development Concept 2030**

also identifies various land-use classifications, including urban areas; rural areas; and protection zones (consisting mainly of national parks, nature reserves, landscape parks, protected landscape areas and the European Natura 2000 network).

2.1.2. INTEGRATED TRANSPORT AND INFRASTRUCTURE NETWORK

The availability of an integrated transport and infrastructure network is key for harmonious and balanced economic growth. Extensive and efficient transport infrastructure is essential for well-functioning economies and the development of regions and cities. When designed effectively, transport networks can be an engine for productivity and improved quality of life for citizens, and allows regions and cities to leverage benefits from agglomeration and concentration.³⁴ Infrastructure guides and supports urban and rural development, facilitates economic activities and promotes integration of previously marginalized regions. At the same time, a disconnect between territorial planning and infrastructure provision may contribute to haphazard growth, imbalance in development between different regions, socio-economic inequities and unsustainable use of natural resources. It is thus essential to adopt a more strategic approach to territorial planning that integrates transport and infrastructure networks. Kenya's **Physical and Land-Use Planning Act 2019** identifies one of the functions of national territorial planning as "providing a framework for guiding the location and development of strategic national investments and infrastructural development" (Section 22.2.i). Accordingly, the Kenyan **National Spatial Plan 2015-2045** calls for an integrated urban transport system to enhance provision of relevant modal split and to integrate land-use and transport planning to encourage development patterns which reduce transport demands.

It proposes an integrated national and urban transport system that seeks to maximize efficiency and sustainability of the transport sector and envisions a balanced transport infrastructural development through provision of the missing links and improvement of the quality of transport services. Furthermore, the plan calls for the establishment of a hierarchy of transport systems comprising rail, road, water (lake and sea) and air services to link all major economic production areas.

Poland's **National Spatial Development Concept 2030** aims to improve territorial accessibility at different spatial levels through alignment of transport investment priorities in medium- and long-term strategic documents and European Union guidelines on the Trans-European Transport Network. It prioritizes transport projects to improve the internal and external accessibility of Poland, including land and water investments intended to improve access to Poland from other European countries and connections between cities located farther away from major socio-economic centres. Furthermore, the National Spatial Development Concept 2030 specifies integration of telecommunications, primarily by supporting the development of ICT networks in rural areas and preventing the digital exclusion of social groups and regions as one of its main priorities.

³⁴ OECD. "Transport infrastructure trends and regional developments." Available at <https://www.oecd-ilibrary.org/sites/512e786f-en/index.html?itemId=/content/component/512e786f-en>

2.1.3. COORDINATION BETWEEN NATIONAL TERRITORIAL PLAN AND NATIONAL CLIMATE PLANS

In addition to national territorial plans, countries have also adopted several climate plans which seek to guide domestic climate action. These climate plans include National Action Plans (often used by countries as a mechanism for integrated climate action), National Adaptation Plans (agreed under the Cancun Adaptation Framework) and within the European Union, National Energy and Climate Plans (which determine national contributions of each Member State towards the binding EU energy-climate targets and the objectives of the Energy Union). However, parallel application of national territorial plans on the one side, and the pursuit of targeted strategies within national climate plans on the other leads to fragmented actions that cannot respond to the magnitude and urgency of climate change.³⁵ Effective climate action requires the development and implementation of territorial plans able to advance climate goals and objectives, which should be done by coordinating the national territorial plans with national climate plans.

The Philippines offers a good example through the Climate Change Act 2009 which creates the Climate Change Commission as the lead policy-making body of the government and requires it to coordinate, monitor and evaluate programmes and action plans of the government to ensure the mainstreaming of climate change into the national, sectoral and local development plans and programmes (Section 4).

The Kenya Climate Change Act 2016 provides that the National Climate Change Action Plan should address all sectors of the economy and provide mechanisms for mainstreaming climate change into those sectors (Section 13.4). It also obligates each state department and national government public entities to integrate the National Climate Change Action Plan into sectoral strategies, action plans and other implementation projections (Section 15.5.a). Accordingly, the National Spatial Plan, which is prepared by the department of physical planning (under the Ministry of Lands and Physical Planning), is required to include climate change considerations. In Colombia, Article 17 of Law 1931 of 2018, known as Ley de Cambio Climático (Climate Change Law), requires the Ministry of the Environment and Sustainable Development and the National Planning Department to take into account the National Climate Change Policy and the guidelines established in the other programmes and instruments for climate change planning and management when developing guidelines for the formulation, implementation, monitoring and evaluation of the Integral Sectoral Climate Change Management Plans (PIGCCS). Article 7 also states that “the national government will regulate Article 10 of Law 388 of 1997 within the framework of its competencies, with the purpose of including the management of climate change among the determinants of territorial planning”.

³⁵ Jan Corfee-Morlot, Lamia Kamal-Chaoui, Michael G. Donovan, Ian Cochran, Alexis Robert and Pierre-Jonathan Teasdale (2009). “Cities, Climate Change and Multilevel Governance”, OECD Environmental Working Papers No. 14. OECD.

2.1.4. CLIMATE VULNERABILITY OF THE NATIONAL TERRITORIAL PLAN

This element seeks to assess the impact of climate change on the implementation of the national territorial plan i.e. assess the resilience of the plan to the effects and risks of climate change. It seeks to determine whether climate vulnerability is assessed in various elements of national territorial plans. For instance, how would infrastructure envisaged in the plan be affected by and respond to climate change? If there is urban development in coastal zones, are the effects of sea level rise and inundation factored in? Similarly, if the plan has identified agricultural areas for food production, has the vulnerability of such areas to severe weather such as droughts and flooding been considered?

For example, Finland's *National Land-Use Guidelines 2000* recognize the need to adapt to increased climate change risks such as precipitation levels, floods, average temperature, soil and groundwater conditions and the increased occurrence of extreme weather events such as storms, torrential rains and urban floods. It calls for siting new construction outside flood risk areas or otherwise ensuring flood risk management; siting establishments causing major-accident hazards, chemicals rail yards and marshalling yards of hazardous substance sufficiently far from residential areas, areas of public use and areas of natural sensitivity.

2.1.5. EMISSIONS ASSOCIATED WITH NATIONAL TERRITORIAL PLAN

The purpose of this sub-section is to examine the potential impact of the national territorial plan on climate change mitigation, i.e., examine whether its implementation may lead to increased GHG concentrations (higher emissions or reduced carbon sinks). Such an examination may be carried out through environmental impact assessments (EIAs) or strategic impact assessments (SEAs) of the national territorial plan. Ghana's *Land Use and Spatial Planning Act 2016* requires the National Spatial Development Framework to contain a strategic environmental assessment. The *National Spatial Development Framework 2015-2035* thus includes an annex (2) with a report on whether the initiatives and activities made possible in the framework can cause significant impact on the environment.

For instance, the SEA notes that new transport infrastructure may pass through valuable nature areas or landscape types functioning as green links as well as a possible reduction of nature areas when building roads and railways. It also observes that the suggested infrastructural initiatives can have both positive and negative effects on climate and resources depending on the extent and use. "If the projects create a more fluid traffic, hence reducing congestions, the use of fuel may also be reduced. On the other hand, better infrastructure may also result in greater use and thereby greater use of fuel and a greater climate impact."³⁶

36 Annex 2: Strategic Environmental Assessment of the Ghana NSDF (2015-2035) available at <https://new-ndpc-static1.s3.amazonaws.com/CACHES/PUBLICATIONS/2016/04/16/NSDF+Annexes+Final+Edition+TAC.pdf>

2.2. REGIONAL (SUB-NATIONAL) TERRITORIAL PLANNING

The second level of planning in most countries is the regional/sub-national level. The objectives of regional territorial planning are often like the national ones but with contextual modifications based on specific challenges and opportunities. However, in some countries (such as Norway, Canada, Australia and Finland), territorial planning is done at the regional rather than the national level due to varying geographical features, natural resource endowments and

socio-economic conditions between different regions. These factors make regional territorial planning a valuable instrument for translating national plans and priorities into regional contexts - for those that have national territorial plans - and a must-have tool for jurisdictions where regional planning is the highest level of spatial organization. Accordingly, most elements under the national territorial planning section are also included in this part of the assessment.

2.2.1. INTEGRATED TRANSPORT AND INFRASTRUCTURE NETWORK

The rationale for linking national spatial planning to an integrated transport and infrastructure network also applies to regional planning. The *Central Highlands Regional Growth Plan* (Australia) provides a good example of how to ensure access and connectivity between settlements within and external to the region, i.e., by providing social infrastructure that is well located and accessible in relation to residential development, public transport services, employment and educational opportunities, and direct development to locations that make the best use of existing water, energy and utility infrastructure and minimize the need for infrastructure upgrades or expansion. In the Melbourne Metropolitan Region, *Plan Melbourne 2017-2050* also contains comprehensive strategies to provide an integrated transport

system that connects people to jobs and services and goods to the market.

In Canada, the Greater Vancouver Regional District Board adopted the *Metro Vancouver 2040: Shaping Our Future* policy, which notes that land use influences travel patterns, and transport systems in turn have an impact on land use and development. It recognizes that achieving the goals of the Regional Growth Strategy requires the alignment of land use and transport strategies. It thus calls for accessible and sustainable transport choices supported by strategies for a compact urban area, and transit-oriented development patterns throughout the region with growth focused on urban centres and frequent transit development areas.

2.2.2. COORDINATION BETWEEN REGIONAL TERRITORIAL PLAN AND NATIONAL CLIMATE PLANS

As earlier highlighted, it is crucial to have adequate linkages between territorial plans and national climate plans for coherence and coordinated action that is needed to address the multi-faceted challenge that is climate change. This applies at the regional level as well.

Kenya's *Climate Change Act 2016* is unequivocal that county governments must mainstream the implementation of the National Climate Change Action Plan in the development, updating and approval of the county Integrated Development Plan (Section 19.2).

Consequently, several counties have included climate considerations in their plans. For instance, the *Nairobi Integrated Development Plan 2018-2022* notes that climate change has affected the county through rising temperatures, changes in precipitation levels, unpredictable weather patterns and increased food insecurity. It therefore calls for the adoption of several response strategies, including the establishment of early warning systems; monitoring climate

change and disseminating information to farmers; adaptation of new technologies in both solid and other types of waste management as opposed to using open dumping sites; and diversification of energy sources by investing in renewable sources, water harvesting, recycling and conservation. In Colombia, *Decree 1807 of 2014* states in Article 1 that regional territorial plans must be coordinated with national climate plans.

2.2.3. CONSISTENCY OF REGIONAL TERRITORIAL PLAN WITH NATIONAL TERRITORIAL PLAN

Consistency of plans from the national to the regional level is essential for coherent and coordinated territorial development. Several mechanisms may be used to achieve this consistency, such as requiring that regional plans need to be consistent and compatible with the directions of the national plans; a legal requirement that regional plans need to receive a non-binding opinion on the content of the regional plans by the national authority that develops the national plans; or a legal requirement that regional plans need to be approved by the national authority that develops the national plans. Ghana's *Land Use and Spatial Planning Act 2016* provides that the Regional Spatial Development Framework or Multi-Regional Spatial Development Framework

must conform to the general requirements of the National Spatial Development Framework (Section 52.12). Kenya's *Physical and Land Use Planning Act 2019* requires each county's physical and land-use development plan to conform with the National Physical Plan and any relevant Inter-County Physical and Land Use Development Plan (Section 36.2). Similarly, Trinidad and Tobago's *Planning and Facilitation of Development Act 2014* mandates all development plans to be consistent with the National Spatial Development Strategy (Section 20.2). In Samoa, consistency is achieved by a declaration in the *Planning and Urban Management Act 2004* that a national sustainable management plan prevails over all other plans (Section 27.4).

2.2.4. CLIMATE VULNERABILITY OF THE REGIONAL TERRITORIAL PLAN

This element seeks to assess the impact of climate change on implementation of the regional territorial plan, i.e. assess the resilience of the plan to the effects and risks of climate change. A climate-responsive plan should aim to reduce rather than increase climate change vulnerability. The regional plan should thus have a mechanism to determine how vulnerable it is and propose relevant adaptation measures in response.

An insightful provision is Section 19.d of Norway *Regulations on Impact Assessments 2017*, which provides that the description of the regional plan or initiative must include how vulnerable the plan or initiative is to climate changes and natural hazards such as floods, landslides, storm surges and rising sea level.

2.2.5. EMISSIONS ASSOCIATED WITH REGIONAL TERRITORIAL PLAN

This sub-section examines the potential impact of the national territorial plan on climate change mitigation, i.e., whether its implementation may lead to increased GHG concentrations (higher emissions or reduced carbon sinks). Norway's *Regulations on Impact Assessments 2017* provides that the description of the regional plan or initiative must include the main features of the initiative's operational phase, the initiative's energy requirements, energy consumption, energy solutions, transport requirements and the nature and quantity of natural resources that will be used, and an estimate of the type and volume of waste, residues, emissions and pollution that will be produced in the construction and operation phase (Section 19).

It further adds that the impact assessment needs to identify and describe the factors that may be affected and to assess significant impact on the environment and society, including pollution (emissions to air, including greenhouse gas emissions), and impact because of climate changes, including the risk of rising sea level, storm surges, floods and landslides (Section 21). Finland *Land Use and Building Act 1999* also states that plans must be founded on sufficient studies and reports, and that when a plan is drawn up, the environmental impact of implementing the plan, including socio-economic, social, cultural and other impacts, must be assessed to the necessary extent (Section 9).

2.3. URBAN PLANNING IN URBAN AREAS

Urban plans guide and regulate development at the municipal, neighbourhood or local levels. They seek to provide an enabling framework for new economic opportunities, regulation of land and housing markets and the timely provision of adequate infrastructure and basic services.³⁷ Often, their main focus is setting planning (and sometimes building) standards, creating zones and identifying various land uses. In most countries, urban plans are anchored in urban planning and land-use regulations, which lay out the urban plan-making process and specify the matters to be included in the plans. The most common regulations include zoning, allowed uses, density requirements, setbacks, parking regulations, urban containment instruments, open space reservations and protection zones.

These elements make urban plans useful mechanisms for promoting climate change mitigation and adaptation. By determining the location of urban development, the quantity and quality of buildings and basic infrastructure, and specifying what may be done differently, urban plans have the potential to steer cities towards lower emissions and greater resilience to climate change. This section of the assessment focuses on several aspects of urban plans that are particularly crucial for climate change mitigation and adaptation, including land-use classification; planning at scale; urban growth boundaries; long-term planning; capability for review considering new scientific information and fresh options; and coherence of planning from the national to the local level through consistency of plans.

2.3.1. LAND-USE CLASSIFICATION

Land-use classification should be an important element, not only of national planning instruments but also urban plans. Land classification allows multiple objectives to be attained in a coherent and sustainable manner. For instance, it makes it possible to increase the housing stock without destroying green zones and facilitates renewal without the loss of cultural heritage. At this level, land may be classified in categories such as land for urban development that includes already built-up areas with adequate infrastructure; urban regeneration areas (built-up areas that need to be improved); and unbuilt land that can be used for urban expansion. Other zones are lands that should not be used for urban development, including agricultural lands whose importance for food and water security means they should be free from urban development;

cultural heritage zones; and buffer zones to protect sensitive ecosystems and natural environments that should not be used for urban development (forests, wetlands, etc.). Urban planning and land-use laws in many countries list the uses that urban plans should specify.

Tanzania's *Urban Planning Act 2007* empowers planning authorities to reserve land for various uses, such as industrial and commercial purposes, formal and informal housing, urban agriculture, urban forests and green belts, and open spaces and parks (Section 28.f). Similarly, Switzerland's *Spatial Planning Act 1979* requires cantons to establish in their structure plans which areas are suitable for agriculture; are of special beauty or are important for recreation or as natural habitats; are suitable for producing electricity from renewable energies;

37 UN-Habitat (2015). International Guidelines on Urban and Territorial Planning.

or are seriously endangered by natural hazards or harmful emissions (Article 6). The Colombian law on the modernization of municipalities' organization and functions (Law 1551 of 2012) requires municipalities to formulate and adopt the Planes de Ordenamiento Territorial

(POT), which should specifically regulate "land uses in urban, expansion and rural areas, in accordance with the laws and taking into account the instruments defined by the Unidad de Planificación Rural Agropecuaria (UPRA) for land-use planning and use" (Article 6).

2.3.2. PLANNING FOR FUTURE LAND NEEDS IN SAFE LOCATIONS

'Planning' is by definition about the future and urban planning should be proactive rather than reactive. Lack of foresight has contributed to many urban challenges, including inadequate supply of serviced land, infrastructure and basic services (water, sanitation and drainage), the growth of informality, urban development in risky areas, and destruction of natural ecosystems and biodiversity. Urban plans ought to anticipate the required need for urban space, infrastructure and services well in advance and provide for ways of dealing with them. Accordingly, they ought to consider factors such as demographic and migratory trends, housing needs and income projections, among others, when developing new plans.

Zambia's *Urban and Regional Planning Act 2015* requires an integrated development plan to include a planning survey which contains the principal spatial and economic characteristics of the area under the planning authority; the size, composition and distribution of the population

of the area; the communication and transport system and traffic patterns of the area and neighbouring areas; and an assessment of the existing infrastructure and level of development in the area, which shall include an identification of communities which do not have access to basic services and those proposed or designated for redevelopment, improvement, upgrading, revitalization or renewal (Section 20.3). Tanzania's *Urban Planning Act 2007* requires planning schemes to include population growth projections, distribution and movement; identification of actual or likely problems that may affect the natural resources and the broader environment; employment and incomes, including characteristics of employment, income distribution, labour force, potential of the informal sector and their locations; and human settlements, including distribution of existing services, growth and pattern of urbanization, environmental degradation and identification of trends in the development of urban and rural settlements (First Schedule).

2.3.3. URBAN GROWTH BOUNDARIES

Urban growth management aims to guide the location, quality and timing of development to minimize "sprawl", which is characterized by low-density, non-contiguous, automobile-dependent development that prematurely or excessively consumes farmland, natural preserves and other valued resources.

It is intended to encourage urban areas to grow inwards and upwards, not outwards.³⁸ Urban growth boundaries are one of the mechanisms for urban containment. They have the potential to contribute to climate change mitigation by creating more compact, less car oriented built form, in addition to their ability to preserve carbon

38 Jonathan Martin, Rolf Pendall and William Fulton (2002). Holding the Line: Urban Containment in the United States. Brookings Institution Centre on Urban and Metropolitan Policy.

sinks by preventing development in surrounding natural and agricultural areas. Urban growth boundaries could be categorized as having either explicit boundaries or implicit boundaries. An explicit boundary line is set by either a spatial plan or regulatory instrument while an implicit boundary line is established by the accumulated boundaries of land-use zones in spatial plans. The London Green Belt is a well-known implicit urban containment measure initiated through a range of legal instruments, including the **Green Belt (London and Home Counties) Act 1938**, the **Town and Country Planning Act 1947** and the **National Planning Policy Framework 2019**.

2.3.4. LONG-TERM PLANNING

Urban planning entails conceptualizing a desired future and taking concrete actions to achieve it. It is a self-conscious collective (societal) effort to imagine or re-imagine a town, city, urban region or wider territory and to translate the result into priorities. Planning also highlights a developmental movement from the past to the future. It implies that it is possible to decide between appropriate actions now in terms of their potential impact in shaping future socio-spatial relations.³⁹ Long-term planning focuses on how far ahead policy makers look in terms of years. This indicator is concerned with how that information is used for future planning, i.e. whether the identified issues are factored into planning, not just for the present but for medium- to long-term purposes. Notably, long-term planning finds support in the New Urban Agenda, which calls for “integrated planning that aims to balance short-term needs with long-term desired outcomes of a competitive economy, high quality of life and sustainable environment”.⁴⁰

Other examples are Oregon's **Senate Bill 100 on State-wide Planning 1973**, which was used to contain urban sprawl in Portland by establishing an explicit growth boundary, and Finland's **Planning and Building Act 1999**, which provides that the local detailed plan should be presented on a map indicating the boundaries of the area covered by the local detailed plan and the boundaries of the various areas included in the local detailed plan as a way of containing urban growth (Section 55).

Long-term planning is particularly relevant in this module considering how seriously cities are projected to be impacted by climate change. As such, urban planning needs to be future-oriented and this module estimates that a planning period of about 20 years is considered to be appropriate long-term planning. Several countries have already recognized this need and specified how anticipative their planning frameworks should be over the years. For example, South Africa's **Spatial Planning and Land Use Management Act 2013** mandates municipal spatial development frameworks to include a longer-term spatial development vision statement for the municipal area which indicates a desired spatial growth and development pattern for the next 10 to 20 years (Section 21.c). China's **Urban and Rural Planning Law 2008** also specifies the period covered by the overall plan of a city or town as 20 years (Article 17).

39 Healey, P. (2004). “The treatment of space and place in the new strategic spatial planning in Europe”. *International Journal of Urban and Regional Research* 28(1): pp. 45–67.

40 Para 94.

In Colombia, the *Climate Change Law* (Law 1931 of 2018) identifies the initial planning horizon of the Comprehensive Sectoral Climate Change Management Plans (PIGCCS) and the

Comprehensive Territorial Climate Change Management Plans (PIGCCT) through to 2021, but provides that after 2029, the planning horizon becomes 20 years (Article 20).

2.3.5. URBAN PLAN REVIEWS

One of the defining characteristics of climate change is uncertainties in terms of scope and effects. While there is scientific consensus on the reality of climate change and its broader effects on ecosystems and human lives, assessment of its risks and impacts on specific societies, economic sectors and geographies are still the subject of further scientific studies. There are multiple variables that make precise projections very difficult. These uncertainties are appreciated by the Intergovernmental Panel on Climate Change (IPCC), which has a “likelihood scale” that determines the probability of an event taking place ranging from virtually certain to exceptionally unlikely. In between, there are several probabilities, including very likely, likely, about as likely, unlikely and very unlikely. Furthermore, climate change risks are not only activated by hazards (such as sea level rise), but by vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk) which also need to be taken into account. For these types of uncertainties, the IPCC uses the terms limited, medium or robust to evaluate and communicate the degree of certainty over findings.⁴¹

The ever-growing body of scientific knowledge, both in terms of risks and vulnerabilities, must be appreciated in urban planning. As the New Urban Agenda states, there is need for built-in flexibility in plans to adjust to changing social and economic conditions over time.⁴² Urban plans should be amenable to review if new climate risks or new climate adaptation options are identified. For instance, Vietnam's *Urban Planning Law 2009* states that an urban plan may be adjusted when there is a change in climate, geological or hydrological conditions (Article 47.3). In Colombia, according to Article 20 of the *Climate Change Law* (Law 1931 of 2018), the Comprehensive Territorial Climate Change Management Plans (PIGCCT) are to be revised and adjusted in conformity with the available information on GHGs, vulnerability, adaptation and implementation means generated in the frame of the Climate Change Information System.

2.3.6. CONSISTENCY OF URBAN PLANS WITH NATIONAL TERRITORIAL PLAN

Consistency of plans across the planning hierarchies is crucial for coherence and coordination. The same mechanisms that promote consistency between national and

regional plans may also be applicable to consistency between the national and the local plans.

41 IPCC (2014). Climate Change 2014: Synthesis Report.

42 Para 94.

These include requiring that urban plans be consistent/compatible with the directions of the national plan; urban plans receive a non-binding opinion of the national authority that develops national plans; or urban plans be approved by the national authority that develops national plans. Zambia's ***Urban and Regional Planning Act 2015*** explicitly provides that an integrated development plan made by a local authority must be compatible with the National Planning Framework and the regional development plan (Section 19.4.d).

The United Kingdom's ***Planning etc. (Scotland) Act 2009*** states that in preparing a local development plan, the planning authority is to consider the National Planning Framework (Section 16.2.a). In Dominica, consistency is implemented at the development control stage where applications for development permission are assessed based on whether they conform to the National Physical Development Plan (***Physical Planning Act 2002***, Section 25. 1).

