

National Habitat Report
The Republic of the Union of Myanmar

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The United Nations Conference on
Housing and Sustainable Urban Development

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Contents

Foreword.....	4
Introduction.....	6
1. Background.....	9
1.1 Geographic and Socio-Economic Characteristics.....	9
1.2 Political Context.....	10
1.3 Administrative Topography.....	12
2. Urban Demographics.....	14
2.1 Current Level of Urbanization.....	14
2.2 Drivers of Urbanization.....	15
2.2.1 Growth due to Natural Increase.....	15
2.2.2 Rural-Urban Migration.....	15
2.2.3 Industrial Demand.....	17
2.3 Projections of Future Urbanization.....	18
3. Urban Development.....	20
3.1 Land and Urban Planning.....	20
3.1.1 National Level Policies and Frameworks.....	21
3.1.2 Establishment of Urban Planning.....	24
3.1.3 Urban Planning Legislation.....	28
3.2 Housing.....	29
3.2.1 National Housing Policy.....	30
3.2.2 Housing Finance.....	30
3.2.3 Informal Settlements.....	30
3.3 Urban Basic Services and Infrastructure.....	31
3.3.1 Electricity supply.....	31
3.3.2 Access to Safe Drinking Water.....	32
3.3.3 Sanitation.....	33
3.3.4 Solid waste management.....	35
4. Environment and Urbanization.....	36
4.1 Climate Change.....	36
4.1.1 Background of Climate Change in Myanmar.....	36
4.1.2 Impacts of Climate Change to Urban Areas.....	36
4.1.3 Current Policy and Practices.....	38

4.1.4 Future Response to Climate Change	39
4.2 Disaster Risk Reduction.....	40
4.2.1 Disaster Risk Profile of Myanmar	40
4.2.2 Ongoing Efforts in Urban DRR	41

Foreword



H.E. U Win Khaing

Myanmar has been attempting to enter the new era of prosperity through an inclusive development internally, as well as through stronger participation on the international stage. With infrastructure and urban development playing a crucial role in such transformation, the Ministry of Construction has been one of the key players in that endeavor. It is also crucial to establish the National Spatial Development Plan with an integration of socio-economic planning, urban planning, transportation, infrastructure investment planning and industrial planning through working together with sector ministries at the national level and State and Regional Governments for the sustainable and inclusive development of human settlements in Myanmar.

The National Economic Policy announced in July 2016 by the newly democratically elected government includes the following policy measure among 12 measures: “To construct sustainable cities for long-term protection of the environment, improvement of public services, and creation of public places and increase protection actions for cultural heritage.”

The policy measure has brought renewed focus on urban development and housing issues. The Ministry of Construction is committed to a number of priority programs over the coming years to enable achievement of the new urban agenda goals of sustainable, inclusive, and resilient urban development. These include the million houses program, the development of a National Urban policy, National Housing Law, and a new National Urban and Regional Development Planning Law; a National Building Code, urban-rural linkages and connectivity and rural road connections for growth and trade and mainstreaming of Climate Change into the development agenda.

The advent of a new political order of democracy and development in Myanmar sees properly managed urbanization as central to national development. Myanmar though one of the least

urbanized countries in Asia, has the late-comer's benefit of learning from well documented case studies of both rapid urbanization and as well as properly managed urbanization. The government is very cognizant of the fact that Myanmar is a largely agricultural society with deep roots to the land. A key policy goal is ensuring an inclusive and balanced urbanization. The government seeks to ensure that the benefits of urban population growth is prudently managed through dispersal amongst secondary cities

Myanmar is committed to The New Urban Agenda and views it as a powerful means which can unify the UN in its approach to the world's cities. The agenda will of course need effective implementation and monitoring means and mechanisms. Equally important is the need for country level UN Development Assistance Frameworks to ensure UN support.

UN-Habitat since its inception as UNCHS in 1978 has been a reliable technical partner in development for Myanmar. The Ministry of Construction highly appreciate its technical contribution in ensuring sustainable urban development and looks forward to a reaffirmation of UN-Habitat's mandate with a stronger and better resourced agency.

H.E. Win Khaing

Union Minister of Construction
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Introduction

At present, more than half of the world's population is living in cities, and by the year 2050 the world's urban population is expected to nearly double¹. This poses massive sustainability challenges in terms of housing, infrastructure, basic services, and jobs among others. As such, there is a need to address the way cities and human settlements are planned, developed, governed and managed.

Recognizing the magnitude and consequences of rapid urbanization, the first United Nations Conference on Human Settlements was held in Vancouver, Canada in 1976. The outcome of this conference was the adoption of the Vancouver Declaration on Human Settlements, which carried out recommendations for National Action, and the establishment of the United Nations Centre for Human Settlements in 1978, which later became the United Nations Human Settlements Agency (UN-Habitat). The second United Nations Conference on Human Settlements, Habitat II, took place in Istanbul, Turkey in 1996. With the adoption of the Habitat II Agenda as a result of this conference, Heads of State and Government committed themselves to two main goals: "Adequate Shelter for All" and "Sustainable Human Settlements in an Urbanizing World"; and to implementing a Plan of Action based on these goals.

The Third United Nations Conference on Housing and Sustainable Urban Development - Habitat III will take place in October 2016. The conference will bring together all relevant stakeholders