TABLE 2. Urban and Territorial Planning

National territorial planning	2.1 Does your country have provisions in legislation or regulations requiring the formulation of a national territorial plan?	
	i. Do these include legal provisions that require the national territorial plan to classify national land according to its use, for example in urban and non-urban land?	Yes/No
	ii. Do these include legal provisions that require the national territorial plan to establish an integrated national inland and coastal transportation and infrastructure network?	Yes/No
	iii. Do these include the legal requirement to coordinate the national territorial plan with national climate plans?	Yes/No
	iv. Do these include the legal requirement to assess the climate vulnerability of the implementation of the national territorial plan?	Yes/No
	v. Do these include the legal requirement to assess the greenhouse gas emissions associated with the implementation of the national territorial plan?	Yes/No
Regional territorial planning	2.2 Does your country have provisions in legislation or regulations requiring the formulation of regional territorial plans?	
	i. Do these include legal provisions that require regional territorial plans to establish an integrated transportation network and infrastructure system?	Yes/No
	ii. Do these include legal provisions that require the coordination of the regional territorial plans with national climate plans?	Yes/No
	iii. Do these include legal provisions to ensure that regional plans implement the objectives of the national territorial plan?	Yes/No
	iv. Do these include the legal requirement to assess the climate vulnerability associated with the implementation of the regional territorial plans?	Yes/No
	v. Do these include the legal requirement to assess the greenhouse gas emissions associated with implementation of the regional territorial plans?	Yes/No
Spatial plans for urban areas	2.3 Does your country have provisions in legislation or regulations that require the formulation of spatial plans for urban areas?	
	i. Do these include legal provisions that require urban plans to classify land based on what is and is not allowed within each category?	Yes/No
	ii. Do these include legal provisions that require urban plans to assess future land needs and identify land safe from the effects of climate change adequate to meet these needs?	Yes/No
	iii. Do these include legal provisions that require the setting of urban growth boundaries or other growth management strategies making sure that the amount of buildable land within the boundary is adequate to meet current and future land needs?	Yes/No
	iv. Do these include legal provisions that require a planning horizon of at least 20 years?	Yes/No
	v. Do these include legal provisions that require reviews of urban plans if new climate risks or new climate adaptation options are identified?	Yes/No
	vi. Do these include legal provisions to ensure that urban plans implement the objectives of the national territorial plan?	Yes/No

3. URBAN PLANNING AND DESIGN FOR ADAPTATION

Climate change has been described as “the defining issue of our time” and a “direct existential threat”, and for good reason.⁴³ Climate change poses unprecedented challenges in both complexity and magnitude. Extreme weather events have increased due to climate change, including an increase in the number of cold days and nights as well the frequency and duration of heat waves in Asia, Europe and Australia.⁴⁴ Changes in precipitation patterns have increased the risk of flooding in some regions while at the same time increasing the vulnerability of other regions to drought and famine. Climate change has resulted in rising sea levels, which are already threatening millions of coastal communities. These risks are expected to get worse. Climate change will hinder economic growth, challenge the fight against poverty and erode food security. It is also expected to catalyse the displacement of people and indirectly increase the risk of violent conflicts through the amplification of already existing drivers of these conflicts, such as poverty. Together, climate-related hazards and associated effects, including heat stress, inland and coastal flooding, air pollution, water scarcity, droughts, storms, heavy rains, landslides, sea level rise and storm surges, will not only threaten people, livelihoods and ecosystems but also undermine the realization

of the Sustainable Development Goals (SDGs)⁴⁵

Urban areas stand to be more acutely affected by climate change due to the concentration of people, economic activities, assets and social and cultural institutions, and impacts are already being felt by millions of urban dwellers throughout the world. Increased frequency of hot days and warm spells is resulting in a higher frequency of heat waves and is expected to exacerbate urban heat island effects, causing heat-related health problems.⁴⁶ Droughts are reducing water availability in many cities, which adds more people to the 150 million people currently living in cities with chronic water shortages.⁴⁷ For instance, Latin American cities such as Quito, Bogota and Lima are experiencing decreased water availability due to a reduction in the glacial mass.⁴⁸ Numerous urban areas are located along cyclone tracks and there is evidence that storms are increasing in both frequency and intensity. Heavy rainfall and storm surges would impact urban areas through flooding, which in turn can lead to the destruction of properties and public infrastructure, contamination of water sources, water logging, loss of business and livelihood options, and an increase in water-borne and water-related diseases.⁴⁹

43 United Nations Secretary-General's remarks on Climate Change on 10 September, 2018. Available at: <https://www.un.org/sg/en/content/sg/statement/2018-09-10/secretary-generals-remarks-climate-change-delivered>

44 Ibid, p 53.

45 IPCC (2014). AR5 Climate Change 2014: Synthesis Report.

46 Hajat, S., M. O'Connor and T. Kosatsky (2010). Health effects of hot weather: from awareness of risk factors to effective health protection. *The Lancet*, 375(9717), pp. 856-863.

47 Chapter 8: Urban Areas. In IPCC (2014). AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap8_FINAL.pdf

48 UNEP (2013). Where will the water go? Impacts of accelerated glacier melt in the Tropical Andes. GEAS September.

49 Chapter 8: Urban Areas. In IPCC (2014). AR5 Climate Change 2014: Impacts, Adaptation and Vulnerability. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap8_FINAL.pdf

In addition, sea level rise poses a huge threat to major as well as minor coastal cities. Although just 2 per cent of the world's total land is urban, almost 10 per cent of coastal land less than 10 metres above sea level is already urbanized or quasi-urbanized. Thirteen per cent of the world's total urban land mass is in low-elevation coastal zones. Indeed, some countries' urban populations are especially concentrated in low-elevation coastal zones. For example, in Guyana, Maldives, Belize and Suriname, 100 per cent of the urban population lives at an elevation lower than 10 metres above sea level, and 81 per cent of the urban populations of Thailand and Bahrain live at this low elevation. Because most countries' economies depend heavily on the activity of their cities, the increased vulnerability caused by the low elevation poses a risk to future national economic development and growth.⁵⁰

Considering that 55 per cent of the world's population lives in urban areas and this share is projected to increase to 68 per cent by 2050,⁵¹ there is a very strong and urgent need for urban areas to adapt to the effects of climate change. Indeed, the most vulnerable regions are where urbanization will take place more rapidly. Of the 2.5 billion people expected to live in cities in the next three decades, 90 per cent of them will be in Asia and Africa.⁵² It is thus imperative that serious consideration is given to adaptation in urban contexts.

UNFCCC calls for countries to "take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects",⁵³ and also exhorts the formulation and implementation of measures to "facilitate adequate adaptation to climate change".⁵⁴ It further implores countries to cooperate in preparing for adaptation and specifically mentions the need to develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification, as well as floods.⁵⁵ Adaptation also appears in the Kyoto Protocol which, in addition to reiterating the necessity of adaptation, identifies several sectors, including energy, transport, industry, agriculture, forestry and waste management. Notably, it notes that "adaptation technologies and methods for improving spatial planning would improve adaptation to climate change".⁵⁶ Adaptation had greater focus in the Cancun Agreements, and the momentum generated through the Cancun Adaptation Framework was crystallized in the Paris Agreement. Indeed, adaptation in the Paris Agreement occupies just as prominent a position as mitigation and most of the obligations under Article 7 apply to all parties with a very limited form of differentiation.⁵⁷ It recognizes that "adaptation is a global challenge faced by all" and is key to "the long-term global response to climate change to protect people, livelihoods and ecosystems".⁵⁸

50 Coalition for Urban Transitions (2019). *Climate Emergency-Urban Opportunity*.

51 UNDESA (2018). *2018 Revision of World Urbanization Prospects*.

52 *Ibid.*

53 Article 3.3

54 Article 4.1 (b)

55 Article 4.1 (e)

56 Article 10 (b) (i)

57 Differentiation in the context of adaptation is only manifested in provisions that call for assistance.

58 Article 7.2.

The preamble of the Paris Agreement recognizes how inequality affects vulnerability to climate change, as it will affect some nations more than others, leading to climate injustice. Other global commitments that have emphasised adaptation include the SDGs, with Goal 13 specifically mentioning building climate resilience and developing adaptive capacity to climate-related hazards and natural disasters. The Sendai Framework on Disaster Reduction recognizes that climate change is one of disaster risk drivers and, to this end, requires governments to prepare, review and periodically update disaster preparedness and contingency policies, plans and consider climate change scenarios and their impact on disaster risk.⁵⁹

The NUA includes various paragraphs that signify the importance of adaptation in the urban context. These include the commitment to promote “international, national, subnational and local climate action, including climate change adaptation and mitigation, and to supporting the efforts of cities and human settlements, their inhabitants and all local stakeholders to be important implementers”.⁶⁰

It also highlights the need for “medium- to long-term adaptation planning process, as well as city-level assessments of climate vulnerability and impact, to inform adaptation plans, policies, programmes and actions that build the resilience of urban inhabitants, including through the use of ecosystem-based adaptation”.⁶¹

It is on this robust international framework on adaptation that this section is grounded. It is divided into seven sub-sections that contain the most important elements for use of the law for successful adaptation in urban contexts. These are: climate risks and vulnerability for planned areas and infrastructure; identification and prioritization of adaptation options; implementation of the identified adaptation options; adaptation of slums and other vulnerable settlements; planned relocations from areas at risk of climate change; security of tenure; and development approval and adaptation.

59 Para 33.

60 Para 79

61 Para 80

3.1. CLIMATE RISKS AND VULNERABILITY FOR PLANNED AREAS AND INFRASTRUCTURE

The Cancun Adaptation Framework calls for enhancement of climate change-related disaster risk reduction strategies, taking into consideration early warning systems and risk assessment and management.⁶² The Paris Agreement also requires countries to engage in adaptation planning processes and the implementation of actions through, among other things, "assessment of climate change impacts and vulnerability, with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems",⁶³ and "recognize[s] the importance

of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage".⁶⁴ In the urban context, the NUA expresses the commitment to support "medium- to long-term adaptation planning process, as well as city-level assessments of climate vulnerability and impact".⁶⁵ Accordingly, this section covers the role of legal frameworks in ensuring that climate risks and vulnerability for planned areas and infrastructure are considered.

3.1.1. CLIMATE RISK AND VULNERABILITY ASSESSMENTS TO ASSESS CURRENT AND ESTIMATED FUTURE VULNERABILITIES AND RISKS AS PART OF THE URBAN PLANNING PROCESS

The first step to planning for adaptation in urban areas is understanding the relevant climate risks and the associated vulnerability of people, ecosystems and sectors. The risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems.⁶⁶ Vulnerability is defined as the propensity or predisposition to be adversely affected and encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

Exposure refers to the presence of people, livelihoods, species or ecosystems, environmental functions, services, resources, infrastructure or economic, social or cultural assets in places and settings that could be adversely affected.⁶⁷ This emphasises assessing current and future risks and vulnerabilities as part of the urban planning process. Examples include the *Norway Planning and Building Act 2008*, which requires planning authorities to make sure that a risk and vulnerability assessment is carried out for the planning area when preparing development plans (Section 4.3).

62 Decision 1/CP.16, The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, UN Doc. FCCC/CP/2010/7/Add. 1., 15 March 2011.

63 Article 7.9 (c).

64 Article 8.1.

65 Para 80.

66 Oppenheimer, M., M. Campos, R. Warren, J. Birkmann, G. Luber, B. O'Neill and K. Takahashi (2014). Emergent risks and key vulnerabilities. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.*

67 Ibid.

South Korea *National Planning and Utilization Act 2002* also mandates mayors/governors or the head of Si/Gun to ensure that an assessment of land, such as the soil, siting and potential for use of land, and an analysis of vulnerability to disasters has been conducted (Article 20.2). In Seychelles, the *Disaster Management Act 2014* creates the Vulnerability Assessment Committee and tasks it with conducting vulnerability and risk assessments and investigations to determine vulnerable areas for each hazard.

The Act particularly notes that information collected from the assessments should inform early warning on potential risks and hazards and guide national planning processes and development strategies (Section 14). In Colombia, the *Territorial Development Law* (Law 388 of 1997) specifically outlines the general components of municipal zoning plans and land-use planning schemes. These plans must identify “areas of high risk for the location of human settlements, due to natural hazards or risks, or unhealthy conditions” (Articles 12, 16, and 17).

3.1.2. METHODS AND PROCESSES FOR RISK AND VULNERABILITY ASSESSMENTS

This part is concerned with the methods and the processes of conducting risk and vulnerability assessments, i.e., which steps should be taken and which factors should be included. The Norway *Planning and Building Act 2008* requires the assessment to show all the risk and vulnerability factors of significance for determining whether the land is suitable for development purposes, and any changes in such factors because of the planned development. It also provides that areas where it is determined that a danger, risk or vulnerability exists must

be indicated in the plan as an area requiring special consideration (Section 4.3). The United States' *Water Infrastructure Act 2018* provides for risk assessments in the context of water provision to determine the risks to and resilience of water systems in case of natural hazards, among other causes. The Act also specifies the components that the risk assessments must address and establishes deadlines by which water systems must be certified to the United States Environmental Protection Agency upon completion of a risk assessment.

3.1.3. INCLUSIVE AND PARTICIPATORY VULNERABILITY ASSESSMENTS

A vulnerability assessment is participatory when it involves all stakeholders in decision making, for example by being allowed and facilitated to submit comments, ask questions, attend and participate in public meetings. A vulnerability assessment is inclusive when its outcomes include all stakeholders and gives special consideration to marginalized groups such as women, youth, older people, people with disabilities and slum dwellers as well as indigenous communities in particular, as they have traditional environmental knowledge and

historical memory of where disasters take place and how to cope with them.

Inclusivity and participation are not simply good administrative practices; they have several tangible benefits and result in more robust and legitimate outcomes by allowing multiple viewpoints and experiences, including the integration of alternative forms of knowledge into the processes and by getting support and buy-in needed for successful implementation.

The Philippines *Disaster Reduction and Management Act 2010*, for example, requires that the Office of Civil Defence (OCD) is to

identify, assess and prioritize hazards and risks in consultation with key stakeholders, including the local community (Section 9.c).

3.1.4. CLIMATE HAZARDS

This part is about the potential climate hazards that need to be identified in the risk and vulnerability assessments. A climate hazard refers to the “potential occurrence of a natural or human-induced physical event, trend or physical impact that may cause loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources”.⁶⁸ In most contexts, it often involves “climate-related physical events or trends or their physical impacts⁶⁹ and may include sea level rise, marine and fluvial flooding, erosion, precipitation, heat extremes, wildfires or landslides. A hazard may be a climate event (e.g., a heavy rain event), but it can also be a direct physical impact (e.g., a flood).

A hazard is not necessarily an extreme weather event (e.g., tropical storm, flooding), but can also be a slow onset trend such as less water from snow melt, increase in average temperature and sea level rise. The New York *Community Risk and Resiliency Act 2014* identifies the risks that need to be considered by the Department of State and the Department of Environmental Conservation. These include sea level rise, storm surges and flooding (Section 14). South Korea’s *National Planning and Utilization Act 2002* also identifies several hazards as presenting risks, including storms, floods, landslides and ground collapses (Article 37).

3.1.5. CLIMATE HAZARD MAPS

Hazard maps are essential for understanding the locations at risk, their frequency and their spatial extent. Hazard maps depict the spatial extent of hazards at different susceptibility levels and can also provide other technical information, such as the magnitude/intensity and, in some cases, information on the frequency or probability of the hazard occurrence. The Seychelles’ *Disaster Management Act 2014*, in addition to providing for risk and vulnerability assessments, also calls for identifying, analysing and mapping of hazards (Section 4.1.j). In Antigua and Barbuda, the Director of Disaster Preparedness and Response is obligated by the Disaster Management Act 2002 to gather timely and authoritative information concerning

the conditions and trends in the quality of the environment, both current and prospective, as these relate to the likelihood of disasters, and prepare and review hazard risk assessment maps of the country (Section S4.2.d & g). Another example is the Philippines’ *Disaster Reduction and Management Act 2010*, which calls for multi-stakeholder participation in the development, updating and sharing of a Disaster Risk Reduction and Management Information System and Geographic Information System-based national risk map as policy, planning and decision-making tools (Section 6.d). It also requires provincial, city and municipal Risk Reduction and Management Offices to consolidate local disaster risk information,

68 Ibid.

69 Ibid.

which includes natural hazards, vulnerabilities and climate change risks, and to maintain a local risk map (Section 12.c). Based on this law, the country has developed hazard maps according

to the magnitude, frequency and spatial extent of risks that differentiate between high susceptible areas, moderate susceptible areas and low susceptible areas.

3.1.6. IDENTIFICATION OF PEOPLE, PROPERTY AND ECONOMIC SECTORS EXPOSED TO CLIMATE RISKS

Risk and vulnerability assessments are not ends in themselves. Instead, they are meant to inform and guide comprehensive adaptation planning and implementation. The nature of climate change and the interaction between hazards, exposure and vulnerability mean that different groups may be affected to different extents by climate risks depending on various factors such as age, gender, economic status, health status etc. For instance, infants and elderly people are more sensitive to hazards such as heat stress; people with diseases, injuries or disabilities may be more sensitive to climate impacts; informal settlers may be more vulnerable to climate-related displacement than people with secure tenure; and women may be more affected by reduced precipitation or inhibited agricultural productivity. Accordingly, the effectiveness of such assessments relies on the extent to which they include useful information, including the people, property and economic sectors that are exposed to climate risks.

The Vulnerability Assessment Committee created under the Seychelles' *Disaster Management Act 2014* is required to assess disaster risk indicators to identify factors that influence risk and vulnerability, such as livelihoods and well-being on a national, regional and local level; assess the outcomes of impacts of disasters on livelihoods and psychosocial impacts of disasters; and update livelihood zones and baselines for monitoring vulnerability (Section 14). Risk assessments and the associated risk mapping under the Philippines' *Disaster Reduction and Management Act 2010* include a review of the technical characteristics of hazards as well as an analysis of exposure and vulnerability, including the physical, social, health, economic and environmental dimensions (Section 3).

3.1.7. PUBLICLY ACCESSIBLE HAZARD MAPS

Hazard maps need to be accessible to the public to ensure transparency and full use of relevant information in decision making. In Seychelles, the Disaster Risk Management Division is tasked with promoting education and awareness in relation to disaster risk management by acting as a repository and conduit for hazard

and other disaster-related information, and with collaborating with other agencies to develop and maintain a database on disaster-related information, including climate change, and to ensure access to the database by all stakeholders (*Disaster Management Act 2014*, Section 4.1.n).

3.1.8. REGULAR REVIEW OF HAZARD MAPS

One of the defining characteristics of climate change is uncertainties in terms of scope and effects. As more scientific information becomes available and climate risks are identified, hazard maps need to be reviewed accordingly. For instance, the Norwegian Water Resources and Energy Directorate is empowered by the *Water Resources Act 2000* to conduct flood hazard mapping in flood-prone areas and to update existing maps based on specific criteria, such

as if climate projections indicate that there will be major changes in the areas exposed to a 1 in 200-year risk of flooding in their catchments. The Saint Lucia *Disaster Management Act 2006* requires the Director of the National Emergency Management Organization not only to prepare but also to review disaster risk assessment maps of the country (Section 5.3.f), although it does not specify a timeframe for this to happen.

3.1.9. CLIMATE VULNERABILITY ASSESSMENT OF PLANS AND INFRASTRUCTURE

If urban plans are to be effective in promoting climate change adaptation, they must be "climate proof". They need to reflect an appreciation of potential climate risks and anticipate, prevent, reduce or otherwise prepare for them. An assessment of how vulnerable plans and infrastructure are to climate change may be determined through environmental impact

assessments or strategic impact assessments. Norway offers a good example; its *Regulations on Impact Assessments 2017* provide that the description of the plan or initiative must include how vulnerable the plan or initiative is to climate changes and natural hazards such as floods, landslides, storm surges and rising sea level (Section 19.d).

3.2. IDENTIFICATION AND PRIORITIZATION OF ADAPTATION OPTIONS

Once the climate risk assessment is complete and the hazards, exposure and vulnerability have been determined, the next step is the identification of adaptation options. This is followed by prioritization and selection of adaptation options in a process that should involve a wide range of relevant stakeholders. This section encourages the use of both infrastructure-based and ecosystem-based adaptation measures in the option selection process.

3.2.1. IDENTIFICATION OF ADAPTATION OPTIONS

This step entails compiling a list of all possible adaptation options. Developing a catalogue of measures provides a systematic collection of potential adaptation options for the specific urban context, which can be used for the subsequent assessment and selection process. When compiling the catalogue of adaptation options for consideration, the overall approach and objectives of adaptation planning in the urban area need to be contemplated. Identification of adaptation options is guided by the type of actions that may be undertaken. These include “soft” adaptation measures (such as introducing flexi-time work during heat waves and commissioning new buildings with climate-resilient design as part of planned urban building programme); technical/“grey” adaptation measures (such as refurbishing buildings, enhancing physical flood defences and increasing the capacity of stormwater drainage systems); and ecological /nature-based/“green” (such as implementing or expanding green infrastructure for water runoff management).

Additionally, it pays particular attention to the use of measurable and verifiable benchmarks against which progress can be assessed, as well as the extent to which the selected options will contribute to overall adaptations strategies and targets at the local, national and international levels.

Urban areas can also choose to focus on increasing “adaptive capacity”, which involves developing the ability of people, authorities and sectors to respond effectively to climate change.⁷⁰

As climate change presents novel and unique challenges, new and innovative adaptation strategies are required for the widest possible array of potential options. Particular attention should be paid to choosing measures which respond to the identified vulnerabilities, ensuring a good mix of different types of options and putting long-term goals above short-term political interests.⁷¹ These options can be obtained through expert judgment or spatial analogues.⁷² The former involves inputs from sector representatives, including community members, while the latter occurs where regions expected to face new climate risks derive lessons from regions that have already experienced similar conditions.

⁷⁰ <https://climate-adapt.eea.europa.eu/knowledge/tools/urban-ast/step-3-1>

⁷¹ climate-adapt.eea.europa.eu/knowledge/tools/urban-ast/step-3-1

⁷² Ibid.

The ***New South Wales Coastal Management Act 2016*** aims to “mitigate current and future risks from coastal hazards, considering the effects of climate change” and “to encourage and promote plans and strategies to improve the resilience of coastal assets to the impacts of an uncertain climate future, including impacts of extreme storm events” (Section 3). Accordingly, it calls for the preparation of coastal management programmes to set the long-term strategy for the co-ordinated management of land within the coastal zone. Notably, the Act requires such programmes to identify the coastal management issues affecting the areas to which the programme is to apply, as well as identifying the actions required to address those issues in an integrated and strategic manner (Section 15.1 (a) and (b)).

In Colombia, Law 99 of 1993 (***General Environmental Law***) recommends a variety of options typically implemented by the Ministry of Environment and Sustainable Development or Regional Autonomous Corporations that will allow Colombia to better adapt to climate change. These adaptation strategies include protecting biodiversity and conservation areas (Article 5), promoting defence against floods and other disasters (Article 31), and advancing the adaptation of urban areas in high-risk areas (Article 31). Moreover, Law 1931 of 2018 (***Climate Change Law***) establishes that the Comprehensive Territorial Climate Change Management Plans (PIGCCT) shall include the development of ecosystem-based adaptation actions for inland, coastal marine and island ecosystems, as well as management tools for protected areas, according to their management category (Article 18).

3.2.2. ASSESSMENT OF ADAPTATION OPTIONS

When the list of adaptation options has been prepared, the next step is to prioritize between the various options based on detailed information and criteria. The identified options are assessed to determine their suitability to the local context, their effectiveness in reducing vulnerability and exposure or increasing coping and adaptive capacity, and their wider impact on sustainability. The analysis of costs and benefits can significantly assist decision makers in working out the best strategy for using scarce economic resources for the most effective adaptation approach and to help prioritize and time resilience investments. The objective of this step is to avoid decisions that lead to inappropriate actions or maladaptation.⁷³

Notably, this step finds favour in the Cancun Adaptation Framework, which encouraged countries to assess adaptation actions by considering economic, social and environmental factors.⁷⁴

The assessment should focus on factors such as the urgency of the climate risk, feasibility, financial costs, ease of integration into existing institutional arrangements and impacts on other social, environmental or economic objectives.⁷⁵ The ***New South Wales Coastal Management Act 2016***, in addition to calling for the identification of options, calls for their assessment based on among other things, their costs and the responsible implementing authority.

⁷³ See step 4 of Urban Adaptation Support Tool (Climate-ADAPT) <https://climateadapt.eea.europa.eu/knowledge/tools/urban-ast/step-4-0>

⁷⁴ Decision 1/CP.16, The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, UN Doc. FCCC/CP/2010/7/Add. 1., 15 March 2011.

⁷⁵ Ibid.

It provides that the coastal management programme should “identify the costs of those actions and proposed cost-sharing arrangements and other viable funding mechanisms” as well how and when those actions are to be implemented, including those

to be implemented by local councils, those to be implemented under environmental planning instruments and development control, and those to be implemented by other public authorities (Section 15.1 (c) and (d)).

3.2.3. PRIORITIZATION AND SELECTION OF ADAPTATION OPTIONS

The assessment of adaptation options is followed by the selection of the most suitable ones. This step recognizes that there could be a range of viable options and, as such, seeks to develop a ranking mechanism for arriving at the most effective ones and developing them into concrete actions. Some criteria to select the preferred adaptation options could be cost-benefit ratio,⁷⁶ time considerations, robustness under a broad range of likely future impacts, flexibility for adjustments or reversibility in case of diverging developments, political and cultural acceptability, and enhancement of learning and autonomous capacity, etc.

It is advisable to use a multi-criteria analysis which provides a structured approach to determine overall preferences among alternative options where the options accomplish several objectives.⁷⁷ A good example is Colombia's *Climate Change Law* (Law 1931 of 2018), which provides under Article 2.4 that priority will be given to the implementation of climate change adaptation options that bring the greatest beneficial impact for the population at the lowest cost or effort invested, and with the greatest social and economic benefits.

3.2.4. STAKEHOLDERS' ENGAGEMENT IN IDENTIFICATION AND PRIORITISATION OF ADAPTATION

The Paris Agreement underscores the need for adaptation actions that are “gender-responsive, participatory and fully transparent”, which consider “vulnerable groups, communities and ecosystems” and which take advantage of “traditional knowledge, knowledge of Indigenous Peoples and local knowledge systems”.⁷⁸ The importance of involving stakeholders in the identification and prioritization of adaptation options in urban plans cannot be overstated.

As a cross-cutting issue that affects almost every sector of a country's domestic policies, adaptation to climate change needs to be undertaken in a coordinated manner that takes advantage of cross-sectoral synergies and explores opportunities for achieving multiple-benefit simultaneously. A wide range of stakeholders may, for instance, propose options that not only promote adaptation but also support other goals, such as mitigation,

⁷⁶ Adaptation costs are understood to be the costs of planning, preparing for, facilitating, and implementing adaptation measures, including transition costs and the benefits are the avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures. See UNFCCC (2011). *Assessing the Costs and Benefits of Adaptation Options: An Overview of Approaches*.

⁷⁷ See step 4 of Urban Adaptation Support Tool (Climate-ADAPT) <https://climate.adapt.eea.europa.eu/knowledge/tools/urban-ast/step-4-0>

⁷⁸ Article 7.5.

disaster-risk reduction and better environmental management. Furthermore, expanding the stakeholder pool enables the use of traditional knowledge and indigenous practices of communities which carry a huge potential for cost effectiveness and efficiency of measures due to their possession of unique local

information on climatic and weather patterns and trends. In Australia, the ***New South Wales Coastal Management Act 2016*** provides that before adopting a coastal management programme, a local council must consult on the draft programme with the community (Section 16.1).

3.2.5. IDENTIFICATION OF INFRASTRUCTURE-BASED AND ECOSYSTEM-BASED ADAPTATION MEASURES

Adaptation may use both infrastructure-based and ecosystem-based measures depending on the climate risks involved, their urgency, costs, ease of implementation and capacity, among other factors. Infrastructure-based measures comprise “climate proofing” infrastructure and often include projects such as the construction of seawalls and river embankments, storm drainage systems, water supply and treatment plants, and relocating energy facilities. Ecosystem-based measures, on the other hand, harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience to climate change. Examples include conservation of wetlands, to absorb peak flows from floods, or the planting of protective mangroves to reduce the intensity of storm surges. While the most appropriate method to be adopted between the two is context-specific and depends on the range of listed factors, it is noteworthy that ecosystem-based measures have numerous benefits, including cost-effectiveness, conservation of biodiversity and generation of significant social, economic and cultural benefits in addition to building on traditional knowledge and practices of Indigenous Peoples and local communities.⁷⁹

The New York ***Community Risk and Resiliency Act 2014*** obligates the Department of Environmental Conservation and the Department of State to develop guidance on the use of resiliency measures that use natural resources and natural processes to reduce risk (Section 16). The ***New South Wales Coastal Management Act 2016*** is even more explicit, as it provides that the management objectives for the coastal vulnerability area are to encourage land use that reduces exposure to risks from coastal hazards, including through siting, design, construction and operational decisions, and to adopt coastal management strategies that reduce exposure to coastal hazards which should give preference to enhancing natural defences, including coastal dunes, vegetation and wetlands (Section 7.2). The Myanmar ***Natural Disaster Management Law 2013*** calls for both infrastructure- and nature-based adaptation measures, including “constructing embankments along the coast and in the flooded area” as well as the “preservation of mangroves along the coast and planting fast-growing trees” (Section 16).

79 UNFCCC. Technical Paper, Slow Onset Events, 26 November 2012, FCCC/TP/2012/7.

3.2.6. TARGETS TO IMPROVE THE ADAPTATION OF URBAN AREAS WITH MEASURABLE AND VERIFIABLE BENCHMARKS AGAINST WHICH PROGRESS CAN BE ASSESSED

In accordance with the Paris Agreement stipulation for countries to monitor, evaluate and learn from adaptation plans, policies, programmes and actions,⁸⁰ this part is concerned with finding out whether the preferred measures are achieving their intended objectives.

It requires the crystallization of actions into concrete targets with measurable and verifiable benchmarks against which progress can be assessed. Such an exercise would reveal the efficacy of agreed actions and provide the basis for additions, adjustments or cessation of certain actions based on their effects.

3.2.7. ASSESSMENT OF URBAN PLAN'S CONTRIBUTION TO ADAPTATIONS STRATEGIES

In addition to reflecting the most suitable options, it is advisable that urban plans include adaptation actions that result in "win-win" outcomes, i.e., they not only minimize identified climate risks but also make a significant contribution to local, sub-regional and national governments' climate change strategies, targets and measures. In this sense, the urban plans will be promoting both local climate resilience as well as compliance with international obligations.

Norway's *Regulations on Impact Assessments 2017* stipulate that an assessment of urban plans needs to be done to determine, among other things, its impact on nationally and internationally agreed environmental targets (Section 21).

⁸⁰ Article 7.9 (b)

3.3. IMPLEMENTATION OF THE IDENTIFIED ADAPTATION OPTIONS

3.3.1. RESTRICTIONS TO LAND USE AND DEVELOPMENT

A climate risk assessment may underscore the need to keep hazard-prone areas free from use and development through restrictions. Such restrictions may be total or partial. Total restrictions are recommended where extreme risk exists that is determined through a comprehensive risk assessment and consultation with affected communities. Partial restrictions are more common and often seek to prevent unsuitable land use and development in hazardous areas while permitting suitable ones. Examples include allowing agricultural use but not human habitation in flood zones; restricting development densities coupled with observance of certain technical requirements; or permitting development on the condition of developers covering the cost of required adaptation measures.

Denmark's *Planning Act 2007* provides that a local plan may contain provisions on keeping an area free from new construction if buildings may be exposed to collapse, flood or other damage that may endanger users' life, health or property (Section 15) and further calls for the country's coastal areas to be kept as free as possible of development and installations that do not need to be located near the coast (Section 5.a) Finland's *Planning and Building Act 1999* prohibits the construction of buildings in the shore area of the

sea or of a body of water without a local detailed plan or a legally binding local master plan which contains special provisions concerning use of the local master plan or a part thereof as the basis for granting a building permit (Section 72). In Dominica, restrictions are implemented through the creation of environmental protection areas. Under the *Physical Planning Act 2002*, an order declaring an area to be an environmental protection area may specify that only certain developments or classes of development are permitted; prohibit any development within the area; or permit the area to be used only for agriculture or forestry purposes (Section 57.3). In Maine, one of the objectives of the *Mandatory Shoreland Zoning Act* list is to "protect buildings and lands from flooding and accelerated erosion". To this end, it requires all municipalities to adopt, administer and enforce local ordinances to regulate land-use activities within 250 feet of great ponds, rivers, freshwater and coastal wetlands, and all tidal waters and within 75 feet of streams. According to Japan's *Act on Special Measures concerning Urban Reconstruction* (amended in 2018), local governments can designate areas as vulnerable to disasters such as floods, tsunamis and storm surges and prohibit construction of residential buildings in disaster red zones.

3.3.2. PUBLIC LAND BUFFER

A public land buffer is one of the mechanisms for preventing development in vulnerable and hazard-prone areas. It creates an area of land abutting sea or rivers which is public, i.e., state-owned.

The area of land between the sea or river and the demarcation line is thus vested in the government and cannot be developed or used by private individuals.

In South Africa, a public land buffer is implemented through the creation of “coastal public property” under the *Integrated Coastal Management Act 2009*, which provides that such an area may be created to protect sensitive ecosystems and to protect people, property and economic activities from risks arising from dynamic coastal processes, including the risk of sea-level rise (Section 8 and 9).

3.3.3. RIPARIAN SETBACKS

Setbacks are “building restrictions that establish a distance from a boundary line with which a landowner is prohibited from building or expanding structures”.⁸¹ Setbacks have two main advantages over traditional engineering structures. First, they are ecologically friendly in that they provide a buffer area that can simultaneously accommodate the naturally dynamic nature of the riverbeds and coasts. Second, unlike seawalls, setbacks are economical as they provide protection from the immediate impacts of flooding and storm waves without requiring huge financial outlays. The width of riparian setbacks should ideally be based on scientific assessments and projections.

3.3.4. COASTAL SETBACKS

Coastal setbacks are “prescribed distances to a coastal feature such as the line of permanent vegetation, within which all or certain types of development are prohibited”.⁸² South Africa’s *Integrated Coastal Management Act 2009* requires the provincial council to establish or change coastal set-back lines to protect coastal

In Colombia, Decree 2811 of 1974 introduces public land buffers through Article 320, which states that private individuals may be subject to easements between their property and hydrological systems. In addition, Article 330 states that “buffer zones will be determined in the periphery of the park system in order to preserve it for educational and recreational purposes”.

Examples of laws that establish riparian setbacks are Norway’s *Water Resources Act 2000*, which states that along the banks of river systems with a perennial flow, a limited natural belt of vegetation shall be maintained to counteract runoff and provide a habitat for plants and animals. The width of the belt is stipulated by municipalities or laid out in urban plans (Section 11). Kenya’s *Environmental Management Co-ordination (Water Quality) Regulations 2006* prohibits development activity or cultivation within a minimum of 6 metres and a maximum of 30 metres from the highest ever recorded flood level, on either side of a river or stream, and as may be determined by the National Environment Management Authority from time to time (Section 6 (c)).

public property, private property and public safety; to protect the coastal protection zone; to preserve the aesthetic values of the coastal zone; and to prohibit or restrict the building, erection, alteration or extension of structures that are wholly or partially seaward of that coastal set-back line (S25.1a & b).

81 Anne Siders (2013). *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away from Vulnerable Areas*. Columbia Centre for Climate Change Law, Columbia Law School.

82 Gillian Cambers (1998). *Planning for Coastline Change: Coastal Development Setback Guidelines in Antigua and Barbuda*. UNESCO.

Fiji's *Environmental Management Act 2005* requires all built development to have a 30-metre setback from the high-water mark. Notably, like riparian setbacks, these should be set based on scientific information. South Carolina's *Beachfront Management Reform Act 2018* offers a good example, as it requires the use of the best available scientific and historical data in the implementation of setbacks. The setback line is based on the average annual erosion rate calculated based on the best historical and scientific data adopted by the department as a part of the State Comprehensive Beach Management Plan (Section 4). In Spain, the **1988 Coastal Law** establishes a 100-metre setback line from the edge of the Marine Terrestrial Public Domain, although this is reduced to 20 metres in urban areas. These setbacks were retained by the **2013 Protection and Sustainable Use of the Coastline and Amendment of the Coastal Law**.

This law prohibits permanent developments within the setback zone.⁸³ In Italy, the coastal setback line is set at 300 metres from the shoreline. Development in this zone is restricted but not prohibited outright and is regulated by regional plans through landscape planning (*pianificazione paesaggistica*). Furthermore, the **Navigation Code** (Article 55) specifies that new works within 30 metres of the maritime domain or from the edge of the elevated land on the sea are subject to state authorization.⁸⁴ In Turkey, the setback zone takes the form of a "shore strip" introduced by the **Coastal Law 1992**. The shore strip has a width of 100 metres divided into two parts of 50 metres each. The first 50 metres (the area directly abutting the sea) is publicly owned while in the next 50 metres, tourism facilities for daytime use may be permitted subject to floor space and height restrictions.⁸⁵

3.3.5. INTEGRATED COASTAL ZONE MANAGEMENT PLANS

Integrated coastal zone management refers to "a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zones".⁸⁶ It seeks to involve all relevant sectors and stakeholders in coastal zones, with its primary aim being to balance "environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics".⁸⁷ Integrated coastal zone management plans are thus policy instruments meant to guide activities within the coastal zone, ensuring that sustainability is at the centre.

The purpose and scope of such plans are often stipulated in the law. For this part, integrated coastal zone management plans should integrate climate change adaptation considerations. For example, South Africa's **Integrated Coastal Management Act 2009** notes that integrated coastal zone management is necessary to protect the ecological integrity, natural character and the economic, social and aesthetic value of coastal public property; avoid increasing the effect or severity of natural hazards in the coastal zone; protect people,

83 Marta Lora-Tamayo (2021). Chapter 8: Spain. In Rachele Alterman and Cygal Pellach (eds.) *Regulating Coastal Zone: International Perspectives on Land Management Instruments*. Routledge.

84 Enzo Falco and Angela Barbanente (2021). Chapter 10: Italy. In Rachele Alterman and Cygal Pellach (eds.) *Regulating Coastal Zone: International Perspectives on Land Management Instruments*. Routledge.

85 Fatma Unsal (2021). Chapter 14: Turkey. In Rachele Alterman and Cygal Pellach (eds.) *Regulating Coastal Zone: International Perspectives on Land Management Instruments*. Routledge.

86 European Commission.

87 Ibid.

property and economic activities from risks arising from dynamic coastal processes, including the risk of sea-level rise; maintain the natural functioning of the littoral active zone; and maintain the productive capacity of the coastal zone by protecting the ecological integrity of the coastal environment (Section 17).

Barbados' *Coastal Zone Management Act 1998* requires the Director of the Coastal Zone Management Unit to prepare a draft coastal zone management plan which comprises policies, strategies and standards that provide for the management and conservation of

coastal resources, and may include standards for environmental impact assessment for development which may affect the resources (Section 3 and 4).

South Korea's *Coast Management Act 2009* also obligates the preparation of an integrated coastal management plan each decade in order to preserve, use and develop coasts in a comprehensive manner (Article 6). It particularly considers special management of the area where serious damage has occurred or is likely to occur due to coastal erosion (Article 20).

3.3.6. LOCATION OF ESSENTIAL INFRASTRUCTURE

Essential infrastructure is infrastructure related to water, sanitation, drainage, transport, coastal transport (seaports and coastal airports), energy, telecommunications or emergency infrastructure and critical facilities (hospitals). Such infrastructure is not only crucial to adaptation (e.g., water treatment and storage plants during drought), but also provides essential services during climate hazards (e.g., transport and communication infrastructure is vital during disaster response to climate-linked disasters such as hurricanes, typhoons and fires).

Furthermore, such infrastructure may exacerbate a situation that is already dire if struck by climate hazards (e.g., if a climate-linked fire occurs near a nuclear facility). Accordingly, urban planning frameworks should ensure that essential infrastructure is located outside high-risk areas. Vietnam's *Urban Planning Law 2009* provides that the base height and urban surface water drainage planning must indicate areas favourable for construction in urban centres, including areas where construction is banned and restricted, and measures for preventing and mitigating damage caused by natural disasters (Article 37.2).

3.3.7. CAPACITY OF WATER INFRASTRUCTURE

Increased precipitation is one of the most notable climate hazards identified by the IPCC. This fact calls for particular attention on the adequacy of water infrastructure. Heavy precipitation results in not only large-scale economic damage from direct destruction of buildings and infrastructure but also secondary economic damage that may

occur through power, data and telecom cuts as well as business and traffic interruption.⁸⁸ Moreover, heavy rainfall is an environmental and health risk where there is inadequate water capacity as storm water may seep into drinking water pipelines or enter the sewer system in such high volumes that the mixed storm water

88 Hens Runhaar (2018). "Mainstreaming climate adaptation: taking stock about what works from empirical research worldwide." Regional Environmental Change.

and waste water has to be discharged directly to the sea or a river system instead of being treated first.⁸⁹ This part thus seeks to promote planning of sewerage systems, storm drains and waste water treatment plants based on predicted rainfalls, flooding and densification. One of the objectives of the Welsh ***Sustainable Drainage Systems Standards 2018*** is to manage surface water runoff to protect people and property from flooding effects and to protect the receiving water body from morphological damage.

They use scientific projections to guide the location and capacity of water infrastructure. For instance, they provide that consideration should be given to likely future pressures on the site drainage system, such as increasing intensity of rainfall due to climate change. The standards further add that drainage solutions should consider historical information on all forms of flooding and groundwater levels during extended wet periods.⁹⁰

3.3.8. NATURE-BASED STORM WATER MANAGEMENT

Nature-based stormwater management entails using natural soil infiltration or drainage via open waterways and ponds rather than resorting to artificial solutions such as impermeable storm drains, which tend to intensify flooding in river systems causing more damage further downstream. A legal requirement to consider nature-based storm water management to manage increasing volumes of stormwater in already built-up and expansion areas may provide a more sustainable alternative. Norway's ***Water Resources Act 2000*** states that land should, as a general rule, be developed in a way that precipitation can continue to drain away by infiltration into the ground (Section 7). Accordingly, the ***Planning and Building Act 2008*** and the regulations on technical requirements for building works authorize municipalities to include stormwater management as a

consideration in land-use planning processes and when processing applications for new developments. The Welsh ***Sustainable Drainage Systems Standards 2018*** provide that surface runoff not collected for use should be discharged by infiltration to the maximum extent possible at any location across the site. In Colombia, a policy instrument (***CONPES 4004 of 2020***) states that Sustainable Urban Drainage Systems (SUDS) are to be considered and implemented by the National Planning Department (DNP) to deal with storm flooding: "the DNP, together with the Ministry of Housing, City and Territory, will publish in 2021 a methodological guide for the formulation and implementation of SUDS, in order to strengthen water management processes at the municipal level, as these types of systems allow the use and reuse of water" (Section 4.3.2).

3.3.9. CLIMATE VULNERABILITY IN LAND INFORMATION SYSTEMS

Climate risks may be avoided through awareness raising of the hazards associated with certain areas. Integrating vulnerabilities and exposure of land parcels to climate hazards in land information systems is one of the most effective

mechanisms to achieve this. Vulnerability information could include low elevation coastal zones, flood plains, fire-prone areas, zoning, and development and use restrictions. In the Netherlands, the ***Cadaster Law 2008*** provides

89 Climate change adaptation in Norway. Meld. St. 33 (2012–2013) Report to the Storting (white paper).

90 G2.5 and G2.6 under Guidance on Standard S2 - Surface water runoff hydraulic control available at <https://gov.wales/sites/default/files/publications/2019-06/statutory-national-standards-for-sustainable-drainage-systems.pdf>

the basis for the inclusion of various details in the land information system, including land tenure, value and use of land and buildings, as well as the existence of any environmental limitations regarding use. It has introduced an energy label to be attached during sale, letting or construction transactions of real estate. More notably in this context, this law supports land acquisition by the government for the implementation of anti-flooding measures.⁹¹

Some countries are integrating climate vulnerability information in local registers. For instance, the ***Flood and Water Management Act 2010*** of Wales requires a lead local flood authority to establish and maintain a register of structures or features which, in the opinion of the authority, are likely to have a significant effect on a flood risk in its area, and a record of information about each of those structures or features, including information about ownership and state of repair (Section 22).

3.3.10. EVACUATION ROUTES AND LOW RISK AREAS

Part of adaptation planning is the appreciation that, in extreme cases, people may need to be evacuated from risky areas. It is crucial that urban plans provide for accessible and functional evacuation routes and identify safe locations that may be used as temporary or even long-term settlements. Pursuant to the United Kingdom ***Planning and Compulsory Purchase Act 2004*** which introduced Local Development Frameworks, the London Borough of Richmond upon Thames has adopted a Development Management Plan that provides that flood warning and evacuation plans should be in place for those areas at an identified risk of flooding. It calls for developers to ensure that appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event and include how such plans will be implemented.

It further requires all major development proposals in areas at risk of flooding to submit a flood warning and evacuation plan. In Japan, ***the Flood Prevention Act 1949*** (amended by Act No. 109 of 2014) requires the Minister of Land, Infrastructure, Transport and Tourism (MLIT) and prefecture governors to designate areas along certain rivers as predictable areas prone to flooding (Article 14). It also adds that municipal governments with such areas within their jurisdictions must prepare systems for issuing flood warnings, designating evacuation spaces and listing facilities that need particular attention in case of floods, such as underground malls, care facilities for the elderly, the disabled, or children, and large factories. (Article 15.)

91 Diego Navarra and Paul Van Der Molen (2013). "A Global Perspective On Cadastres & Geo-ict For Sustainable Urban Governance In View Of Climate Change." *Architecture, City and Environment* 8 (24).

3.4. ADAPTATION OF SLUMS AND VULNERABLE SETTLEMENTS

It is estimated that almost a billion people live in slums with more than 881 million in developing countries alone.⁹² These settlements have been built outside the “formal” system of laws and regulations that are meant to ensure safe, resilient structures, settlements and systems. In addition to living under conditions characterized by inadequate access to safe water, sanitation, sufficient living space and insecure tenure, informal settlers also face the grave threat of climate change. They stand to be disproportionately affected due to three underlying factors. First, they are often located in environmentally fragile areas, such as steep slopes, floodplains, coastal shores, and riverbanks.

Second, the socio-economic characteristics of slum dwellers - high levels of poverty and illiteracy – mean that these communities have low capacity to deal with climate impacts. Third, slums often suffer from political and institutional marginalization by public authorities which refuse to legitimize their urban existence. Consequently, such areas often miss out on investments in risk reducing infrastructure.⁹³ Reducing the climate risks facing slums thus needs to start by integrating them into the broader urban fabric and improving the physical, social and economic environment of their occupants through upgrading.

3.4.1. URBAN PLANNING AND LAND MANAGEMENT TOOLS

Legal frameworks may play a crucial role in slum upgrading by providing specific planning instruments for this purpose. These tools recognize the reality of informality and seek to increase the resilience of slum dwellers, notwithstanding their frequent need to rely on irregular strategies. These tools may relate to land subdivision, land consolidation, land pooling/readjustment, land sharing, community land trust, land banks and transfer of development rights. In some countries, the urban planning mechanism used for slum upgrading is the declaration of “special planning areas” or “improvement areas”. This is the case in Kenya, Malawi, South Africa, Tanzania, Dominica, Zambia and Tanzania. Kenya’s *Physical and Land Use Planning Act 2019* provides for the declaration of a special planning area where

“the development of that area raises significant urban design and environmental challenges” (Section 52). In Malawi, an improvement area may be declared for “land developed primarily for residential purposes to a high density, or in an unplanned and unauthorized manner, or in a manner which makes further development or redevelopment of that land or adjacent land difficult to carry out, or in a manner detrimental to the environment of the area and the health of the residents of the area or adjacent areas” (*Section 63.1, Physical Planning Act 2016*). This law goes further to lay out the actions that may constitute slum upgrading following the declaration of an improvement area; these include the improvement of houses, the building or rebuilding of houses, the provision of roads, water and electricity in the area, the

92 UN-Habitat (2016). World Cities Report 2016.

93 UN-Habitat (2018). Addressing the Most Vulnerable First: Pro-poor climate action in informal settlements.

reallocation of land within the area to ensure a more beneficial occupation and a more suitable subdivision of the land, the demarcation of boundaries and the payment of compensation to residents of the area who suffer loss or inconvenience through the exercise (Section 63.2). The *Dominica Physical Planning Act 2002* envisages land pooling/readjustment by providing that a development plan may designate as a comprehensive planning area any area which needs to be planned as a whole

for one or more of the purposes of development, redevelopment, improvement or conservation (Section 9.4.e). In India, the *Gujarat Town Planning and Urban Development Act 1976* has been used to undertake various land readjustment projects which have promoted security of tenure for the urban poor, increased affordable housing units, provided infrastructure and basic services and regenerated historic cores.⁹⁴

3.4.2. FLEXIBLE PLANNING AND INFRASTRUCTURE STANDARDS

Urban planning law in some countries requires compliance with particular forms of land tenure, building forms and construction materials, which often embody standards imported from other countries and building technologies. Coupled with requirements for setbacks, minimum plot sizes, coverage, on-site parking, etc., these standards make it impossible for the urban poor to formally reside in urban areas as they are usually unaffordable for low-income households and often impractical in dense and highly populated slums.⁹⁵ Regulatory frameworks in such contexts thus need to be in tune with local realities for effective adaptation to climate change through slum upgrading. Flexible standards which uphold minimum standards for health and safety and enable informal settlers to lead a decent and productive life should be considered in the interim, with the possibility of scaling up to more complex interventions as capacity and resources increase.⁹⁶

Flexible planning and infrastructure standards may include lowering minimum plot sizes, allowing higher floor-space ratios, loosening height restrictions, or allowing greater density in specific target zones. Planning laws which provide for “special planning” or “improvement” areas often require special plans to be prepared for these areas. For instance, the Uganda *Physical Planning Act 2010* requires the Physical Planning Board to prepare a “special planning area physical development plan” for areas with “unique development potential or problems” (Section 24.3). Such plans may allow flexible standards provide for lower specifications than what is generally required in other areas. In Kenya, slum upgrading projects have benefited from this allowance based on special area plans.⁹⁷ The Zambia *Urban and Regional Planning Act 2015* makes it clear that the minister may provide for certain specifications in places declared as improvement areas (Section 31.2).

94 UN-Habitat (2013). Supply of Land for Development: Land Readjustment Experience in Gujarat, India.

95 UN-Habitat (2020). Human Rights, Rule of Law and the New Urban Agenda.

96 Ibid.

97 See the Kenya Informal Settlement Improvement Project (KISIP). <https://projects.worldbank.org/en/projects-operations/project-detail/P113542?lang=en&tab=overview>

3.4.3. COMMUNITY PARTICIPATION IN UPGRADING

Slum upgrading should involve meaningful community participation across the planning process. Gaining the support and the collaboration of informal settlers is essential for the success of interventions as it allows specific community needs to be factored into the process and promotes buy-in. Participation needs to include not only land and structure owners but also the residents (tenants), with special consideration for women, youth, disabled people and elderly people, among other marginalized groups. In Kenya, the declaration of a special planning area is followed by the preparation of a "special area plan" which, among other matters,

is required to stipulate how public participation and innovative approaches will be used in the planning and implementation process (**Section 53.h, Physical and Land Use Planning Act 2019**). The Act also requires renewal and re-development plans to contain "a report on citizen participation describing meaningful citizen participation in the planning process and expected citizen participation during project execution" (Second Schedule - Part C). In Malawi, once an improvement area order is made, the **Physical Planning Act 2016** provides for community participation through meetings and representations (Section 63.3).

3.4.4. COMMUNITY INVOLVEMENT IN SURVEYS AND ENUMERATIONS

A household enumeration is a census of housing and people living in a specific neighbourhood. It is important to ensure that participatory processes related to slum upgrading, such as surveys and household enumerations, have a strong community involvement and, preferably, are community-led to promote inclusivity and avoid capture by other interest groups. The **Kenya Slum Upgrading Bill 2019** requires the preparation of an inventory which maps and enumerates households to be done in a "participatory and inclusive manner".

Similarly, in India, the **Guidelines for Preparation of Slum Free City Plan of Action (2013-2022)** under the **Rajiv Awas Yojana** (RAY) programme, which envisages a slum free India with "inclusive and equitable cities in which every citizen has access to basic civic and social services and decent shelter", makes mapping and participatory enumeration a mandatory requirement for planning citywide slum upgrading.

3.4.5. ACCESSIBILITY TO BASIC SERVICES

As most slums are by nature "informal settlements", governments often do not provide them with services out of the fear that their recognition is an implicit endorsement of their informality (especially if the slums are on public land). For this reason, the practice in many states is to require applications for utility connections to be accompanied by formal proof of ownership or occupation (often in the form of a title deed or rental agreement).

As most informal settlers do not have these documents, they are inevitably excluded from formal/official service provision and are forced to access those services informally at a higher cost and lower quality. Accordingly, there is need for legislative reform in these areas to establish measures to ensure that everyone enjoys the right to basic services such as water, sanitation and energy as well as eliminate legal provisions and requirements that hinder people from such access.

It should be possible to access water, sanitation and electricity based on the provision of not only formal tenure rights documents but also customary and non-documentary forms, such as oral lease agreements, occupancy certificates, neighbours' statements etc. Zambia's *Urban and Regional Planning Act 2015* recognizes occupancy licences – valid for 30 years - which grant holders rights over the land to which the licence relates (Section

30). The occupancy licences enable holders to access services since they are considered to be adequate proof of proprietorship. Belgium also offers a good example through the *decree regarding the tariffication and general conditions of the public distribution of water in the Walloon region, 2004*, which provides that “any person holding an interest in immovable property is entitled to connect the property to the public water supply network”.

3.4.6. AFFORDABILITY OF THE UPGRADED SETTLEMENT

Slum upgrading efforts always carry the risk that the new/refurbished settlements may be unaffordable to the pre-existing residents. This is often the case where substantial public resources have been expended on the project and the government is seeking to recoup part of its investment by opening up the area and offering to sell some units to other beneficiaries, or where the informal settlers are required to cover part of the upgrading costs (such as through loans) which prove to be too high for them. In both cases, the original settlers are often pushed out by wealthier households that can afford to buy most of the units or pay back the loans. As such, the poorest are displaced and in their bid to find affordable housing, resort to settling in even riskier settlements. For slum upgrading to serve its intended function,

legal frameworks thus need to ensure that the upgraded settlement remains affordable for pre-existing communities. Measures to prevent economic displacement in the context of upgrading include the requirement to build affordable housing; community saving schemes and provision of subsidies to help the settlers cover the upgrading costs; imposition of maximum rental fees to maintain affordability; and temporary limitation of the right to sell to outside parties. A good example is Zambia's *Urban and Regional Planning Act 2015*, which seeks to prevent economic displacement of pre-existing communities by requiring that any sale or transfer of property within the improvement area must be approved by the local authority in whose jurisdiction the land is situated (Section 33).

3.5. PLANNED RELOCATIONS

A climate risk and vulnerability assessment may conclude that the most effective protection measure for a particular community is their relocation to a new region which is safe from climate hazards. Planned relocation involves “a process in which persons or groups of persons move or are assisted to move away from their homes or places of temporary residence, are settled in a new location, and provided with the conditions for rebuilding their lives”.⁹⁸ Planned relocations can be undertaken preemptively (e.g., before a disaster strikes, or as a measure to avoid the longer-term impacts of climate change) or remedially (e.g. following a disaster). They may also be used as a strategy to avoid future displacement; for example, when areas are highly disaster-prone or too dangerous for human habitation, when the impacts of climate change are expected to make life unsustainable in particular areas, or when the return of original habitats is not possible.⁹⁹ The role of planned relocation in the climate change context is recognized by the Cancun Adaptation Framework, which calls on states to enhance adaptation action by undertaking “measures to enhance understanding, coordination and cooperation with regard to climate change-induced displacement, migration and planned relocation”.¹⁰⁰

Accordingly, this Toolkit includes planned relocations as one of the important elements of adaptation in urban contexts. This part is influenced by the fundamental principle that planned relocation should always be a context-specific measure of last resort, based on consent and participation of affected communities and without compromising their security of tenure.¹⁰¹ Planned relocations should only be implemented when no other means of adaptation are available to enhance the population’s resilience and ability to remain in their original settlements, or when adequate alternatives that enable people to rebuild their lives in their communities of origin are unavailable. They should also be underpinned by a sound legal and scientific basis upon which the determination of the necessity of relocation is made in a process that fully protects, respects and responds to the rights and needs of affected populations.¹⁰²

98 UNHCR (2017). A Toolbox: Planning Relocations to Protect People from Disasters and Environmental Change. Georgetown University and IOM.

99 Brookings Institution, Georgetown University and UNHCR (2015). Guidance on Protecting People from Disasters and Environmental Change through Planned Relocations.

100 Cancun Adaptation Framework, 14 (f).

101 Convention 169 of the ILO stresses the absolute last-case scenario of relocation of Indigenous and traditional communities, which should be subjected to free, prior and informed consent due to their deep bonds to the land and because relocation can lead to loss of culture, belonging and history.

102 Brookings Institution, Georgetown University and UNHCR (2015). Guidance on Protecting People from Disasters and Environmental Change through Planned Relocations.

3.5.1. LAND FOR RELOCATIONS

The term “planned relocation” implies that the process entails a level of foresight and “planning”. Among the central tenets of the planning process is ensuring that suitable land has been identified and, if necessary, set aside for when it might be needed for planned relocations. Ideally, the land needs to be located close to the places of origin and have the ability to generate livelihoods for the relocated community. Some countries have already envisaged the provision of land in their legislation. In Papua New Guinea, the *Manam Resettlement Authority Act 2016* provides that one of the functions of the authority is to identify and acquire land for resettlement of displaced populations. In Kenya, the *Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities*

Act 2012 (IDP Act) notes that government bears the “primary duty and responsibility to designate, where necessary, official areas for the settlement of internally displaced persons in the republic” (Section 11.5.a). Colombian *Territorial Development Law* (Law 388 of 1997) requires that zoning plans include “*mechanisms for the relocation of human settlements located in areas of high risk to the health and integrity of their inhabitants*” (Article 13). *Decree 1807 of 2014* also requires that in areas where the risk cannot be mitigated, the houses and buildings to be resettled must be identified in detail, in addition to the stabilization works necessary to prevent the influence of the phenomenon under study from increasing (Article 20).

3.5.2. SAFETY OF THE RELOCATION SITE

Planned relocation may be counter-productive if the new site increases or fails to reduce the vulnerability of affected communities. Considering that planned relocations often have disruptive effects on housing, livelihoods and social networks, it is critical to ensure that the relocated community does not face further climate risks or is forced to move again due to other hazards.

Efforts must be made to guarantee the safety of the relocation site if planned relocations are to be an effective climate change-adaptation and disaster risk-reduction mechanism. Fiji offers a good example through the *Planned Relocation Guidelines 2018*, which require “actions to ensure a climate-resilient environment at destination, including climate-proof infrastructure [and] alternative green energy”.

3.5.3. RESETTLED AND HOST COMMUNITIES' PARTICIPATION

Both resettled and host communities should be informed, consulted and enabled to participate in decisions on whether, when, where and how a planned relocation is to occur. Culturally appropriate consultative, participatory structures need to be in place to enable all sectors of a community to make informed choices and to communicate these in a transparent process.

Planned relocation should ensure the meaningful participation of stakeholders at every step of the planned relocation process, including the decision to relocate, site selection, timing and modalities of relocation, and should involve all factions within stakeholder groups (such as the elderly, people with disabilities, women and children).

Furthermore, as planned relocation has the potential to exacerbate underlying tensions in communities and spark frictions and conflicts over resources such as land, water and pastures, thereby unsettling the social geometry in both relocation sites and places of origin, the participation of host communities is also essential to a successful process.¹⁰³ Facilitating the participation of both relocating and host communities can temper or allay these outcomes, as does ensuring that host communities also receive benefits from the process of planned relocation.

3.5.4. RELOCATION SITE FACILITIES

Planned relocations should be a process of rebuilding and integration, enabling people to settle sustainably in a new location.¹⁰⁴ It should, at a minimum, restore the living standards of relocated individuals and communities. To be sustainable, planned relocation should provide affected populations with suitable land and housing, access to public services like water, sanitation, electricity, and transportation, and access to social services like education and health and sources of income, livelihood/employment opportunities.¹⁰⁵ These facilities should also be accessible to host communities to promote integration and harmony in the resettlement areas. The *Manam Resettlement Authority Act 2016* (Papua New Guinea) obligates the authority to provide services and infrastructure for the resettlement area, including building access roads, an airstrip, schools, aid posts and ensuring a safe water supply; and to ensure that the human rights of displaced persons and the members of the host communities are protected.

¹⁰³ Ibid.

¹⁰⁴ UNHCR, Georgetown University and IOM (2017). *A Toolbox: Planning Relocations to Protect People from Disasters and Environmental Change*.

¹⁰⁵ Brookings Institution, Georgetown University and UNHCR (2015). *Guidance on Protecting People from Disasters and Environmental Change through Planned Relocations*.

The *Fiji Planned Relocation Guidelines 2018* require the government to collaborate with the affected communities and ensure the diverse needs of the community are integrated in preparing and elaborating the relocation plan; this should be by initiating a real dialogue with the affected population and putting in place measures to remove obstacles to participation and to capture the views of differently affected groups.

Similarly, the *Fiji Planned Relocation Guidelines 2018* also tasks government stakeholders with fulfil basic human rights, including the right to water, the right to food, the right to health, the right to work, the right to education and the right to a clean and healthy environment of affected communities. The guidelines also call for measures intended to promote access to financial resources, diversification of livelihood and new economic opportunities. Moreover, they include facilities for both relocated people and host communities by providing that if the relocation site is in a previously occupied area, additional infrastructure, including shelter, schools, medical facilities and livelihoods, should be provided.

3.6. SECURITY OF TENURE

Lack of tenure security undermines the effectiveness of adaptation actions in urban contexts by increasing the sensitivity of affected populations. It increases the risk of displacement from loss of land rights which may push communities into even more risky zones. It restricts access to public infrastructure and services as in some countries proof of formal titles is required.¹⁰⁶ The adaptive capacity of residents is also inhibited by tenure insecurity as persistent threats of evictions discourage them from investing in more resilient housing.

3.6.1. RECOGNIZED TENURE FORMS

Land tenure refers to the various relationships between people and land. It involves rules, practices and beliefs that define conditions of access to, use of, control over and disposal of land. Land tenure is seen as existing in binary forms: formal/informal, legal/extra-legal, or **de facto/de jure**. This view ignores the wide and complex spectrum of appropriate, legitimate tenure arrangements that exist between these extremities, which range from various and sometimes overlapping rights of use to conditional or full rights to dispose of the land.¹⁰⁹ The binary approach to land tenure has been reflected in legal systems through a preference of registered freehold and formalized individual land rights as the ultimate form of land rights rather than being seen as one among many forms of tenure.

Furthermore, lack of formally recognized land rights may exclude informal settlers from compensation or disaster-recovery funding, which may undermine planned relocation efforts.¹⁰⁷ Security of tenure is thus a critical component of not only adaptation but also the realization of sustainable and inclusive urban development as recognized by the NUA, which also calls for cities and human settlements that “fulfil their social function, including the social and ecological function of land”.¹⁰⁸

Consequently, many countries give recognition to freehold tenure and formalized individual land rights to the exclusion of the other forms, which affects the rights of informal settlements women, children, and other vulnerable groups.

To address these gaps, this Tool advocates for the “continuum of land rights” concept, which recognizes a variety of rights ranging from informal rights on one end of the spectrum to formal rights on the other.¹¹⁰ In between, there are occupancy rights, customary, leasehold and group tenure, among others, and include both individual and collective rights. Namibia offers one of the best practices in this area.

106 UN-Habitat (2020). Human Rights, Rule of Law and the New Urban Agenda.

107 UN-Habitat (2019). Land Tenure and Climate Variability.

108 Para 13 (a) and Para 14 (b).

109 UN-Habitat (2008). Secure Land Rights for All.

110 UN- Habitat (2012). Handling Land: Innovative Tools for Land Governance and Secure Tenure.

The *Flexible Land Tenure Act 2012* explicitly notes that its main objective is to create alternative forms of land title that are simpler and cheaper to administer than existing forms of land title, and to provide security of title for people who live in informal settlements or who are provided with low-income housing (Section 2). Several other countries recognize different tenure forms in their legal framework, including occupancy rights, customary and leasehold in addition to freehold.

The Zambian *Urban and Regional Planning Act 2015* gives local authorities the power to issue occupancy licences to informal settlers (Section 30.2), and the *Lands Act 1995* recognizes customary and leasehold tenure (Section 7 and 8). The rights are also provided for under Nigeria's *Land Use Act 1990* (Section 5 and 6).

3.6.2. LAND TENURE REGULARIZATION

Security of tenure may be promoted through land regularization. This is a deliberate process by which informal tenure and unauthorized settlements are integrated into the official, legal and administrative systems of land management. The regularization process is two-fold: juridical/administrative (tenure regularization) and the physical (material regularization). In tenure regularization, the process often starts with the delivery of an administrative permit to occupy that can be conditionally upgraded to a leasehold and, at a later stage, to a long-term registered freehold. Namibia's *Flexible Land Tenure Act 2012* provides for the creation of a simple land tenure form beginning with a "starter title" which may then be upgraded to a "land hold title" and later to full ownership (Section 14 and 15).

In Kenya, regularization has taken place in the context of slum upgrading through the *Land Act 2012* and the *Land Registration Act 2012*. Where informal settlers occupy public land, these two laws have been used to convert public land to private land or to community land followed by proprietary documents. Regularization has also been done in Colombia through the *Public Policy for the Integral Improvement of Neighbourhoods (CONPES 3604/2009)*, which has been used by the Ministry of Housing to improve the living conditions of the urban poor.¹¹¹ Colombian *Law 1001 of 2005* also introduced crucial legislation to help occupants of informal settlements on public land to obtain property rights and proof of ownership, provided they had settled on such land prior to 30 November, 2001.

3.6.3. MULTIPLE TENURE FORMS AND LAND INFORMATION SYSTEM

Registration of land rights in public records is a crucial component of secure tenure. It gives the beneficiaries a degree of certainty and security, and a legitimate expectation of legal protection.¹¹²

It has also been argued that registered property increases investments on land and promotes access to credit,¹¹³ which can be used to provide resilient infrastructure and more durable housing in vulnerable areas.

111 UN-Habitat (2020). Human Rights, Rule of Law and the New Urban Agenda.

112 Tim Hanstad (1998). "Designing Land Registration Systems for Developing Countries.", 13. American University International Law Review 3.

113 Hernando De Soto (2000). The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else. Basic Books.

The *Namibia Flexible Land Tenure Act 2012* establishes Land Rights Offices and requires the Registrar of Deeds to establish a land hold title register and a starter title register, and it creates a general duty to register all types of tenure forms (Sections 4-7). In Mexico, the legal framework recognizes both private and communal land ownership. The latter is particularly associated with the *ejido* system through which the customary system of land has been integrated into the statutory system.

3.6.4. EVICTIONS

Forced evictions are permanent or temporary removal against their will of individuals, families and communities from the homes or land which they occupy, without the provision of, and access to, appropriate forms of legal or other protection.¹¹⁵ Evictions may exacerbate the negative effects of climate change as they not only deprive people of housing but also threaten their access to health, education, food, livelihoods and even the right to life, especially when evictions are carried out through violence. Such evictions not only affect proprietary interests of the targeted individuals but also destroy their social networks, personal identities and access to employment. Furthermore, they have a disproportionate impact on the most vulnerable and already marginalized groups. Women, girls, children, disabled people, refugees, migrants and the poor face the brunt of such actions.¹¹⁶

Pursuant to the *Agrarian Law*, multiple tenure forms have been registered and recorded in the land information system. This process has resulted in the issuance of certificates falling within the three regimes of customary land tenure in Mexico: (a) usufruct rights to the commons within an *ejido*, (b) usufruct rights to an individual parcel usually used for agriculture, and (c) private rights to a housing lot within the urban zone of the *ejido*.¹¹⁴

Legal frameworks should try to prevent instances of forced evictions through security of tenure for all. In cases where people must be evicted, the process should involve certain safeguards. These include preparation of an eviction impact assessment, extensive consultations with the affected people and effective recourse mechanisms for those who are adversely affected by the eviction decision.¹¹⁷ The process of conducting the evictions also needs to be stipulated in the law.

South Africa's *Prevention of Illegal Eviction From and Unlawful Occupation of Land Act 1998* lays out procedural and substantive guidelines for evictions. In addition to all evictions being court-ordered, the court has the obligation to consider all relevant circumstances and be ordered only if they are just and equitable. Eviction matters cannot be heard *ex parte* and summarily determined.

114 UN-Habitat (2015). *Ejido Land Tenure and Registration System: Mexico Case Study*. Available at: <https://glt.n.net/download/ejido-land-tenure-and-registration-system-mexico-case-study-synthesis-report-eng-2015/?wpdmdl=8127&refresh=605ac404eda2d1616561156>

115 Committee on Economic, Social and Cultural Rights, general comment No. 7 (1997) on the right to adequate housing: forced evictions.

116 UN-Habitat (2020). *Human Rights, Rule of Law and the New Urban Agenda*.

117 Guiding Principles on Internal Displacement (E/CN.4/1998/53/Add.2); Basic principles and guidelines on development-based evictions and displacement (A/HRC/4/18, annex I).

All the relevant circumstances must be presented before the court, with the most important one being whether occupiers, including unlawful ones, have alternative accommodation. The Kenya **Land Act 2012** offers a good example of mandatory procedures meant to protect the welfare of communities facing evictions. It provides that all evictions must be preceded by the presentation of the formal authorizations for the action; where groups of people are involved, government officials or their representatives are to be present during an eviction; evictions be carried out in a manner that respects the dignity, right to life and security of those affected; special measures be included to ensure effective protection for groups and people who

are vulnerable, such as women, children, the elderly, and people with disabilities; special measures be included to ensure that there is no arbitrary deprivation of property or possessions as a result of the eviction; mechanisms be included to protect property and possessions left behind involuntarily from destruction; there is respect for the principles of necessity and proportionality during the use of force; and give the affected people the first priority to demolish and salvage their property (Section 152G). The evictions must also be preceded by a three-month notice to the affected people, in writing, by notice in the Government Gazette, in one newspaper with nationwide circulation and by radio announcement (Section 152C).

3.6.5. LAND ACQUISITION AND COMPENSATION

Public authorities at times need to acquire land for various purposes. These may be to expand infrastructure, provide affordable housing or create public spaces. Climate risks could also motivate governments to acquire land in the vulnerable area – and effectively lock out any private development to prevent disasters. In all these cases, it is recommended that legal frameworks consider and compensate loss of not only formal rights, but also the informal rights of settlers who often depend on such settlements for housing, livelihoods and social support systems. An example is the Kenya **Constitution 2010**, which provides that acquisition of land must be preceded by prompt compensation to the interested holder and gives the affected person the right to challenge the expropriation decision or valuation in a court of law. It also allows compensation to be paid to occupants in good faith who may not hold title to the land (Article 40). This provision may potentially be applied to compensate holders of formal rights as well as informal settlers.

The Malawi **Physical Planning Act 2016** makes it clear that informal settlers are entitled to compensation for loss of land rights or inconvenience due to slum upgrading. It stipulates that there shall be a right to the payment of compensation where a person is required to move from his or her house, either permanently or on a temporary basis, and take up residence elsewhere in the exercise of powers under an improvement area order (Section 68.1).

The Sierra Leone **Public Lands Act 1960** also entitles compensation to not only “owners” but also “occupiers” of land that is being appropriated, which includes the value of the land as well as for any damages sustained as a result of the process (Section 15). Colombia’s **Territorial Development Law** (Law 388 of 1997) ensures at its article 67 that owners shall be paid equal to commercial appraisal during expropriation.

Moreover, *Decree 4.830 of 2008* establishes the value of the *Family Subsidy for Rural Social Interest Housing*, which will be between 10 and 18 monthly current legal minimum wages, in accordance with the projects presented by the

territorial entities (Article 3). This subsidy can be used for the construction or acquisition of new housing or for basic improvements to the house or sanitation system.

3.6.6. LAND AND PROPERTY DISPUTE TRIBUNAL

The centrality of land to the social and economic well-being as well as the sense of identity for many individuals and communities makes disputes and conflicts likely. Such disputes often lead to the loss of land rights of some members at the expense of others. As security of tenure has been shown to be essential to climate change adaptation, it is important that legal frameworks ensure that dispute resolution-mechanisms are not only available, but also that they are accessible to all. Furthermore, unresolved disputes lead to blockages in urban interventions. Effective dispute resolution is essential to enforce rights, hold institutions accountable on procedural and substantive rights, and to ensure the smooth implementation of plans, informal settlements upgrading, planned relocations and implementation of adaptation options.

In Kenya, the *Environment and Land Court Act 2011* creates the Environment and Land Court, which has original and appellate jurisdiction to hear and determine all disputes relating to environment and land. These include disputes relating to environmental planning and protection, climate issues, land-use planning, title, tenure, boundaries, rates, rents, valuations, compulsory acquisition of land, and land administration and management (Section 13). The jurisdiction of the court is reiterated by the *Land Act 2012* (Section 128). In Nigeria, the *Land Use Act 1990* creates Land Use and Allocation Committees which are tasked with determining disputes related to compensation. Article 69 of Colombian *Territorial Development Law* (Law 388 of 1997) provides for an appeal mechanism related to expropriation decisions.

3.6.7. ALTERNATIVE DISPUTE RESOLUTION MECHANISMS

In addition to the formal justice system, the legal framework should recognize and encourage alternative dispute resolution (ADR), as the formal court system often includes lengthy and costly processes laced with complex procedures that limit access for most of the population. The formal court system is often technical in nature and obliges litigants to be represented by lawyers, thus making it more expensive. Furthermore, especially in common law jurisdictions, it is adversarial in nature and results in a win-lose outcome for the disputants.¹¹⁸

These factors hinder access to justice for many, especially the urban poor, ethnic minorities, Indigenous Peoples, irregular migrants, internally displaced persons (IDPs) and women. In contrast, ADR has several advantages. It is relatively speedy, less costly, more flexible and has fewer technicalities. It involves disputing parties in the dispute-resolution process, has the potential to result in a win-win situation, thus preserving the parties' relationships post-dispute and, in some cases, gives the parties the choice of selecting arbiters.

118 Marc Galanter (1974). "Why the "Haves" Come out Ahead: Speculations on the limits of legal change", (1974), 9 Law & Society Review 1.

As opposed to the public nature of court cases, it also offers privacy to the parties. These benefits make ADR an attractive option for the vindication of rights provided it guarantees equity,¹¹⁹ the respect of the law and transparency.¹²⁰ Indeed, most victims of land rights loss often belong to the most marginalized and discriminated groups. ADR ensures that the affected have access to remedies in the context of land disputes. The Kenyan **Constitution 2010** encourages communities to settle land disputes through recognized local community initiatives (Article 60.1) and provides for the use of alternative forms of dispute resolution, including reconciliation, mediation, arbitration and traditional dispute-resolution mechanisms (Article 159.2).

The **Land Act 2012** reiterates these principles under Section 4.2, where encouragement of communities to settle land disputes through recognized local community initiatives and alternative dispute-resolution mechanisms in land dispute handling and management are listed as guiding values and principles. Alternative forms of dispute resolution are also encouraged under the **Community Land Act 2016**, where the land in question forms part of community land (Section 3).

119 Heinrich Böll Stiftung Foundation regarding ADR mechanism called TAC in Brazil, <https://br.boell.org/pt-br/2015/01/12/negociacao-e-acordo-ambiental-o-termo-de-ajustamento-de-conduta-tac-como-forma-de>

120 Albert Fiadjoe (2004). *Alternative Dispute Resolution: A developing world perspective*. Cavendish Publishing Limited.

3.7. IMPLEMENTATION OF CLIMATE ADAPTATION STRATEGIES THROUGH DEVELOPMENT APPROVAL

Development control is the process through which authorities manage the nature and extent of land development. It is meant to ensure that development occurs in appropriate locations; is consistent with the protection of the environment and natural resources; buildings are structurally sound; and structures are equipped with the basic services and facilities necessary to support the purpose for which they are erected. Developers are typically required to seek authorization prior to undertaking activities - including land subdivision, land consolidation, rezoning applications and neighbourhood plans - by applying for permission from the local authority.

Development control is a valuable tool in this context as it ensures that planning and design standards for adaptation to climate risks and vulnerabilities are implemented, monitored and enforced through the development approval process. It can be used to prevent development in risky areas (by denying permission to such proposals); force developers to include adaptation infrastructure; and promote environmental integrity. This part focuses on four main issues that are deemed to be central to the efficacy of development control for climate change adaptation.

3.7.1. CRITERIA FOR APPROVAL AND ADAPTATION

For development control to be effective in implementing climate adaptation strategies and priorities, it must be linked to legally approved urban plans, zoning regulations and standards that are based on relevant climate information, including evidence from climate risk and vulnerability assessments. The criteria may, for instance, require that an application for planning permission show that the site is fit for building; or that the developer provide various facilities to ensure safety of occupants in case of a climate hazard; or that the development will not lead to the destruction of natural features essential for adaptation (e.g., through mandating an EIA). For instance, the criteria provided under the Mauritius *Planning and Development Act 2004* require applications for a development permit to be accompanied by an EIA licence or an approved preliminary environmental report.

The Act further obligates the permit authority to have regard to the natural environment of the area; the conservation of the built environment in the area; and the suitability of the site for the development when considering applications (Section 30). The Samoa *Planning and Urban Management (Environmental Impact Assessment) Regulations 2007* provides for an EIA where the development application and its associated activities could give rise to adverse impacts in conjunction with natural hazard risks; adverse impacts in the coastal zone; and adverse impacts associated with land instability, coastal inundation, or flooding (Section 5).

Similarly, the criteria for granting building permission in Tonga under the *National Spatial Planning and Management Act 2012* includes the potential environmental effects of the proposal, the sustainability of the proposed development; the suitability of the site for the proposed development, including consideration of natural hazards such as flooding, earthquake, cyclone, subsidence, slip, drainage and erosion;

the provision of private and public open space; and proposed safety features of the development, including fire safety features (Section 41). The *Planning and Facilitation of Development Act 2014* of Trinidad and Tobago follows this route by requiring planning authorities to consider any disaster mitigation information relevant to the area to which the application relates (Section 35.1.d).

3.7.2. DEVELOPERS' CONTRIBUTION FOR ADAPTATION INFRASTRUCTURE

Infrastructure is essential for a country's social and economic activities and is a huge determinant of the quality of life led by its people. This includes transport, water, waste, communication and energy infrastructure. In the context of climate change, such infrastructure must not only be resilient to current and future risks but must also aid the resilience of populations, economies, assets and livelihoods. New developments often lead to a heavier burden on urban authorities with regards to infrastructure and service provision. To avoid overwhelming public authorities, especially in resource poor contexts, part of this burden may be shifted to the developers at the development approval stage. This shift is necessary to ensure that private development is not subsidized with public funds and that the developers contribute to the costs that their development produces. Legal frameworks may allow authorities to charge developers for infrastructure costs associated with the development, either in monetary or in kind, through conditions attached to the planning permission.

Examples of infrastructure costs include construction of green areas, provision of land for infrastructure, construction of stormwater infrastructure, construction of sewerage infrastructure, construction of water infrastructure. Samoa offers an apt example as the *Planning and Urban Management Act 2004* provides that where the proposed development will or is likely to increase the demand for public amenities and public services within the area, the agency may grant consent to the application, subject to a condition requiring the dedication of land free of cost; the payment of a monetary contribution; or both (Section S49.1). The Mauritius *Planning and Development Act 2004* also allows conditions to be attached to the granting of planning permission, including a financial contribution which is to be used to provide infrastructure, public utility services, roads, car parking and social and community facilities in connection with the development; actions to prevent environmental damage from the development; and the preservation of trees and other natural resources (Section 32).

3.7.3. COMPLIANCE MONITORING AND ADAPTATION

An effective development control system needs to include mechanisms to monitor compliance with the approved development and its conditions.

Zambia's *Urban and Regional Planning Act 2015* calls for the appointment of planning inspectors tasked with monitoring whether developers are complying with the conditions upon which permission was granted (Section 63).

Malta's *Development Planning Act 2016* gives prescribed public officials the right to enter any premises at all reasonable times to inspect or survey land, or verify whether an illegal development or activity is taking or has taken place (Section 94.1).

The Malawi *Physical Planning Act 2016* also gives authorized officers the power to enter any land or building to inspect or survey for the purpose of preparing a plan or determining whether any unauthorized development is being or has been undertaken on the land or in the building (Section 95.1).

3.7.4. COMPLIANCE ENFORCEMENT AND ADAPTATION

To ensure that development control achieves its climate change adaptation objectives, it is essential that compliance mechanisms exist. These are necessary if developments are not compliant with the submitted application and its conditions. The planning inspectors under the Zambian *Urban and Regional Planning Act 2015* have the power to issue an "enforcement notice" to compel developers to abide by certain conditions. Failure to comply with such a notice is a criminal offence. The Act also allows revocation of planning permission if the planning permission was obtained through fraud, misrepresentation, non-disclosure of a material fact or submission of incorrect information; or if the development permit no longer conforms to the development plan (Section 64). Saint Lucia's *Physical Planning Act 2002* also provides for service of an "enforcement notice" and a "stop notice" where development is occurring without the grant of permission, or the developer has not complied with any condition subject to which permission was granted (Section 37-39).

Enforcement in Malta is also carried through "enforcement notices" which are issued under the *Development Planning Act* where development is being carried out without permission or is taking place without adherence to accompanying conditions. Authorities also have the right to enter the site and take steps to enforce the order, including disabling or removing of equipment, machinery, tools, belongings, vehicles, or other objects that may be on site and to carrying out of any works necessary to comply with what is requested in the enforcement notice (Section 97-100). Similar provisions also exist under the Malawi *Physical Planning Act 2016*,¹²¹ Tonga's *National Spatial Planning and Management Act 2012*,¹²² Samoa's *Planning and Urban Management Act 2004*,¹²³ and Tanzania's *Urban Planning Act 2007*.¹²⁴

121 Section 55-59

122 Sections 66 and 67.

123 Sections 81 and 82.

124 Section 74.

TABLE 3. Urban Planning and Design for Adaptation

Climate risks and vulnerability for planned areas and infrastructure	3.1 Does your country have provisions of law or regulations that require the consideration of climate risks and vulnerability for planned areas and infrastructure?		
	i.	Do these include the requirement to produce climate risk and vulnerability assessments to assess current and estimated future vulnerabilities and risks as part of the urban planning process?	Yes/No
	ii.	Do these include legal requirements concerning methods and processes to conduct risk and vulnerability assessments?	Yes/No
	iii.	Do these include the requirement to conduct inclusive and participatory vulnerability assessments?	Yes/No
	iv.	Do these include a list of potential climate hazards that need to be identified in the risk and vulnerability assessments?	Yes/No
	v.	Do these include a legal requirement to identify the places where climate hazards are most likely to occur through climate hazard maps?	Yes/No
	vi.	Do these include the requirement to identify people, property and economic sectors exposed to risks arising from climate change?	Yes/No
	vii.	Do these include the requirement for hazard maps to be publicly accessible?	Yes/No
	viii.	Do these include the requirement that hazard maps need to be reviewed at least every 10 years?	Yes/No
ix.	Do these include the legal requirement to assess the climate vulnerability of urban plans and infrastructure through environmental impact assessments or strategic impact assessments?	Yes/No	
Identification and prioritization of adaptation options	3.2 Does your country have provisions of law or regulations on how to identify and prioritize adaptation options for the risks and vulnerabilities identified?		
	i.	Do these include the requirement to determine available adaptation options for the identified risks and to describe them in detail?	Yes/No
	ii.	Do these include the requirement to assess the identified adaptation options based on time, cost, benefits and barriers to implementation?	Yes/No
	iii.	Do these include the requirement to prioritize the adaptation options and select the preferred ones?	Yes/No
	iv.	Do these include the legal requirement for stakeholders' engagement in the process of identification and prioritization of the adaptation options?	Yes/No
	v.	Do these include the legal requirement to identify both infrastructure-based and ecosystem-based adaptation measures?	Yes/No
	vi.	Do these include the legal requirement to have targets to improve the adaptation of urban areas with measurable and verifiable benchmarks against which progress can be assessed?	Yes/No
	vii.	Do these include provisions that require the assessment of the urban plan's ability to meet the local, sub-regional and national governments' climate change strategies, adaptations targets and measures?	Yes/No

Implementation of the identified adaptation options	3.3 Does your country have provisions of law or regulations to facilitate implementation of the adaptation options identified for planned areas and infrastructure?	
	i. Do these provide for total and partial restrictions on land use and development in hazard prone areas?	Yes/No
	ii. Do these include the provision for a public land buffer between sea and rivers, and land?	Yes/No
	iii. Do these include the requirement to establish riparian setbacks with width based on scientific assessments and projections?	Yes/No
	iv. Do these include the requirement to establish coastal setbacks with widths based on scientific assessments and projections?	Yes/No
	v. Do these include the requirement to develop integrated coastal zone management plans that integrate climate change adaptation considerations?	Yes/No
	vi. Do these include the legal requirement to plan the location of essential infrastructure out of flood prone, high-risk areas?	Yes/No
	vii. Do these include the legal requirement to plan sewerage systems, storm drains, and wastewater treatment plants based on predicted rainfall, flooding (sea/river) and densification with a time horizon of at least 20 years?	Yes/No
	viii. Do these include the legal requirement to consider nature-based stormwater management to manage increasing volumes of stormwater in already built-up and expansion areas?	Yes/No
	ix. Do these include provisions that allow the land information system to integrate vulnerabilities and exposure of land parcels to climate hazards?	Yes/No
x. Do these include the legal requirement to plan for evacuation routes and identify locations for low-risk safety areas in case of extreme weather events?	Yes/No	
Adaptation of slums and other vulnerable settlements	3.4 Does your country have provisions of law or regulations to support the adaptation of slums and other vulnerable settlements to the effects of climate change?	
	i. Do these include urban planning and land management tools for urban expansion, infill and redevelopment to change the shape and configuration of plots?	Yes/No
	ii. Do these include differentiated and flexible planning and infrastructure standards for slums and other vulnerable settlements?	Yes/No
	iii. Do these include mechanisms to ensure the participation of all owners and residents of slums and other vulnerable settlements in the process of upgrading with special consideration to women, youth, disabled people, and elderly people?	Yes/No
	iv. Do these include the requirement to conduct community-led surveys, maps and household enumerations to facilitate the adaptation of slums and other vulnerable settlements?	Yes/No
	v. Do these include provisions that ensure the accessibility of water, sanitation and electricity services based on the provision of customary and non-documentary forms in addition to formal tenure rights documents?	Yes/No
	vi. Do these include the legal requirement to maintain the affordability of the upgraded settlement for the pre-existing community and prevent its economic displacement?	Yes/No

Planned relocations from areas at risk of climate change	3.5 Does your country have provisions of law or regulations that support the relocation of populations from areas at risk of the effects of climate change to ensure their safety and health after all reasonable on-site alternatives and solutions have first been explored?	
	i. Do these include the legal requirement to identify and, if necessary, set aside land for relocation in case of extreme weather events?	Yes/No
	ii. Do these include the requirement that the resettlement land need to be safe from current and future climate hazards?	Yes/No
	ii. Do these include a process for planned relocations with inclusive consultation and engagement with the affected resettled and host communities?	Yes/No
Security of tenure	3.6 Does your country have provisions of law or regulations that ensure the security of tenure of people living in slums and other settlements vulnerable to the effect of climate change or whose tenure security might be affected by planned relocations?	
	i. Do these include the legal recognition of a variety of tenure forms including customary rights, informal tenure rights and occupation?	Yes/No
	ii. Do these include the process to regularize informal land and property rights?	Yes/No
	iii. Do these include provisions that allow a variety of tenure forms, including customary rights, informal tenure rights and occupation, to be recorded in the official land information system?	Yes/No
	iv. Do these include provisions of law or regulations on how evictions and relocations should be conducted?	Yes/No
	v. Do these include provisions for land acquisition that consider and compensate loss of formal rights, informal rights and interests and livelihoods for slum dwellers and resettled and host communities?	Yes/No
	vi. Do laws or regulations provide access to formal grievance, review, dispute resolution and redress mechanisms for land and property disputes for people whose tenure security might be affected by the adaptation of slums, vulnerable settlements and planned relocations?	Yes/No
	vii. Do these include alternative dispute-resolution mechanisms for land and property disputes such as customary institutions, negotiation, mediation and arbitration?	Yes/No
Development approval and adaptation	3.7 Does your country have provisions of law or regulations to ensure that planning and design standards for adaptation to climate risks and vulnerabilities are implemented, monitored and enforced through the development approval process?	
	i. Do these include provisions that link the development approval process to legally approved urban plans, zoning regulations and evidence from climate risk and vulnerability assessments?	Yes/No
	ii. Do these include provisions that allow governments to charge developers, either in cash or in kind, through conditions to be attached to the approval of planning applications for infrastructure costs associated with their developments?	Yes/No
	iii. Do these include mechanisms to monitor compliance with the approved development and its conditions?	Yes/No
	iv. Do these include mechanisms for enforcement in the event developments are not compliant with the submitted application and its conditions?	Yes/No



4. URBAN PLANNING AND DESIGN FOR MITIGATION

Urban areas account for between 60 and 80 per cent of energy consumption and generate as much as 70 per cent of human-induced GHGs.¹²⁵ As more than half of the world's population is already living in cities and the rate of urbanization is projected to increase rapidly over the next 30 years, urban areas are increasingly at the centre of the fight against climate change. International development agendas and legal instruments have appreciated the role of cities in climate change mitigation. The role of cities was recognized by Paris Agreement which identified them as important stakeholders, capable of mobilizing strong and ambitious climate action.¹²⁶ The SDGs, particularly SDG 11, calls for inclusive, safe, resilient and sustainable cities and among its targets, and there are several that are directly related to mitigation such as sustainable transport systems, green buildings and the reduction of the environmental impact of cities. SDG 13 on climate action also includes a target on the integration of "climate change measures into national policies, strategies and planning", the latter of which arguably includes urban planning.¹²⁷ The SDGs commitments on climate change mitigation are complemented by the NUA, which aims to promote international, national, subnational and local climate action, and to support the efforts of the inhabitants of cities and human settlements and all local stakeholders as important implementers of such action.

It includes a commitment to reduce GHG emissions from all relevant sectors in line with the goal of the Paris Agreement to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels (para 79).

The NUA also mentions the need for developing "sustainable, renewable and affordable energy, energy-efficient buildings and construction modes; and to promoting energy conservation and efficiency, which are essential to enable the reduction of greenhouse gas and black carbon emissions" (para 75).

Notably, the NUA recognizes the link between climate change and urban planning by expressing the commitment to integrate climate change mitigation into urban and territorial development and planning processes, including greenhouse gas emissions, climate-effective design of spaces, buildings and constructions, services and infrastructure, and nature-based solutions (para 101). Accordingly, this chapter is focused on the urban planning and land-use aspects of climate change mitigation. In particular, it addresses the need for urban plans to consider GHG emissions; the role of climate-friendly urban forms; the importance of green spaces for environmental and climate services; and energy saving in buildings. These elements are backed by a sub-section on monitoring and enforcement.

125 See <https://www.un.org/sustainabledevelopment/cities/#:~:text=Goal%2011%3A%20Make%20cities%20inclusive%2C%20safe%2C%20resilient%20and%20sustainable&text=The%20world%20is%20becoming%20increasingly,60%20per%20cent%20by%202030.>

126 Preamble to decision 1/CP.21.

127 Target 13.2.

4.1. URBAN PLANS AND GREENHOUSE GAS EMISSIONS

The main objective of urban planning is to balance demands for development with the need to protect the natural and cultural environment, whilst simultaneously seeking to achieve certain social and economic objectives. These factors make urban planning a useful tool in reducing GHGs emissions since urban plans have the potential to steer urban development towards low carbon urban development. The way cities and human settlements are planned, designed, governed and managed has an impact on their GHG emissions.

Urban law has an important role to play in helping cities to reduce such emissions: it defines urban forms, where land, infrastructure and basic services can be built; lays out rules for planning and decision making; and sets the context within which urban authorities, local governments and communities are expected to fulfil their mandate and react to emerging challenges. This part seeks to encourage relevant stakeholders to integrate mitigation considerations into their urban planning processes by ensuring that urban plans have mitigation in mind as well as putting emphasis on assessing GHG emissions associated with implementation of approved/final plans.

4.1.1. EMISSIONS FROM EXISTING URBAN FORM

To ensure that deliberate effort is made to promote climate friendly urban development, it is important to first appreciate the baseline. That is, before a city embarks on developing new urban plans, it is crucial that they are adequately apprised of the current state of affairs. Such an understanding would then enable a more informed and strategic decision-making process that is intended to reduce rather than increase GHGs concentrations in the atmosphere. As such, the emphasis here is assessing emissions from the existing urban form, i.e., the “patterns and spatial arrangements of land use, transportation systems and urban design elements, including the physical urban extent, layout of streets and buildings, as well as the internal configuration of settlements”¹²⁸ to identify the starting point of the planning process.

These include emissions from both public and private transport, heating and cooling of buildings, and construction and operation of infrastructure. The *Norway Regulations on Impact Assessments 2017* offer a clearer a mechanism through which emissions from the existing urban form can be determined by requiring an impact assessment to be done on urban plans, including a description of the current environmental status and an overview of how the environment is assumed to evolve if the plan or initiative is not implemented (Section 20). The Vietnam *Urban Planning Law 2009* contains a requirement for forecasts about potential environmental impacts of urban plans which provide a mechanism through which a baseline can be determined. Such a baseline may contain information on emissions from the existing urban form (Article 39).

128 IPCC Human Settlements (2014). Infrastructure and Spatial Planning. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

4.1.2. EXISTING CARBON SINKS

In addition to assessing existing urban form, it is also useful to appreciate the extent of existing carbon sinks, such as forests and water bodies. The mechanisms provided by legal frameworks for the assessment of emissions from existing urban forms can also be used to assess existing carbon sinks. The requirement for an impact assessment to be done on plans, including a description of the current environmental status and an overview of how the environment is assumed to evolve if the plan or initiative is not

implemented under the *Norway Regulations on Impact Assessments 2017*, also covers carbon sinks. Similarly, the Iceland *Planning and Building Act 1997* provides that development plans should contain descriptions of the natural environment and all local conditions in the planning area at the beginning of the planning period (Article 9). The “natural environment” in the Act includes important carbon sinks, such as water bodies, forests and other forms of vegetation.

4.1.3. PLANNING SCENARIOS AND EMISSION LEVELS

With the objective of reducing rather than increasing GHG emissions, the focus should ideally be on going for the most climate-friendly planning scenario. Such a selection can only be possible if different planning scenarios have been considered and their associated GHGs emission levels assessed. In Norway, the planning process is preceded by preparing a description of the proposal. The *Regulations on Impact Assessments 2017* stipulate that the description of the plan or initiative should identify

and describe the factors that may be affected by the plan and assess significant impact on the environment and society, including greenhouse gas emissions (Section 19). Furthermore, it ought to specify the initiative's operational phase, the initiative's energy requirements, energy consumption, energy solutions, transport requirements and an estimation of the type and volume of emissions that will be produced in the construction and operation phase (Section 21).

4.1.4. PLANNING SCENARIOS AND CARBON SINKS

In line with the previous point, planning scenarios need to be accompanied by associated impacts on carbon sinks – so that the least destructive option or the one that enhances the quality and quantity of sinks is selected. The Iceland *Planning and Building Act 1997* requires development plans to account for the impacts of the plan on the environment, natural resources and the community, including, among others, a comparison of the possible alternatives (Article 9). The Norway *Regulations on Impact Assessments 2017*, highlighted above, also

stipulate that the plans or initiative description should include the nature and number of natural resources that will be used. It states that the impact assessment needs to explain the options for design, technology, location, scope and scale the plan proposer has considered, and a study of the relevant and realistic alternatives. The regulations then provide that the choice must be based on the different options and comparisons of the impact these have on the environment and society (Section 19).

4.1.5. URBAN PLAN AND CLIMATE CHANGE STRATEGIES AND TARGETS

In addition to reflecting to the most climate friendly scenarios, it is advisable that urban plans result in “win-win” outcomes, i.e., they should not only steer urban development towards less GHGs and energy use but also have a significant contribution to local, sub-regional and national governments’ climate change strategies, targets and measures. A study undertaken by UN-Habitat in 2017 showed that the majority of NDCs, 113 out of 164, show strong or moderate urban content. While many of these are adaptation related, there are also commitments to reduce emissions from buildings, electricity generation, transport and waste.¹²⁹

For countries to achieve these objectives and meet their mitigation commitments under the Paris Agreement, they need to anchor them in supportive urban plans. In this sense, the urban plans will be promoting both local climate action as well as compliance with international obligations. Norway’s *Regulations on Impact Assessments 2017* provides that impact assessments of plans must identify and describe the factors that may be affected and assess significant impact of the plan on the environment and society, including nationally and internationally agreed environmental targets (Section 21).

4.1.6. URBAN PLAN EMISSION REDUCTION TARGETS

This part is concerned with finding out whether urban plans have targets to reduce GHGs emissions. It also requires plans to have measurable and verifiable benchmarks against which progress can be assessed. Such an exercise would reveal the efficacy of agreed actions and provide the basis for additions, adjustments or cessation of certain actions based on their effects.

The Canada (*British Columbia*) *Local Government (Green Communities) Statutes Amendment Act 2008* added the requirement for an official community plan to include targets for the reduction of greenhouse gas emissions in the area covered by the plan coupled with the policies and actions that the local government proposes to achieve those targets.

4.1.7. URBAN PLAN GREENHOUSE GAS EMISSIONS IMPACT ASSESSMENT

This part concerns assessing the implementation of the urban plan itself – as opposed to the different planning scenarios – to determine its impact on GHGs emissions and carbon sinks. This information may be obtained through environmental impact assessments or strategic impact assessments. In Vietnam, the *Urban Planning Law 2009* provides for strategic impact assessments of several types of urban-related plans including a general

plan, zoning plan, detailed plan and specialized technical infrastructure plan. It is noteworthy that among the matters that should be covered in the assessment are quality of water, air and ecosystem: exploitation and utilization of natural resources; and climate change as well as forecasts about environmental development and comprehensive solutions aimed at preventing, reducing and remedying environmental impacts (Article 39).

129 UN-Habitat (2020). Enhancing Nationally Determined Contributions Through Urban Climate Action.

4.2. URBAN FORM AND REDUCTION OF GREENHOUSE GAS EMISSIONS

Urban form is not only crucial in influencing transport activity and mobility choices but should also be a priority area for enhancing climate change mitigation. Transport accounts for one of the main sources of GHGs in urban areas. The sector is estimated to produce around 23 per cent of global energy-related CO₂ emissions, a figure which is projected to grow to 33 per cent by 2050 under a business-as-usual scenario.¹³⁰ Approximately 75 per cent stems from private vehicle and truck usage. Although transport emissions per capita in developing countries are relatively low on an absolute basis compared to OECD countries, around 90 per cent of the increase in global transport-related CO₂ emissions is expected to occur in developing countries, mostly from private vehicles and freight.¹³¹ Climate change mitigation in the urban context needs to involve the promotion of urban forms that support a reduction in GHGs. In particular, such forms should be geared towards reducing vehicular trips and instead encouraging the use of public transport and non-motorized means, such as walking and cycling.

In turn, this strategy would require consideration for issues such as density, land-use mix, connectivity and accessibility.

Density can be measured in different ways; it could be the number of people in a given area (population density);¹³² the total floor area of buildings divided by the land area of the plot on which the buildings are built (floor area ratio.) or the number of dwelling units in any given area (residential density). Land-use mix refers to the diversity and integration of land uses (e.g., residential, park, commercial) at a given scale. Land-use mix can be measured by considering the ratio of jobs to residents; the variety and mixture of amenities and activities; and the relative proportion of retail and housing.

Connectivity refers to street density and design, and common measures include intersection density or proportion, block size, intersections per road kilometre, minimum percentage of land for streets, street density, etc. Accessibility can be viewed as a combination of proximity and travel time and is closely related to land-use mix. Common measures of accessibility include population centrality, job accessibility by auto or transit, distance to the city centre or central business district (CBD) and retail accessibility.¹³³

130 IPCC (2014b). Climate Change 2014: Mitigation of Climate Change – Transport. Working Group III: Mitigation of Climate Change. Potsdam, Intergovernmental Panel on Climate Change.

131 UNCSO (2012). "Sustainable, low carbon transport in emerging and developing economies: Rio 2012 Issues Briefs, Rio+20 United Nations Conference on Sustainable Development 13.

132 UN-Habitat recommends a density of at least 15,000 people per km², that is 150 people/ha or 61 people/acre. However, this has to be accompanied by adequate space for streets and an efficient street network, mixed land use and a social mix in terms of housing options. This recognizes that population density without accessibility can lead to traffic congestion, lower economic productivity, higher crime rates and other social problems. See UN-Habitat's Five Principles of Sustainable Neighbourhood Planning. Available at: <https://unhabitat.org/sites/default/files/download-manager-files/A%20New%20Strategy%20of%20Sustainable%20Neighbourhood%20Planning%20Five%20principles.pdf>

133 IPCC (2014). "Human Settlements, Infrastructure and Spatial Planning". In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

It is noteworthy that climate-friendly urban forms not only reduce GHGs but they have also been linked to benefits such as improved public health, enhanced employment opportunities, greater economic productivity and reduced local pollution.¹³⁴ The role of urban form in climate change mitigation is often underscored by comparing emissions from European cities with those from North America. European urban areas tend to be more compact, with lower car ownership and car usage rates and generally smaller, more fuel-efficient cars, reducing emissions from private transport. They tend to have more effective public transport networks, which are deemed socially acceptable to a broader range of individuals.

Urban areas in Europe also tend to have relatively higher levels of densification and lower levels of sprawl in comparison to North American cities.¹³⁵ For instance, Stockholm and Pittsburgh have roughly the same population, but Pittsburgh occupies five times as much land area. This means that people need to travel farther, at greater personal and environmental expense, excluding many of them from economic and social opportunities. Meanwhile, Stockholm is widely recognized as having a very high quality of life and a thriving, inclusive economy thanks in part to its compact, connected form.¹³⁶

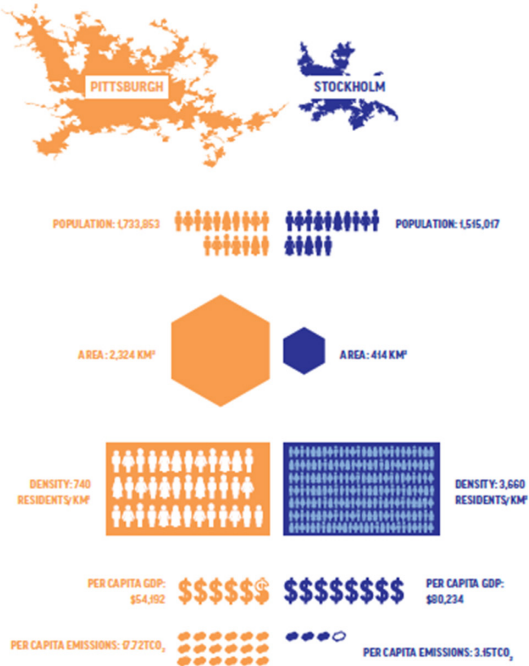


FIGURE 1. Urban extent of Pittsburgh and Stockholm, shown at the same scale (Source: Coalition for Urban Transitions)¹³⁷

134 Andy Gouldson, Andrew Sudmant, Haneen Khreis and Effie Papargyropoulou (2018). The Economic and Social Benefits of Low-Carbon Cities: A Systematic Review of the Evidence. Coalition for Urban Transitions.

135 UN-Habitat, Cities and Climate Change (2011).

136 Coalition for Urban Transitions, Climate Emergency-Urban Opportunity (2019).

137 Ibid.

4.2.1. CONNECTIVITY AND MINIMUM STANDARDS FOR STREETS

An integral strategy for reducing GHGs in urban areas is replacing vehicular use with more climate- friendly mobility options such as walking and cycling. For such a strategy to work, streets must be conducive to these modes of transport as they play a significant role in determining urban form. Indeed, the street is not only a channel of movement but also a public space where individuals and communities meet for social and commercial encounters and exchange, and political space expressions as well as acting as a symbolic and ceremonial space in the city.¹³⁸ The NUA captures the value of public spaces such as streets by defining them as "multifunctional areas for social interaction and inclusion, human health and well-being, economic exchange, and cultural expression and dialogue among a wide diversity of people and cultures" (Para 37). Streets need to promote connectivity and be adequate. Where street connectivity is high - characterized by finer grain systems with smaller blocks that allow frequent changes in direction - there is typically a positive correlation with walking and thereby lower GHG emissions. Two main reasons for this are that distances tend to be shorter and the system of small blocks promotes convenience and walking.¹³⁹ In terms of adequacy, an indicative standard is 30 per cent of total land area.¹⁴⁰

Example of cities which have met this threshold in their core areas are Manhattan (New York) with 36 per cent, Barcelona with 33 per cent, Hong Kong also with 33 per cent and Paris with 30 per cent.¹⁴¹ One of the main objectives of the *Urban Design Guidelines* for the Australian State of Victoria is to provide a permeable and functional urban structure of blocks and streets. It provides for an interconnected street layout with regular block sizes, ranging from 120 m to 240 m long, and 60 m to 120 m wide, while noting that such dimensions provide for good pedestrian access. It also calls for a legible urban structure of blocks and streets, with a preference for straight streets. This requirement is meant to encourage walkability as the guidelines note that "areas with straight streets and clear sightlines are easier to navigate and safer for pedestrians". The guidelines also require the layout of streets and blocks to provide reasonable walking distances from dwellings to an activity centre and public transport services. It is recommended that the activity centre be located where the main streets and public transport routes converge, and states that such centres should be within 400 m (or five minute) walking distance of residential areas.

Furthermore, blocks on the perimeter of the activity centre should be shaped and oriented to support direct access to the activity centre core from the surrounding neighbourhood.

138 UN-Habitat (2013). Streets as Public Spaces and Drivers of Urban Prosperity.

139 IPCC, Human Settlements (2014). Infrastructure and Spatial Planning. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

140 UN-Habitat's Five Principles of Sustainable Neighbourhood Planning. Available at <https://unhabitat.org/sites/default/files/download-manager-files/A%20New%20Strategy%20of%20Sustainable%20Neighbourhood%20Planning%20Five%20principles.pdf>

141 UN-Habitat (2013). Streets as Public Spaces and Drivers of Urban Prosperity.

4.2.2. CONNECTIVITY AND STREET DESIGN STANDARDS

Streets need to be "walkable", i.e., traversable, compact, physically enticing and safe. Walkability connotes "environments that support walking, jogging, running, biking, in-line skating and other non-motorized forms of travel".¹⁴² The quality of "walkability" factors in distance (a radius that can be comfortably accessed by walking or cycling), design (attractiveness, convenience, safety and security of the place, including roads and sidewalks), and land-use mix (wide range of land uses within the radius, including retail, recreational, educational and residential, so that residents are provided with many destinations and gathering spaces). Walkable cities have several benefits, such as lower emissions, through sustainable transport options, better health outcomes by inducing physical activities and a more vibrant/liveable environment. Planning frameworks should thus require street design standards that include accessible pavements, crosswalks, street lighting, on-street parking, bicycle lanes, accessibility ramps, landscaping, etc.

Switzerland's *Spatial Planning Act 1979* requires settlements to contain numerous open spaces and trees in addition to calling for the creation and maintenance of cycle paths and foot paths (Article 3.3). The *UK Manual for Streets (2007)* offers a more detailed example, as it contains various provisions on street standards to facilitate walkability. Examples include: pedestrian routes need to be direct and match desire lines as closely as possible; pedestrian networks need to connect with one another and where these networks are separated by heavily-trafficked roads, appropriate surface-level crossings should be provided where practicable;

all crossings should be provided with tactile paving; surfaces used by pedestrians need to be smooth and free from trip hazards; and seating on key pedestrian routes should be considered every 100 m to provide rest points and to encourage street activity. To encourage cycling, the manual also states that: cycle access should always be considered on links between street networks which are not available to motor traffic, in that if an existing street is closed off, it should generally remain open to pedestrians and cyclists; routes should avoid the need for cyclists to dismount; junctions should be designed to promote slow motor-vehicle speeds, which may include short corner radii as well as vertical deflections; and that if cycle lanes are installed, measures should be taken to prevent them from being blocked by parked vehicles.¹⁴³

In Colombia, the *Decree for the Housing, City and Territory Sector* (Decree 1077 of 2015) recognizes bike paths as an integral part of the urban fabric. This law has been supplemented by Law 1811 of 2016 (*Law of Bicycle Usage*), which contains extensive provisions aimed at promoting cycling and walkability. Article 4 calls for the establishment of adequate parking formations for bicycles in order to allow cyclists to seamlessly park and connect with different forms of transit, and they will also prioritize pedestrian use within the systems and the use of bicycles, ensuring the safety and comfort of users. The law also stipulates that if there are less than 120 parking spots for cars, there needs to be at least 12 spaces for bicycles within the same parking lot. These spots need to be created and available within two years of the creation of the facility (Article 6).

142 Greenberg M.R. and Renne J. (2005). "Where does walkability matter the most? An environmental justice interpretation of New Jersey data". *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 82 (1): pp. 90-100.

143 Department for Transport (2007). *Manual for Streets*. Thomas Telford Publishing. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf

Regarding pavements, the *Housing, City and Territory Sector Decree* specifies that, in order to promote pedestrian-friendliness and walkability, pavements should be levelled, continuous and free of obstacles. Hard, non-slip surfaces are to be used as paving (Article 1, 1.1). The decree also stipulates the requirements needed to ensure a continuous pavement surface in the event of a change in level roadway crossing,

such as tunnels, stepped baths and bridges (Article 1, 1.2). If pavements are included in a motorized vehicle lane, then it is required that different textures are to be used to protect pedestrians and delineate the pavement from traffic (Article 1, 1.6). The decree goes into great detail on pavement standards as well as engineering standards (Section 1, 1.1-18; Article 2.2.3.5.2.2.2).

4.2.3. CONNECTIVITY AND PLOT DESIGN RULES FOR A WALKABLE STREETScape

Related to street design standards are plot design rules. Walkable neighbourhoods need to cater to the needs of pedestrians and cyclists and respond to the scale of people rather than vehicles. Examples of plot design rules to promote walkability are: reduced building setbacks towards the streets, standards for private fencing, plot coverage rules that favour buildings' interaction with streets, restrictions of parking towards the streets, etc. Some cities have established supportive rules such as the Houston *Walkable Places Ordinance*, which shifts parking to the back of buildings and brings buildings closer to the street instead of having parking in front, like a suburban-style development. This measure is expected to promote walkability as it enables pedestrians to enter buildings directly from the pavement.¹⁴⁴

The City of Somerville (Massachusetts) also reformed its zoning plan through the *Somerville by Design Code*, which eliminates mandatory parking requirements for much of the city and sets an upper limit on how much parking can be built in the most transit-accessible neighbourhoods.¹⁴⁵ The UK *Manual for Streets* (2007) also offers a good example. It provides that "the space between the front of the building and the carriageway, footway or other public space needs to be carefully managed as it marks the transition from the public to the private realm. Continuous building lines are preferred as they provide definition to, and enclosure of, the public realm".¹⁴⁶

4.2.4. ACCESSIBILITY AND MIXED LAND USE

Lower GHGs in urban areas may be achieved by enhancing accessibility and promoting mixed land uses. High accessibility of jobs, housing and recreation minimizes the need for vehicular transport, reduces travel times and encourages

the use of alternative (and climate-friendly) modes such as walking and cycling. Related to accessibility is land-use mix, which refers to the diversity and integration of land uses (e.g. residential, park, commercial) at a given scale.

144 See <https://www.houstonpublicmedia.org/articles/news/transportation/2020/08/05/379241/city-council-sets-new-rules-aimed-at-creating-walkable-transit-friendly-streets/>

145 See <https://www.somervillebydesign.com/>

146 Department for Transport (2007). *Manual for Streets*. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/341513/pdfmanforstreets.pdf

In general, when there is land-use specialization and separation of uses, the distance between origin and destination will be longer, e.g., as people have to move from residential areas to commercial areas for work or shopping. At the city scale, a high degree of land-use mix can thus result in significant reductions in emissions by increasing the proximity of housing to offices, business districts and shopping centres. These qualities are embodied in concept of the “20-minute neighbourhood” popularized in Portland, Oregon, and now adopted by many cities and reformulated into the “15-minute city/neighbourhood”. The concept represents a vision for city life in which residents live in a sustainable and liveable neighbourhood with the ability to find or access most of their needs by walking or cycling a short distance - within 15 minutes of where they live. As key services are in close proximity and readily accessible, urban residents live locally and can reduce their dependency on private vehicles, which reduces traffic congestion and carbon emissions in addition to promoting local interaction and vibrancy, thus improving residents’ quality of life.¹⁴⁷ With the advent of the Covid-19 pandemic and its associated movement restrictions, this concept has received renewed focus as people

require convenient access in the neighbourhood to essential goods and services (such as groceries, healthcare and pharmacies), together with amenities (such as parks or community gathering space), within a short walking distance. For instance, the Mayor of Paris made the 15-minute city the centrepiece of her re-election campaign in 2020 as defined by the four inter-related principles of proximity, diversity, density and ubiquity. Other cities, including Madrid, Milan, Ottawa and Seattle, have declared plans to emulate this approach. Melbourne has adopted a long-term strategic plan for 20-minute neighbourhoods and C40 Cities has gone as far as promoting the 15-minute city idea as a blueprint for post-Covid-19 recovery.¹⁴⁸ An example of a city that has emphasized accessibility and land use in its planning legislation is New York, where the **State Smart Growth Public Infrastructure Policy Act 2010** makes it clear that approval of plans must be done in accordance with the “state smart growth public infrastructure criteria”. These include fostering mixed land uses and compact development, downtown revitalization and the diversity and affordability of housing in proximity to places of employment, recreation and commercial development (Section 6-0107).

4.2.5. URBAN DENSITY

Urban density has an effect on GHG emissions as a result of two factors. First, separated and low densities increase the average travel distances for both work and shopping trips, which translates into higher emissions.

Second, low densities make it difficult to switch over to less energy intensive and alternative modes of transport such as public transport, walking and cycling because the transit demand is both too dispersed and too low.¹⁴⁹

147 Iris Tam, Osler (2021). “Why 15-minute neighbourhoods may be more popular now than ever”. (12 January 2021). Available at <https://www.osler.com/en/resources/regulations/2021/why-15-minute-neighbourhoods-may-be-more-popular-now-than-ever>

148 Peter Yeung (2021). “How ‘15-minute cities’ will change the way we socialize”. BBC Worklife. 4 January, 2021. Available at <https://www.bbc.com/worklife/article/20201214-how-15-minute-cities-will-change-the-way-we-socialise>

149 IPCC, Human Settlements (2014). Infrastructure and Spatial Planning. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

As such, climate-friendly legal frameworks should promote optimal density that considers land availability, level of existing and planned infrastructure, income levels, land values, availability of building materials, cultural and climatic factors, for lower GHGs. Measures to promote density include allowing higher densities in land-use plans, coordinated infrastructure and land-use planning, allowing small plots, density bonus, etc.

4.2.6. OPTIMAL DENSITIES

Transport infrastructure is a powerful instrument in shaping where urban development occurs and in what forms. The lack of integration between density, land use and transport has contributed to urban sprawl, increased vehicular use and, consequently, more congestion, greater air pollution and higher emissions.¹⁵⁰ This part thus seeks to assess the extent to which urban areas leverage the link between densities and infrastructure planning to promote “transit-oriented development” (TOD). TOD holds several advantages including improved mobility and efficiency of the transport system, equitable development, more conservation of land resources and open spaces and a significant reduction in vehicle trips, vehicle miles travelled and travel times, as well as greater pedestrian mobility and better air quality.¹⁵¹ Indeed, research shows a clear linkage between density and transit use.

Tanzania's *Urban Planning Act 2007* requires planning authorities to ensure that the schemes are geared towards vertical growth rather than horizontal growth (Section 7.5.c). It adds that the objective of every detailed planning scheme should be to coordinate all development activities, to control the use and development of land, including intensive use of urban land and, in particular, vertical and compact urban development (Section 16).

Residents of high-density neighbourhoods are not only more likely to use transit, but also higher densities bring more origins and destinations within easy access of transit, especially by walking.¹⁵² An example of a supportive law is Switzerland's *Spatial Planning Act 1979*, which provides that residential and working areas should be suitably located adjacent to each other and mainly planned in locations that are adequately served by public transport (Article 3.3). The city of Curitiba in Brazil has also used legislative means to link urban development to infrastructure. These include *Law No. 4199 of 1972* which designated high density residential and commercial zones along the north-south and northeast-west axes; *Law No. 5,234 of 1975* which limited density in the peripheral residential zone and aided the city to promote residency along structural corridors;

150 See <https://www.c40.org/networks/transit-oriented-development#:~:text=Transit%20oriented%20development%20represents%20a,congestion%20and%20air%20pollution%20while>

151 Daniel Baldwin Hess and Peter A. Lombardi (2004). “Policy Support for and Barriers to Transit-Oriented Development in the Inner City: Literature Review.” *Transportation Research Record: Journal of the Transportation Research Board*. Vol 1887, Issue 1.

152 Centre for Transit Oriented Development (2013). *Implementing Equitable Transit Oriented Communities*; Appendix A: Literature Review of Review into Transit Supportive Densities. For Puget Sound Regional Council. Available at: http://www.psrc.org/assets/9179/GTC_Implementation_Report_SE011116withblankpage.pdf.

and *Decree 380 of 1993* which incentivized TOD through density bonuses and transfer development rights by enabling building owners in areas with lower densities to sell or transfer development rights to those in high-density zones.¹⁵³ The *Urban Design Guidelines* for the Australian State of Victoria encourage development that combines walkability with access to public transport.

It recommends the creation of a street and block layout where 95 per cent of dwellings are located no more than: 400 m street walking distance (five-minute walk) from the nearest existing or proposed bus stop, or 600 m street walking distance (seven-minute walk), from the nearest existing or proposed tram stop or 800 m street walking distance (ten-minute walk) from the nearest existing or proposed railway station.

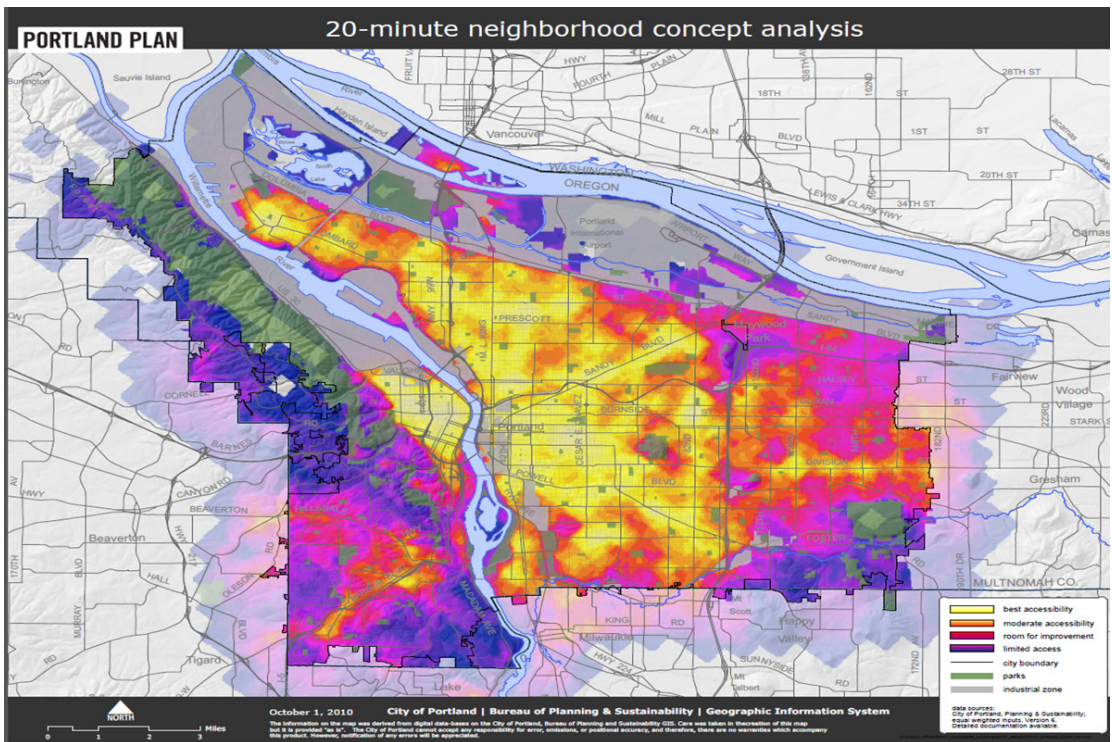


FIGURE 2. A Mapping Analysis of Portland's 20-minute Neighbourhood
(Source: City of Portland)¹⁵⁴

153 ICLEI (March, 2016). "Curitiba, Brazil: A model for Transit Oriented Development" ICLEI Case Studies.

154 Find out more at <https://www.portlandonline.com/portlandplan/index.cfm?a=288098&c=52256>

4.3. GREEN SPACES FOR ENVIRONMENTAL AND CLIMATE SERVICES

Green urban areas include parks, public greenspaces, green corridors, street trees, urban forests, green roofs and private domestic gardens. Green spaces are important for mitigation of the urban heat island effect as well decreasing the net amount of CO₂ in the atmosphere by acting as carbon sinks.¹⁵⁵ These areas can play a major role in promoting soil carbon sequestration, organic waste recycling through composting and encouraging wastewater reuse. Green spaces dedicated for urban and peri-urban agriculture could also contribute to energy savings as locally grown food reduces the need for transport and refrigeration requirements.¹⁵⁶

Moreover, green spaces also offer other benefits, such as increased property values, reduced air pollution, increased recreational space, provision of shade and cooling, rainwater interception and infiltration, increased biodiversity support and enhancement of well-being.¹⁵⁷

For this part, the main elements to be highlighted are how much space is dedicated to green areas; how are the green spaces distributed; and how green and blue (water bodies) resources are integrated.

4.3.1. STANDARDS FOR GREEN PUBLIC SPACES

Planning and land-use legal frameworks may promote the creation of green spaces in urban areas by creating a long-term vision of a green city within the local authority; integrating urban green space infrastructure needs in urban plans; considering green spaces within infrastructural projects (housing, transport, business parks, community and health facilities) and urban rehabilitation approaches; and considering regional planning frameworks such as green corridors and networks.¹⁵⁸

One of the recommended ways of ensuring this is by establishing minimum quantitative standards, such as prescribed level of provision of open space related to the level of population – typically per 1,000 population; specified percentage of land to be allocated for open green space (e.g., 15 per cent from the total development area); or distances which residents should have to travel to gain access (e.g. quarter of a mile walking distance from users' neighbourhood; which may also be expressed in time travelled e.g., within five minutes of walking).¹⁵⁹

155 IPCC, Human Settlements, Infrastructure and Spatial Planning (2014).. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

156 Federico M. Butera (2018). Energy and Resource Efficient Urban Neighbourhood Design Principles for Tropical Countries: A Practitioner's Guidebook. UN-Habitat.

157 IPCC, Human Settlements (2014). Infrastructure and Spatial Planning. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the IPCC Fifth Assessment Report.

158 WHO (2017). Urban green spaces: a brief for action (2017).

159 M.R. Maryanti, H. Khadijah, A. Muhammad Uzair and M.A.R. Megat Mohd Ghazali (2016). Sustainable Development and Planning "The urban green space provision using the standards approach: issues and challenges of its implementation in Malaysia" (WIT Press 2016).

For instance, the WHO recommends a minimum of 9 m² of urban green space for each person¹⁶⁰ and at least 0.5–1 hectare within 300 metres' linear distance (around five minutes' walk) of their homes.¹⁶¹ The Indonesia *Spatial Management Law 2007* offers a good example, requiring the proportion of open green space in an urban region to be at least 30 per cent of the urban area (Article 29). Singapore's *Landscaping for Urban Spaces and High-Rises (Lush) Policy* requires new buildings to include areas of greenery equivalent to the size of the development site. These can be at ground level or at height, and often include luxuriantly planted balconies or shaded sky gardens.¹⁶² The Uganda *Physical Planning Act 2010* gives local physical planning committees the power to ensure the preservation of all land planned for open spaces,

parks, urban forests and green belts, environmental areas, social and physical infrastructure, and other public facilities (Section 32.e). The St Lucia *Physical Planning Act 2001* provides that matters to be dealt with in physical plans should include allocation of lands as open spaces; allocation of lands for communal parks; for game and bird sanctuaries; for the protection of marine life; for national parks and environmental protected areas; and preservation or protection of forests, woods, trees, shrubs, plants and flowers (Schedule 2). Colombia's *National Sustainable Building Policy* (CONPES 3919 of 2018) specifies Colombia's goal of having 10 m² of green space per inhabitant with a broader goal of increasing it to 15 m². Currently, Colombia has an average of 2.6 m² green space per resident.

4.3.2. DISTRIBUTION OF GREEN SPACES

In addition to green spaces being an essential component of climate change mitigation, their distribution across the city holds added advantages. These are highlighted by NUA, which notes that well-connected and well-distributed networks of green spaces improve physical and mental health, urban liveability and enhance resilience to environmental risks.

Often green spaces are not equitably distributed and low-income neighbourhoods tend to have fewer trees, leading to more vulnerability to heat waves and landslides. Indonesia's *Spatial Management Law 2007* described above also provides that the open green space must be distributed according to population spread and the service hierarchy with respect to structure plan and space pattern (Article 30).

4.3.3. GREEN AND BLUE INFRASTRUCTURE

Numerous ecological and social benefits are realized when green spaces and blue infrastructure (lakes, rivers, canals, ponds, wetlands, floodplains, water treatment facilities etc.) are integrated.

Such infrastructure is essential for climate change mitigation as they act as carbon sinks, in addition to providing valuable ecosystem services such as improving air and water quality, enhancing flood and temperature regulation and reducing noise.

160 WHO (2010). Environment and Health: From Evidence to Policy Action.

161 WHO (2017). Urban green spaces: a brief for action.

162 See [https://www.ura.gov.sg/Corporate/Guidelines/Circulars/dc14-12-original#:~:text=for%20Strategic%20Areas-Landscaping%20for%20Urban%20Spaces%20and%20High%2DRises%20\(LUSH\)%202.0,Replacement%20Policy%20for%20Strategic%20Areas&text=Under%20the%20landscape%20replacement%20policy,other%20areas%20within%20the%20development.](https://www.ura.gov.sg/Corporate/Guidelines/Circulars/dc14-12-original#:~:text=for%20Strategic%20Areas-Landscaping%20for%20Urban%20Spaces%20and%20High%2DRises%20(LUSH)%202.0,Replacement%20Policy%20for%20Strategic%20Areas&text=Under%20the%20landscape%20replacement%20policy,other%20areas%20within%20the%20development.)

Networks of green and blue infrastructure also allow the complete water cycle to occur within the city; for example green, sustainable, urban drainage solutions such as swales, water gardens and green roofs increase the infiltration and slow the removal of rainfall into the drainage system, reducing the risk of surface water flooding.¹⁶³

Copenhagen exhibits a good case of integrating blue and green infrastructure through the ***Cloudburst Management Plan 2012*** designed to increase the city's blue and green infrastructure and prevent flooding. The green infrastructure, in the form of parks and natural areas, will absorb rainwater for storage and managed seepage, while water-transporting boulevards will funnel excess water away from inundated areas. These actions address not only cloudburst events but also urban heat island issues.¹⁶⁴

¹⁶³ Kathryn Brown and Ana Mijic (July 2019). "Integrating green and blue spaces into our cities: Making it happen", Grantham Institute Briefing Paper No 30.

¹⁶⁴ See https://www.c40.org/case_studies/cities100-copenhagen-green-infrastructure-prevents-flooding

4.4. NEIGHBOURHOOD DESIGN AND ENERGY SAVING IN BUILDINGS

Buildings account for a significant share of urban energy use and GHG emissions: 32 per cent of total global final energy use, 19 per cent of energy-related GHG emissions (including electricity-related), approximately one-third of black carbon emissions and an eighth to a third of F-gases.¹⁶⁵ The IPCC has underscored the importance of considering buildings in climate change mitigation discourse by noting that "existing and future buildings will determine a large proportion of global energy demand".

It observes that while "current trends indicate the potential for massive increases in energy demand and associated emissions", buildings also "offer immediately available, highly cost-effective opportunities to reduce (growth in) energy demand, while contributing to meeting other key sustainable development goals, including poverty alleviation, energy security and improved employment".¹⁶⁶ Accordingly, this part is concerned with how neighbourhood design can be leveraged for buildings with limited emissions and energy use.

4.4.1. URBAN FORM AND ENERGY SAVING IN BUILDINGS

Neighbourhood plans can promote less energy-intensive buildings by taking advantage of natural conditions. Adequate orientation and layout of streets in each local climate and geographical location can minimize trapping of solar radiation and favour wind access (ventilation).¹⁶⁷ One example of a country which has reflected this quality in its legislative framework is Sweden.

According to the *Planning and Building Act 2011*, an undeveloped lot which is to be developed must be arranged in a way that is suitable regarding the townscape or landscape and to the natural and cultural assets there (Cap 8 Section 9.1).

4.4.2. THERMAL PROPERTIES OF URBAN SURFACES

Thermal properties of urban surfaces can influence the energy use and comfort of buildings. For instance, an increase in albedo (the ability of a surface to reflect solar radiation) can significantly reduce the daytime high surface temperature in summer.¹⁶⁸

By reducing the amount of paved surface areas or by choosing adequate colours and permeable and porous paving materials it is possible to influence both the thermal comfort at pedestrian level and the energy consumption of buildings.

165 IPCC (2014). Buildings. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

166 Ibid.

167 UN-Habitat (2018). Energy and Resource Efficient Urban Neighbourhood Design Principles for Tropical Countries: A Practitioner's Guidebook. UN-Habitat.

168 H. Li1, J.T. Harvey, T.J. Holland and M. Kayhanian (2013). "The use of reflective and permeable pavements as a potential practice for heat island mitigation and stormwater management." Environmental Research Letters, Volume 8, Number 1.

Some legal frameworks have already recognized the utility of regulating the thermal properties of urban surfaces. Houston's *Commercial Energy Conservation Code of 2008* requires that air-conditioned government, commercial and multifamily residential buildings that install or replace low-slope roofs have a minimum initial solar reflectance of 0.70 and a minimum thermal emittance of 0.75, but includes exemptions for buildings that have already implemented

other mitigation-supportive measures such as vegetated roofs and solar panels. California also passed the *Cool Pavements Research and Implementation Act 2012*, which calls on the California Environmental Protection Agency and the California Department of Transportation to develop a standard specification for sustainable or cool pavements that can be used to mitigate urban heat islands.

4.4.3. PLOT DESIGN AND ENERGY SAVING IN BUILDINGS

Building orientation is a crucial aspect of reducing the energy consumption of buildings. It refers to the practice of placing a building to take advantage of natural conditions to regulate its indoor temperature and light.¹⁶⁹ The optimal orientation of the buildings depends on the local climate and geographical location, and can be achieved when the building has good ventilation and exposure to sunlight. A plot design that supports optimal building orientation for climate change mitigation would, for instance, position windows by considering the direction of the movement of the sun to ensure entry of light but not intense heat, and would consider prevailing winds to promote cross ventilation. Sweden's *Planning and Building Act 2010* also provides that buildings must be arranged such that the natural conditions are taken advantage of to the greatest possible extent (Cap 8 Section 9.1).

Canada (*British Columbia*) *Local Government (Green Communities) Statutes Amendment Act 2008* provides that when granting a development permit, the local authority may include requirements with respect to landscaping, siting of buildings and other structures and form, and exterior design of buildings and other structures' specific features in the development. It also allows restrictions to be placed on the type and placement of trees and other vegetation in proximity to the buildings and other structures in order to provide for energy, water conservation and reduce greenhouse gas emissions (Section 24). The Uganda *National Physical Planning Standards and Guidelines 2011* under part 2.6 (a) also provides that orientation of residential buildings should be carefully considered in relation to the sun and prevailing winds.

¹⁶⁹ UN-Habitat (2020). Promoting Energy Efficiency in Buildings in East Africa: Technical Note 7- Energy and Resource Efficiency Checklist.

4.5. IMPLEMENTATION OF CLIMATE MITIGATION STRATEGIES THROUGH DEVELOPMENT APPROVAL/CONTROL

Development control is the process through which authorities manage the nature and extent of land development. It is meant to ensure that development occurs in appropriate locations; is consistent with the protection of the environment and natural resources; that buildings are structurally sound; and that structures are equipped with the basic services and facilities necessary to support the purpose for which they are erected. Developers are typically required to seek authorization prior to undertaking activities - including land subdivision, land consolidation, rezoning applications and neighbourhood plans - by applying for permission from the local authority.

Development control is a valuable tool in this context as it ensures that planning and design standards for climate change mitigation are implemented, monitored and enforced through the development approval process. Climate change mitigation in urban development processes It can be used to prevent carbon-intensive developments (by denying permission to such proposals); force developers to include mitigation infrastructure (such as systems to monitor GHGs emissions); and promote the conservation/preservation of carbon sinks such as forests and other forms of vegetation.

4.5.1. DEVELOPMENT APPROVAL AND MITIGATION

The mitigation strategies and priorities discussed above require a mechanism to ensure implementation, monitoring and enforcement. Legal frameworks that establish standards but do not accompany them with a development control process risk being ineffective due to the absence of a compliance mechanism. Sweden's *Planning and Building Act 2010*, which establishes specific requirements related to climate change mitigation - such as providing that buildings must be arranged such that the natural conditions are taken advantage of to the greatest possible extent - ensures this is done by establishing a development approval process. Chapter 9 of the Act mandates developers to acquire a building permit from the local authority before undertaking construction.

Through this mechanism, the approving authority can ascertain that laid out mitigation standards are upheld. Similarly, Switzerland's *Spatial Planning Act 1979* contains several measures aimed at promoting climate change mitigation. These include the requirement that residential and working areas should be suitably located adjacent to each other and mainly planned in locations that are adequately served by public transport. This standard is enforced through a development control mechanism under which developers must acquire a permit prior to development. Under Article 22 of the Act, the basic requirement for a permit is that the buildings and installations conform to the purpose of the land use zone, and that the land is connected to infrastructure and utilities.

4.5.2. DEVELOPERS' CONTRIBUTION FOR MITIGATION INFRASTRUCTURE

New development often leads to a heavier burden on urban authorities with regards to infrastructure and service provision. To avoid overwhelming public authorities, especially in contexts of limited resources, part of this burden may be shifted to the developers at the development approval stage. Legal frameworks may allow authorities to charge developers for infrastructure costs associated with the development, either in monetary or in kind, through conditions attached to the planning permission. Examples of infrastructure costs related to mitigation include construction or maintenance of green areas and installation of energy-saving facilities. The Bahamas' *Planning and Subdivision Act 2010* provides that as a condition of approval of an application for subdivision approval or site plan approval

in the case of land for residential uses, the approving authority should require not less than five per cent of the total land area to be developed for parkland, including a public park, open space and other recreational purposes. Dominica's *Physical Planning Act 2002* allows the imposition of conditions on a grant of development permission for the preservation of trees, vegetation or other natural features of the land where the development is to take place (Section 28.1.a). Mauritius' *Planning and Development Act 2004* allows conditions to be attached to the granting of planning permission, including actions to prevent environmental damage from the development and the preservation of trees and other natural resources (Section 32).

4.5.3. COMPLIANCE MONITORING AND MITIGATION

An effective development control system needs to include mechanisms to monitor compliance with the approved development and its conditions. The Malawi *Physical Planning Act 2016* gives authorized officers the power to enter any land or building to inspect or survey for the purpose of preparing a plan or determining whether any unauthorized development is being or has been undertaken on the land or in the building (Section 95.1). The Bahamas' *Planning and Subdivision Act 2010* also gives

the right of entry to authorized personnel to inspect whether developments are adhering to the conditions on which they were approved (Section 71). The Colombian *National Climate Change Policy's* section 9 provides a framework for measuring and evaluating the success of the goals outlined in the National Climate Change Policy. Information gathered during this process is to be used to influence Colombia's Nationally Determined Contribution report, which must be updated every five years.

4.5.4. COMPLIANCE ENFORCEMENT AND MITIGATION

To ensure that development control achieves its climate change mitigation objectives, it is essential that compliance mechanisms exist. These are necessary in the event that developments are not compliant with the submitted application and its conditions.

Saint Lucia's *Physical Planning Act 2002* provides for service of an "enforcement notice" and a "stop notice" where development is occurring without permission or the developer has not complied with any condition subject to which permission was granted (Section 37-39).

Similarly in Malta, "enforcement notices" may be issued under the *Development Planning Act 2016*, where development is being carried out without permission or is taking place without adherence to accompanying conditions. Authorities also have the right to enter the site

and take steps to enforce the order, including disabling or removing equipment, machinery, tools, belongings, vehicles or other objects that may be on site, and to carry out any works necessary to comply with what is requested in the enforcement notice (Section 97-100).

TABLE 4. Urban Planning and Design for Mitigation

Urban plans and greenhouse gas emissions	4.1 Does your country have provisions of law or regulations that require assessment of the greenhouse gas emissions of different urban planning options?		
	i.	Do these include provisions that require the assessment of the greenhouse gas emissions associated with the existing urban form?	Yes/No
	ii.	Do these include provisions that require the estimation of existing carbon sinks?	Yes/No
	iii.	Do these include provisions that require the production of different planning scenarios and the estimations of the greenhouse gas emissions associated with each scenario?	Yes/No
	iv.	Do these include provisions that require the production of different planning scenarios and the estimation of the carbon sink potential associated with each scenario?	Yes/No
	v.	Do these include provisions that require the assessment of the plan's ability to meet the local, sub-regional and national governments' climate change strategies and plans, greenhouse gas reduction targets and measures?	Yes/No
	vi.	Do these include the legal requirement for urban plans to have targets to reduce greenhouse gases with measurable and verifiable benchmarks against which progress can be assessed?	Yes/No
	vii.	Do these include the legal requirement to assess the greenhouse gas emissions associated with the urban plans?	Yes/No
Urban form and reduction of greenhouse gas emissions from transportations and infrastructure	4.2 Does your country have provisions of law or regulations that promote a connected, accessible, and dense urban form that reduces car trips, and promotes walkability and the efficient use of public infrastructure?		
	i.	Do these include provisions of law or regulations that promote connectivity, establishing minimum standards for streets?	Yes/No
	ii.	Do these include provisions that promote connectivity through street design standards for walkability and cycling?	Yes/No
	iii.	Do these include provisions that promote connectivity through plot design rules for a walkable streetscape?	Yes/No
	iv.	Do these include provisions to promote accessibility to jobs, housing, services and shopping by promoting mixed land use?	Yes/No
	v.	Do these include provisions that promote optimal urban density?	Yes/No
	vi.	Do these include provisions that require the consideration of existing and planned transport infrastructure in the determining allowed population densities near the infrastructure?	Yes/No
Green spaces for environmental and climate services	4.3 Does your country have provisions of law or regulations that promote a network of green spaces for environmental and climate services?		
	i.	Do these include provisions of law or regulations that establish minimum quantitative standards for green spaces?	Yes/No
	ii.	Do these include provisions of law or regulations that require the adequate distribution of green spaces across the city?	Yes/No
	iii.	Do these include provisions of law or regulations that require connecting and planning together networks of green areas and water bodies?	Yes/No

Neighbourhood design and energy saving in buildings	4.4 Does your country have provisions of law or regulations that require neighbourhood design principles to achieve energy savings in buildings?	
	i. Do these include provisions of law or regulations that require neighbourhood plans to consider wind and sun direction when deciding the orientation and the layout of streets?	Yes/No
	ii. Do these include provisions of law or regulations that require the consideration of the thermal properties of urban surfaces?	Yes/No
	iii. Do these include provisions of law or regulations that require plot design to achieve optimal orientation of the buildings for the purpose of energy saving in buildings?	Yes/No
Development approval and mitigation	4.5 Does your country have provisions of law or regulations to ensure that planning and design standards that mitigate the emissions of greenhouse gases are enforced through the development approval process?	
	i. Do these include provisions that link the development approval process to legally approved urban plans and zoning regulations?	Yes/No
	ii. Do these include provisions that allow local governments to charge developers, either in cash or in kind, through conditions to be attached to the approval of planning applications, for infrastructure costs associated with their developments?	Yes/No
	iii. Do these include mechanisms to monitor the compliance with the approved development and its conditions?	Yes/No
	iv. Do these include mechanisms for enforcement in the event developments are not compliant with the submitted application and its conditions?	Yes/No



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5. ECONOMIC AND NON-ECONOMIC INSTRUMENTS FOR CLIMATE FRIENDLY URBAN PLANNING

The measures described in the previous chapters that cities need to undertake to implement their urban plans, reduce their GHG emissions and better protect their residents from climate change impacts require financial resources. These range from reconfiguring urban planning systems to make them less reliant on vehicle transport to climate proofing new and existing infrastructure to enhance resilience. Globally, it has been estimated that USD16.8 trillion in investments will be required by 2030 in mitigation and adaptation to meet the current NDC commitments.¹⁷⁰ Significant additional financing is required to make urban infrastructure more resilient, especially in the developing world. The global need for urban infrastructure investment amounts to USD 4.5 - 5.4 trillion per year, of which an estimated premium of between 9 and 27 per cent is required to make this infrastructure low-emissions and climate resilient.¹⁷¹ A significant proportion of this demand is from cities in the developing world.¹⁷²

The role of finance in climate change action is widely acknowledged in global agendas. The Addis Ababa Action Agenda recognizes that “funding from all sources, including public and private, bilateral and multilateral, as well as alternative sources of finance, will need to be stepped up for investments in many areas, including for low-carbon and climate

resilient development”.¹⁷³ The NUA also calls for development and expansion of financial instruments related to climate change action. It specifically acknowledges that resources will be needed to improve transport and mobility infrastructure and systems (para 118) and calls for adequate investments in protective, accessible and sustainable infrastructure (para 119). Similarly, finance appears prominently in the Paris Agreement, whereby one of the key objectives is “making finance flows consistent with a pathway towards low GHGs and climate-resilient development”.¹⁷⁴

Effective climate change action in urban areas requires local governments to be adequately financed to undertake their functions. In particular, the elements that have been discussed in the previous chapters – such as developing and implementing urban and regional plans, including risk assessments, slum upgrading, planned relocations, adapting infrastructure, increase green spaces, streets and public spaces, providing water and sanitation infrastructure, among others - will need resources to be actualized. Municipal finance can be divided into two categories: internal revenue which is collected by local governments according to their rules and mandates, and which mostly constitute property taxes and user fees; and external revenue from outside sources, which includes

170 OECD and CPI (2016). Quoted in GGGI Mind the Gap: Bridging the Climate Financing Gap with Innovative Financial Mechanisms, p.2. Current in this case means NDC commitments as of 2020, before any updates are made ahead of CoP26.

171 Cities Climate Finance Leadership Alliance (2015). State of City Climate Finance.

172 Ibid.

173 Addis Ababa Action Agenda of the third International Conference on Financing for Development, para 60.

174 Article 2.1.c

inter-governmental transfers, borrowing and development assistance.¹⁷⁵ These sources are the ones most used by local governments to implement urban plans and build infrastructure. However, there has been concern that municipal finance in many parts of the world is heavily reliant on inter-governmental transfers, property taxes and user fees.¹⁷⁶ This situation not only leaves local governments without adequate resources needed to fulfil their infrastructure and service delivery mandates, but it inhibits their ability to undertake comprehensive local climate action. Constructive effort has thus been made, including by UN-Habitat, to enhance municipal finance by generating a diverse portfolio of income streams. These include municipal bonds, public-private partnerships, tax increment financing, betterment levies, special assessments, development charges and other land value capture taxes etc.¹⁷⁷

As such, this chapter focuses on both public finance and private investments. Public finance has traditionally formed the bulk of climate finance and requires sufficient consideration, which is addressed by an encouragement of inter-governmental transfers and vesting local governments with a revenue collection mandate. Nonetheless, the chapter is cognisant that most countries lack sufficient public funds to cover the mitigation and adaptation costs associated with climate change, a situation that more acutely affects local governments – especially in developing countries. Accordingly, private finance for climate change action in urban areas is also highlighted through a focus on mobilization of investment capital and public-private partnerships. Moreover, behavioural change through incentives and disincentives is appreciated as they play a relevant role in promoting or discouraging specific adaptation and mitigation activities.

175 UN-Habitat (2016). Finance for City Leaders: Handbook.

176 Ibid.

177 Ibid.

5.1. RESOURCES FOR URBAN PLANNING AND CLIMATE CHANGE

5.1.1. INTER-GOVERNMENTAL TRANSFERS

Inter-governmental fiscal transfers are transfers of funds from one level of government to another. They can consist, for example, of conditional or unconditional grants, or shared taxes. As local governments' mandates already cover critical areas related to climate change, including transport, waste management, building and construction and provision of basic services such as water and energy, it is important that functional decentralization is accompanied by fiscal decentralization. Facilitating such transfers is one of the main ways of increasing local climate action, especially if they are linked to climate change-related factors. Portugal, Brazil and India offer examples of countries where ecological considerations play a relevant role in inter-governmental transfers. In Portugal, the *Local Finances Law of 2007* incorporates an explicitly ecological dimension into the distribution of fiscal transfers from national to local governments based on the amount and quality of areas designated for conservation. In Brazil, climate change action at state level is funded through ecological fiscal transfers under the *Imposto Sobre Circulação de Mercadorias e Serviços Ecológico* (ICMSE). ICMS Ecológico began in Paraná State and became a reality in 17 states in all regions of the country.¹⁷⁸ Twenty-five per cent of municipal share is distributed according to ecological considerations (half to conservation units and half to watershed protection).

These criteria include the size of protected areas, the area of the municipality and the protected area's management category. Some states also impose additional environmental criteria, such as protection of water reserves, quality of water, sanitation and treatment of solid waste and sewage.¹⁷⁹ In India, inter-governmental transfers have also been used for climate change mitigation. In 2015, the Finance Commission added forest cover to the formula that determines the amount of tax revenue the government distributes annually to each of India's states, alongside historical population, recent population, poverty and area. From fiscal years 2015–16 to 2019–2020, the government distributed 7.5 per cent of inter-governmental transfers taking into consideration states' forest coverage as a proportion of total land area.¹⁸⁰

In Colombia, *Law 141 of 1994* creates the *National Royalties Fund (NRF)* to collect royalties from non-renewable natural resource extraction (oil, coal, nickel, iron, copper, gold, silver, platinum, salt, limestones) as part of Colombia's strategy for managing natural resources. Financial resources from the NRF are delivered to territorial entities through local investment projects, and are allocated in accordance with the relative environmental, social and economic impacts of the projects.

178 Study of SOS Mata Atlântica Foundation. <https://www.sosma.org.br/noticias/portal-proteja-divulga-legislacoes-estaduais-sobre-icms-ecologico/>

179 See <http://www.undp.org/content/dam/sdfinance/doc/ecological-fiscal-transfer>

180 See <https://www.cgdev.org/sites/default/files/ecological-fiscal-transfers-and-sub-national-budgets-did-forest-based-fiscal-devolution.pdf>

Specific environmental designations for the distribution of royalty funds are given to certain geographic or ecological areas, such as the Amazon, Choco and the archipelago of San

Andres Providencia and Santa Catalina; the recovery and conservation of watersheds; decontamination of the Bogota River; and the preservation of other natural resources.

5.1.2. MANDATE FOR LOCAL REVENUE COLLECTION

Local governments often have limited revenue bases and are often dependent on fiscal transfers from the central government. They may not have the power to levy taxes, as the law gives this mandate to national, provincial or regional governments. Legal frameworks, particularly in developing countries, also limit municipal borrowing, restrict the ability of municipalities to reallocate funds among budget categories, and place caps on certain types of expenditures. This is also the case in the implementation of alternative financial mechanisms, like municipal bonds and green bonds, where rules and regulations may limit the effectiveness of these instruments and the capacity of municipalities to access private capital to finance climate change mitigation and adaptation. To promote climate finance at the local level, legal frameworks should enable local authorities to raise revenue to fulfil their functions, for example by authorizing municipalities to levy taxes such as land-based taxes (property tax, infrastructure charges, land value capture, sale of serviced land, sale of development rights), non-land taxes (licence fees for businesses, taxes on households, taxes on vehicles, etc.) and user charges (services, planning applications and building permits, business registration, market fees) etc.

Iceland's *Planning and Building Act 1997* provides for several development-linked sources of revenue, including building permit fees, road-building levy, parking space levy and connection fees, which must be paid at the building permit application stage (Article 44). The Act also authorizes local authorities to collect permit fees for development projects which influence the environment and change its appearance, and for permits to build, enlarge or alter buildings as well as fees for site measurements, monitoring, inspection and certification provided by building officers (Article 53). Similarly, the Bahamas' *Planning and Subdivision Act 2010* provides that development charges may be levied to cover the increased capital costs required for development-related capital growth studies; fire stations, including vehicles and equipment; transport needs, including roads, structures, pavements, street lights, traffic signals and trails; public works operations, including works yards, vehicles, equipment and services related thereto; parks, including parkland and trail development and equipment and services related thereto; recreation, including major indoor recreational facilities, furnishings and equipment and services related thereto; libraries, including equipment and services related thereto and including materials acquired for circulation, reference or information purposes (Section 32). Development charges are also required under Tanzania's *Urban Planning Act 2007* for every application, including amendment to the planning consent and approval to subdivide land or to change the use of land (Section 46).

5.1.3. AUTHORITY OVER SPENDING DECISIONS

Even with additional funds from inter-governmental transfers and locally generated revenue, local governments may not have sufficient discretion over their use to reduce emissions and energy use or undertake specific adaptation activities. These restrictions may curtail effective climate change mitigation and adaptation in urban areas and, as such, this part is concerned with the extent to which local governments have the authority to decide how to spend revenues within their control. In Iceland, the *Constitution* (Article 78) grants the legal authority of self-government to local authorities.

This principle is reiterated by Article 2 of the *Local Authorities Act 2011*, which provides the basis for autonomy over expenditure by local governments by explicitly stating that local authorities have decision-making powers regarding the use of income bases, borrowings and the allocation of assets (Chapter 2, Article 8). Consequently, local expenditure is characterized by significant spending on areas relevant to climate change action, including environmental protection, provision of housing and community amenities as well as social protection and education.

5.1.4. EARMARKED RESOURCES

The rationale for having earmarked resources is to prevent climate change activities from being side-lined in the budgetary execution process. It is meant to ensure that particular attention is paid to funding climate change action and that identified resources are indeed spent on climate change-related activities. Resources may be earmarked by specifying a percentage in municipal budgets, introducing dedicated budget lines in municipal budgets and establishing specific funds for climate change adaptation and mitigation. Kenya and Philippines offer examples of specially dedicated funds. The Kenya *Public Financial Management (Makueni County Climate Change Fund) Regulations 2015* creates the Makueni County Climate Change Fund, whose specific objective is to provide funding for climate change activities identified in the Makueni County Integrated Development Plan (Section 4). In Philippines, the People's Survival Fund (PSF) was created by the *People's Survival Fund Law 2011* and is designed to integrate adaptation activities of resilience building, disaster risk reduction and poverty alleviation in poor and vulnerable local communities.

Earmarking of resources is also done in Canada and the United States through slightly different means. In Canada, it is by linking funds received from parking space requirements to climate change-related activities, while in the United States, it is through direct provision of state funds to municipalities engaged in adaptation actions. Among the issues addressed by Canada's *(British Columbia) Local Government (Green Communities) Statutes Amendment Act 2008* is a provision that money received under parking space requirements of the Local Government Act needs to be used for the purpose of providing off-street parking spaces, or transport infrastructure that supports walking, bicycling, public transit or other alternative forms of transport. In the US, the *(New York) Community Risk and Resiliency Act 2014* authorizes the provision of assistance payments to municipalities toward the cost of climate change-related projects. These include local waterfront revitalization and coast rehabilitation programmes.

Notably, among the conditions that must be fulfilled by municipalities when these funds are disbursed, is the demonstration that future physical climate risk due to sea level rise, and/or storm surges and/or flooding, based on

available data predicting the likelihood of future extreme weather events, including hazard risk analysis data if applicable, has been considered (Section 10 and 11).

5.1.5. MOBILIZATION OF INVESTMENT CAPITAL

The number of resources required for effective climate change mitigation and adaptation cannot be adequately covered by public finance; many countries' efforts are characterized by budget deficits, austerity measures and competing socio-economic priorities. Climate change-related activities may also require high upfront capital costs and feature long-term income streams, which most governments, especially in developing countries, may not be able to commit to. Accordingly, it is essential that regulatory frameworks facilitate the creation of a supportive environment for the mobilization of investment capital to boost climate finance.

Examples include municipal bonds, green bonds, tax increment financing, project bonds and concessional loans, etc. For instance, in Serbia, amendments to the **Law on Public Debt** in 2011 introduced a municipal bond market and the city of Novi Sad became the first to issue municipal bonds to finance capital expenditures, issuing a EUR 35 million bond with a maturity of 12 years.¹⁸¹ Municipalities and city level agencies such as utility and transport companies are also increasingly using green bonds to finance both adaptation and mitigation efforts as seen in Gothenburg and Johannesburg.¹⁸²

5.1.6. PUBLIC CREDIT GUARANTEE

One of the main concerns for financial institutions, development banks and other private sector investors is the ability of local governments to pay back loans advanced to them. Such concerns can be remedied through a public credit guarantee, whereby the national government guarantees (by promising to take up the payment responsibility) if the lending local government fails to repay the loan. The **Constitution of Kenya** allows county governments to acquire loans if guaranteed by the national government and approved by the county government's assembly (Article 212).

Finland also has a unique guarantee model for local government loans. The **Limited Liability Companies Act 2006** provided the legal basis for setting up the Municipality Finance Corporation (MFC) - a credit institution owned by the state and by municipalities. MFC provides loans at market conditions to municipalities and municipally controlled organizations, and loans are guaranteed by the Municipal Board Guarantee (MBG), of which almost all Finnish municipalities are members.

¹⁸¹ See <https://portal.cor.europa.eu/divisionpowers/Pages/Serbia-Fiscal-Powers.aspx>

¹⁸² WWF (2018). "Financial instruments used by governments for climate change mitigation". Policy Brief.

5.1.7. PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships (PPPs) involve a collaboration between a government agency and a private-sector entity that can be used to finance, build and operate infrastructure. For example, a city government with inadequate resources to undertake a capital-intensive building project may enter into a contract with a private enterprise to fund the construction in exchange for part of operating profits once the project is complete. PPPs are typically found in transport, housing, water, waste management and energy infrastructure. The utility of PPPs is based on economy efficiency gains and reducing government overload. Their major advantage is their ability to offer an off-budget mechanism for mobilizing funds that are not available in the public budgets and acting as additional income sources for local budgets.¹⁸³ The Kenyan *Public Private Partnerships Act 2013* provides that contracting authorities (public bodies) that intend to finance, operate, equip or maintain an infrastructure facility or provide a service may enter into a project agreement with any qualified private party (Section 18). PPPs are supported in two main ways. First, under Section 27, the government may issue a guarantee, undertaking or binding letter where it considers it necessary to support a project in order to reduce premiums factored for political risks issue in relation to a project.

Second, the Act establishes a Project Facilitation Fund, which is intended to support contracting authorities in the preparation phase of a project, the tendering process and project appraisal as well as extending viability gap finance to projects that are desirable but cannot be implemented in the absence of financial support from the government. In Zambia, the *Public Private Partnerships Act 2009* has been used to mitigate the potential effects of reduced precipitation on the country's hydropower generation by enhancing solar power. The Zambian Government partnered with the International Finance Corporation (IFC), the World Bank and the Multilateral Investment Guarantee Agency (MIGA) through the Scaling Solar project to tender two utility-scale development projects where the IFC supported site selection, due diligence and adaptation assessment, the World Bank offered guarantees, and MIGA offered insurance to the project. Accordingly, the winning bids from two renewable energy developers were the lowest priced by cents/kWh of any solar power that had been seen in Zambia prior to the project.¹⁸⁴

183 Niña Boschmann (2009). "Fiscal Decentralization and Options for Donor Harmonization" Development Partners Working Group on Local Governance and Decentralization. December.

184 World Bank Group (2016). "Investing in Urban Resilience: Protecting and Promoting Development in a Changing World" Available at: <https://openknowledge.worldbank.org/handle/10986/25219>

5.2. INCENTIVES FOR MITIGATION AND ADAPTION IN URBAN PLANNING

5.2.1. ECONOMIC INCENTIVES FOR MITIGATION IN URBAN PLANNING

Incentives offer an important mechanism to encourage behaviour and investments towards climate-friendly urbanization. They can be used to make urban planning more resilient and contribute to less GHG concentrations. Examples of economic incentives are: fee or tax waivers, direct grants, municipal property tax rate reduction, tax abatements for infill development, etc. In Canada, the *(British Columbia) Local Government (Green Communities) Statutes Amendment Act 2008* amended Section 933 of the Local Government Act to allow development charges to be waived subject to certain eligibility requirements. These include development that is: (a) not-for-profit rental housing, including supportive living housing; (b) for-profit affordable rental housing; (c) a subdivision of small lots that is designed to result in low greenhouse gas emissions; and (d) a development that is designed to result in a low environmental impact (Section 27). Another example is the *California Sustainable Communities Act*, which gives the metropolitan planning organization or county transport agency the power to consider financial incentives for counties that contribute towards the greenhouse gas emission reduction targets by implementing policies for growth to occur within their cities (Section 4).

The *Carbon Tax Law* of Colombia (Law 1819 of 2016) is another example; it exempts corporations that are certified as carbon neutral, in accordance with the regulations issued by the Ministry of the Environment and Sustainable Development from the National Carbon Tax. It also contains tax incentives for companies that sell electrical energy generated based on wind energy, biomass or agricultural, solar, geothermal or marine waste. Moreover, *Law 1715 of 2014* introduces incentives for investment projects in non-conventional energy sources. Article 11 provides incentives in net income for taxpayers involved in research, development and investment in the field of electric energy production with FNCE (non-conventional sources of energy) and efficient energy management. Those who directly invest are entitled to deduct up to 50 per cent of the total investment made for a period not exceeding 15 years. Articles 12 to 14 describe other incentives for developing or maintaining non-conventional energy sources, such as VAT tax incentives, exemption from import duties and accelerated depreciation applicable to equipment, elements, machinery and other domestic or imported inputs.

5.2.2. NON-FINANCIAL INCENTIVES FOR MITIGATION IN URBAN PLANNING

Non-economic incentives are provided by planning authorities to developers and private parties to compensate them for their losses or their endeavours to realize certain planning goals. These can consist of additional development rights, reduced planning requirements, reduced bureaucratic requirements, fast-tracking of the

planning applications, and public investment in infrastructure required by the developer, etc. Under the Bahamas' *Planning and Subdivision Act 2010*, for instance, the planning committee may authorize increases in the height and density of development otherwise permitted in a zoning bylaw in return for the provision of

facilities, services or other matters, such as additional open space, community facilities, preservation of heritage buildings or structures,

the preservation of natural features, or any other public benefit (Section 29.1).

5.2.3. ECONOMIC INCENTIVES FOR ADAPTATION IN URBAN PLANNING

Similar to mitigation, examples of economic incentives that can facilitate uptake of adaptation activities include tax waivers, direct grants, municipal property tax rate reduction, tax abatements for infill development, etc. Indonesia's *Spatial Planning Law 2007* defines an incentive as a means or effort to reward an act performed accordingly and includes tax deduction, compensation, cross subsidizing, reward, spatial rent and collected stock. It then allows both the national and local governments to give incentives or disincentive to promote adherence with the spatial plans (Article 38).

The US State of New Jersey passed the *Brownfields Redevelopment Incentive Programme Act (the Brownfields Act)* as part of the broader New Jersey Economic Recovery Act of 2020 (the Recovery Act) (A4/S3925). The Brownfields Act authorizes USD 50 million in annual tax credits over six years to eligible developers of under-used, contaminated commercial properties, known as "brownfields". The tax credits are meant to compensate developers for the costs of cleaning up brownfields before development, thus are meant to not only limit greenfield development but also enhance the liveability and adaptive capacity of urban areas.

5.2.4. NON-FINANCIAL INCENTIVES FOR ADAPTATION IN URBAN PLANNING

Incentives of a non-financial nature may also be provided for climate-change adaptation. Under Papua New Guinea's *Manam Resettlement Authority Act 2016*, non-financial incentives take the form of provision of services and infrastructure for the resettlement area, including building access roads, an airstrip, schools, aid posts and ensuring a safe water supply. The provisions of the Bahamas' *Planning and Subdivision Act 2010* - which authorize the

planning committee to provide non-financial incentives such as increased height and density of development in return for the provision of facilities, services or other matters such as additional open space, community facilities, preservation of heritage buildings or structures, the preservation of natural features or any other public benefit - also apply to adaptation (Section 29.1).

5.3. INCENTIVES THAT UNDERMINE SUSTAINABLE URBAN LAND USES

5.3.1. ECONOMIC INCENTIVES FOR UNSUSTAINABLE URBAN LAND USES

Unlike the previous sub-section where the focus is on incentives that promote climate friendly urban planning and land use, this section is on incentives that undermine these objectives. The intention of this part is to highlight how governments and policymakers may be deliberately or inadvertently hindering progress towards reduced GHG concentrations and better resilience to climate change effects through certain instruments. These include land and property tax exemptions that favour greenfield development, fossil fuel subsidies that incentivize urban sprawl and private car use, new development in thinly populated and newly developing areas, mortgage finance regulation and subsidies that direct jobs and industry away from cities' core areas, among others. In the United States, there are 12 provisions in the **Tax Code** that subsidize activities associated with the production of fossil fuels.

These subsidies not only promote vehicular use and excessive energy consumption, but also result in loss of revenue.¹⁸⁵ The Canadian **Income Tax Act** also contains provisions that incentivize the fossil fuel industry to extract oil, gas and coal by allowing fossil fuel companies to deduct certain expenses from their income.¹⁸⁶ Such subsidies are credited with contributing to higher GHGs, more local air pollution and congestion, as well as crowding out investment in clean energy.¹⁸⁷ Another example of an incentive which encourages unsustainable urban land uses is provision of mortgage finance for development in geographic areas that are prone to acute climate shocks. In the United States for instance, it has been shown that two of the largest purchasers of securitized mortgages - Fannie Mae and Freddie Mac - do not adequately factor in climate risks and continue to offer finance for developments in risky areas.¹⁸⁸

5.3.2. NON-ECONOMIC INCENTIVES FOR UNSUSTAINABLE URBAN LAND USES

Certain non-financial incentives are just as influential in encouraging unsustainable urban land uses as economic ones. Examples include subsidized infrastructure to sprawling and low-density developments, subsidies to particular types of transport infrastructures, subsidized costs of providing public services such as water,

energy, sanitation, private transport, parking, road pricing, etc. A prominent example of an unsustainable incentive is provision of free, off-street parking space through minimum parking requirements. **Zoning Rules** in Minnesota require the provision of off-street parking.

¹⁸⁵ Joseph E Aldy. Proposal 5: Eliminating Fossil Fuel Subsidies, The Hamilton Project.

¹⁸⁶ Yanick Touchette and Philip Gas (2018). Public Cash for Oil and Gas: Mapping federal fiscal support for fossil fuels. International Institute for Sustainable Development.

¹⁸⁷ See <https://www.unenvironment.org/explore-topics/green-economy/what-we-do/economic-and-fiscal-policy/fiscal-policy/policy-analysis-3>

¹⁸⁸ Amine Ouazad and Matthew E. Kahn (2020). "Mortgage Finance in the Face of Rising Climate Risks." Working Paper, National Bureau of Economic Research.

For instance, theatres should provide one parking space per four seats; one space per occupancy unit for hotels; and eight spaces per 1,000 square feet Gross Floor Area (GFA) for bars.¹⁸⁹ The *Land Use and Development Code* of the City of Durango in Colorado also requires two spaces per one bedroom unit; 1.1 spaces per guest room for hotels; and one space per 50 square feet of Customer Access Area for bars.¹⁹⁰ These requirements often lead to the creation of excess, poorly distributed and under-used parking facilities, which is counter-productive to strategies aimed at promoting walking, cycling and mass public transit. Free parking encourages planners to allocate valuable urban space to an activity that creates few marginal benefits and makes users more likely to use private cars than resort to other sustainable means such as public transport.¹⁹¹

Another non-economic incentive that has been credited with encouraging unsustainable land uses are zoning regulations that favour single-family residential homes. Such regulations prohibit higher-density housing. For instance, in the United States, up to 75 per cent of residential land in many cities is reserved for detached single-family homes. This housing type is characterized by sprawling development that engenders car dependency and incentives less energy-efficient building designs. Between 1960 and 2010, US urban land area grew at a rate 1.7 times faster than population growth. To connect all the housing and activities spread across so many more square miles, the average American's daily travel mileage increased by 85 per cent between 1969 and 2017.¹⁹² The high GHG emissions by the United States has been attributed to its reliance on car usage as the prevalent mode of transport.

189 See https://mn.gov/caapb/assets/09-parking-loading_tcm1087-298333.pdf

190 See <http://online.encodeplus.com/regs/durango-co/doc-viewer.aspx?tocid=004.005.002#secid-263>

191 OECD (2017). *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations*.

192 Aldie Tomer, Joseph Kane, Jenny Schuetz and Caroline George (2021). "We can't beat the climate crisis without rethinking land use." Brookings. 12 May, 2021. Available at <https://www-brookings-edu.cdn.ampproject.org/c/s/www.brookings.edu/research/we-cant-beat-the-climate-crisis-without-rethinking-land-use/?amp>

TABLE 5. Economic and Non-Economic Instruments for Climate Friendly Urban Planning

Resources for urban planning and climate change	5.1 Does your country have provisions of law or regulations that create a flow of resources to finance climate change mitigation and adaption in urban planning?		
	i.	Do these include provisions that establish earmarked inter-governmental fiscal transfers to local governments for climate change mitigation and adaption in urban planning?	Yes/No
	ii.	Do these include provisions that give local governments the responsibility to collect locally generated revenues?	Yes/No
	iii.	Do these include provisions that give local governments the authority to decide how to spend locally generated revenues?	Yes/No
	iv.	Do these include provisions that require local governments to earmark resources for urban planning and climate change?	Yes/No
	v.	Do these include provisions that create enabling environment that facilitate the mobilization of investment capital?	Yes/No
	vi.	Do these include provisions that allow local governments to receive a public credit guarantee by the national government?	Yes/No
	vii.	Do these include provisions that create frameworks for public-private partnerships?	Yes/No
Incentives for mitigation and adaption in urban planning	5.2 Does your country have provisions of law or regulations that create incentives to achieve climate change mitigation and adaptation objectives in urban planning?		
	i.	Do these include economic incentives to support climate change mitigation in urban planning?	Yes/No
	ii.	Do these include non-economic incentives to support climate change mitigation in urban planning?	Yes/No
	iii.	Do these include economic incentives to support climate change adaption in urban planning?	Yes/No
	iv.	Do these include non-economic incentives to support climate change adaption in urban planning?	Yes/No
Incentives that promote unsustainable urban land uses	5.3 Does your country have provisions of law or regulations that create incentives to promote unsustainable urban land uses		
	i.	Do these include economic incentives that promote unsustainable urban land uses?	Yes/No
	ii.	Do these include non-economic incentives that promote unsustainable urban land uses?	Yes/No

6. Conclusion

IPCC's Sixth Assessment Report has made it clear that the current scale and nature of changes are unprecedented over hundreds of thousands of years and that some impacts are irreversible for centuries to come. The risk of facing multiple hazards at the same time is rising, and the existential threat of crossing planetary tipping points cannot be ruled out. Climate and weather extremes and their adverse impacts on people and nature will continue to increase with every additional increment of rising temperatures, and the increased risk will pose an even greater strain on those already feeling the impacts of climate change, as highlighted in chapter 3. Accordingly, the United Nations Secretary General, António Guterres, has described the IPCC report as a "code red for humanity" and noted that the "alarm bells" for drastic climate action are "deafening".

While the Sixth Assessment Report paints a grim picture, it also points out that with immediate, aggressive, rapid and widespread emissions cuts, the current trajectory can be slowed down and most of the projected impacts avoided. This glimmer of hope has been articulated through the Glasgow Climate Pact (outcome of COP 26) which, in addition to calling for rapid, deep and sustained reductions in GHGs, underscored the necessity of finance, capacity-building and technology transfer, to enhance adaptive capacity, strengthen resilience and reduce vulnerability. Notably, it gives urban areas an opportune entry point into enhancing climate action and helping to avoid the projected impacts by recognizing the importance of integrating climate change adaptation into both local and national planning.

It highlights the important role played by local and regional governments (in addition to other stakeholders such as civil society, Indigenous Peoples and local communities) in contributing to progress towards the objectives of the UNFCCC and the goals of the Paris Agreement.

The role of urban areas in climate change action is also articulated by the IPCC¹⁹³, which has observed that the global trend of urbanization offers a critical but time-limited opportunity to advance climate-resilient development, and that integrated and inclusive planning of urban infrastructure can significantly increase the adaptive capacity of urban and rural settlements. Key among the tools that can be used to promote urban-related climate action are supportive regulatory and institutional frameworks. These are useful for not only setting legally binding obligations but also creating oversight bodies and coordination mechanisms to bring together and clarify responsibilities across levels of government. They may also lay down obligations to mainstream climate change action into national and sub-national plans as well as integrate important democratic elements, such as the right to public participation, access to information and access to justice. As such, this Urban Law and Climate Change publication aims to complement the online version of the Law and Climate Change Toolkit in facilitating the establishment of legal frameworks that are crucial for effective domestic implementation of the Paris Agreement by focusing on the urban context.

193 IPCC (2022). Working Group II contribution to the Sixth Assessment Report: Report on Impacts, Adaptation and Vulnerability.

References

Albert Fiadjoe (2004). *Alternative Dispute Resolution: A Developing World Perspective*. Cavendish Publishing Limited, London, U.K.

Aldie Tomer, Joseph Kane, Jenny Schuetz and Caroline George (2021). "We can't beat the climate crisis without rethinking land use." *Brookings*. 12 May, 2021. Available at: <https://www-brookings-edu.cdn.ampproject.org/c/s/www.brookings.edu/research/we-cant-beat-the-climate-crisis-without-rethinking-land-use/?amp>

Amine Ouazad and Matthew E. Kahn. (2020). "Mortgage Finance in the Face of Rising Climate Risks." *Working Paper, National Bureau of Economic Research*.

Andy Gouldson, Andrew Sudmant, Haneen Khreis and Effie Papargyropoulou (2018). *The Economic and Social Benefits of Low-Carbon Cities: A Systematic Review of the Evidence*. Coalition for Urban Transitions, London, U.K.

Anne Siders (2013). *Managed Coastal Retreat: A Legal Handbook on Shifting Development Away from Vulnerable Areas*. Columbia Centre for Climate Change Law, Columbia Law School.

Brookings Institution, Georgetown University and UNHCR (2015). *Guidance on Protecting People from Disasters and Environmental Change through Planned Relocations*.

Centre for Transit Oriented Development (2013). Implementing Equitable Transit Oriented Communities; *Appendix A: Literature Review of Review into Transit Supportive Densities*. For Puget Sound Regional Council. Available at http://www.psrc.org/assets/9179/GTC_Implementation_Report_SE011116withblankpage.pdf.

Cities Climate Finance Leadership Alliance (2015). *State of City Climate Finance*.

Coalition for Urban Transitions (2019). *Climate Emergency-Urban Opportunity*.

Daniel Baldwin Hess and Peter A. Lombardi.(2004). "Policy Support for and Barriers to Transit-Oriented Development in the Inner City: Literature Review" *Transportation Research Record: Journal of the Transportation Research Board*. 1887(1).

Diego Navarra and Paul Van Der Molen (2013). "A Global Perspective On Cadastres & Geo-ict For Sustainable Urban Governance In View Of Climate Change." *Architecture, City and Environment* 8(24).

Federico M. Butera (2018). *Energy and Resource Efficient Urban Neighbourhood Design Principles for Tropical Countries: A Practitioner's Guidebook*. UN-Habitat, Nairobi, Kenya.

GGGI (2016). *Mind the Gap: Bridging the Climate Financing Gap with Innovative Financial Mechanisms*.

Gillian Cambers (1998). *Planning for Coastline Change: Coastal Development Setback Guidelines in Antigua and Barbuda*. UNESCO.

GIZ (2020). *Multi-Level Climate Governance Supporting Local Action*.

Greenberg M.R. and Renne J. (2005). "Where does walkability matter the most? An environmental justice interpretation of New Jersey data." *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 82(1).

Hajat, S., M. O'Connor and T. Kosatsky (2010). "Health effects of hot weather: from awareness of risk factors to effective health protection." *The Lancet*, 375.

Healey, P. (2004). "The treatment of space and place in the new strategic spatial planning in Europe." *International Journal of Urban and Regional Research* 28(1).

Hens Runhaar (2018). "Mainstreaming climate adaptation: taking stock about what works from empirical research worldwide." *Regional Environmental Change*.

Hernando De Soto (2000). *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Black Swan, London, U.K.

ICLEI (2016). "Curitiba, Brazil: A Model for Transit Oriented Development." *ICLEI Case Studies*.

IPCC (2018). "Summary for Policymakers". In *Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels*.

IPCC (2014). *AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap8_FINAL.pdf

IPCC (2022). *Working Group II contribution to the Sixth Assessment Report: Report on Impacts, Adaptation and Vulnerability*.

Jan Corfee-Morlot, Lamia Kamal-Chaoui, Michael G. Donovan, Ian Cochran, Alexis Robert and Pierre-Jonathan Teasdale (2009). "Cities, Climate Change and Multilevel Governance", *OECD Environmental Working Papers No. 14*. OECD.

Jonathan Martin, Rolf Pendall and William Fulton (2002). *Holding the Line: Urban Containment in the United States*. Brookings Institution Centre on Urban and Metropolitan Policy, Washington, U. S.

Kathryn Brown and Ana Mijic (2019). "Integrating green and blue spaces into our cities: Making it happen." *Grantham Institute Briefing Paper* 30.

Law Commission of England and Wales. "Data Sharing Between Public Bodies: A Consultation Paper." *Consultation Paper No 214*.

Li H., Harvey J., Holland T. and Kayhanian M. (2013). "The use of reflective and permeable pavements as a potential practice for heat island mitigation and stormwater management." *Environmental Research Letters*, 8(1).

Marc Galanter (1974). Why the "Haves" Come out Ahead: Speculations on the Limits of Legal Change." *Law & Society Review* 9(1).

Maryanti, M. R., H. Khadijah, A. Muhammad Uzair and M. A. R. Megat Mohd Ghazali (2016). "The urban green space provision using the standards approach: issues and challenges of its implementation in Malaysia." *Sustainable Development and Planning*.

Niña Boschmann (2009). "Fiscal Decentralization and Options for Donor Harmonization." *Development Partners Working Group on Local Governance and Decentralization*.

Norwegian Ministry of Climate and the Environment (2013). *Climate Change Adaptation in Norway: Report to the Storting*.

OECD (2017). *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations*.

OECD (2020). *Transport Bridging Divides* (2020).

Osler Iris Tam (2021). "Why 15-minute neighbourhoods may be more popular now than ever" (12 January, 2021). Available at <https://www.osler.com/en/resources/regulations/2021/why-15-minute-neighbourhoods-may-be-more-popular-now-than-ever>

Paris Committee of Capacity-Building (2019). *Coherence and coordination of capacity-building activities of constituted bodies and in other relevant processes under the Convention*. UNFCCC.

Peter Yeung (2021). "How '15-minute cities' will change the way we socialise." *BBC Worklife* (4 January, 2021). Available at <https://www.bbc.com/worklife/article/20201214-how-15-minute-cities-will-change-the-way-we-socialise>

Rachelle Alterman and Cygal Pellach (eds.) (2021). *Regulating Coastal Zone: International Perspectives on Land Management Instruments*. Routledge, London, U. K.

Tim Hanstad (1998). "Designing Land Registration Systems for Developing Countries," *American University International Law Review* 13(3).

UN-Habitat (2012). *Handling Land: Innovative Tools for Land Governance and Secure Tenure*.

UNCSD (2012). "Sustainable, low-carbon transport in emerging and developing economies: *Rio 2012 Issues Briefs* 13.

UNDESA (2018). *2018 Revision of World Urbanization Prospects*.

UNDP (2010). *Mapping Climate Change Vulnerability and Impact Scenarios: A Guidebook for Sub-National Planners*.

UNEP (2015). *Putting Rio Principle 10 into Action: An Implementation Guide*.

UNEP (2013). *Where will the water go? Impacts of accelerated glacier melt in the Tropical Andes*. GEAS.

UNESCAP (2020). *Vertical Integration of Climate Change Policies and Actions in Asia-Pacific Countries*.

UNFCCC (2011). *Assessing the Costs and Benefits of Adaptation Options: An Overview of Approaches*.

UNFCCC (2012). *Technical Paper, Slow Onset Events*. 26 November, FCCC/TP/2012/7.

UN-Habitat (2018). *Addressing the Most Vulnerable First: Pro-Poor Climate Action in Informal Settlements*.

UN-Habitat (2011). *Cities and Climate Change*.

UN-Habitat (2015). *Ejido Land Tenure and Registration System: Mexico Case Study*.

UN-Habitat (2018). *Energy and Resource Efficient Urban Neighbourhood Design Principles for Tropical Countries: A Practitioner's Guidebook*.

UN-Habitat (2018). *Energy and Resource Efficient Urban Neighbourhood Design Principles for Tropical Countries: A Practitioner's Guidebook*.

UN-Habitat (2020). *Enhancing Nationally Determined Contributions through urban climate action*.

UN-Habitat (2016). *Finance for City Leaders: Handbook*.

UN-Habitat (2020). *Global State of Metropolis 2020: Population Data Booklet*.

UN-Habitat (2020). *Human Rights, Rule of Law and the New Urban Agenda*.

UN-Habitat (2015). *International Guidelines on Urban and Territorial Planning*.

UN-Habitat (2019). *Land Tenure and Climate Variability*.

UN-Habitat (2020). *Promoting Energy Efficiency in Buildings in East Africa: Technical Note 7- Energy and Resource Efficiency Checklist*.

UN-Habitat (2008). *Secure Land Rights for All*.

UN-Habitat (2013). *Streets as Public Spaces and Drivers of Urban Prosperity*.

UN-Habitat (2013). *Supply of Land for Development: Land Readjustment Experience in Gujarat, India*.

UN-Habitat (2016). *World Cities Report 2016*.

UNHCR, Georgetown University and IOM (2017). *A Toolbox: Planning Relocations to Protect People from Disasters and Environmental Change*.

United Kingdom Department for Transport (2007). *Manual for Streets*. Thomas Telford Publishing.

WHO (2010). *Environment and Health: From Evidence to Policy Action*.

WHO (2017). *Urban green spaces: a brief for action*.

World Bank (2017). *Governance and the Law*.

WWF (2018). "Financial instruments used by governments for climate change mitigation". *Policy Brief*.

Yanick Touchette and Philip Gas (2018). *Public Cash for Oil and Gas: Mapping federal fiscal support for fossil fuels*. IIED.

Urban areas account for two thirds of greenhouse gas emissions and energy consumption, making them major contributors to climate change. Ironically, they also stand to be severely affected by the negative impacts associated with climate change. Cities are already suffering from extreme weather events, flooding, subsidence, storms, heat waves, water scarcity, droughts, and sea-level rise, among other climate change effects. Additionally, in many countries, the laws, institutions, and policies governing urban planning in cities have unintended effects on their capacity to adapt to the changing climate and promote urban forms that increase GHG emissions.

To address this gap, UN-Habitat is pleased to have collaborated with the Commonwealth Secretariat, the United Nations Environment Programme, and the UNFCCC Secretariat in developing the Urban Law Module of the Law and Climate Change Toolkit – an innovative online tool designed to help countries establish legal frameworks necessary for effective domestic implementation of the Paris Agreement – to which this publication on Urban Planning Law for Climate Smart Cities is a guide on. It is hoped that this publication, together with the online version of the Toolkit, will be instrumental in fulfilling the potential of urban areas to lead the way and be truly transformative spaces for climate action. The Module is comprised of the following five sections: governance framework for urban and climate planning; urban and territorial planning; urban planning and design for adaptation; urban planning and design for mitigation and economic and non-economic instruments for climate friendly urban planning.

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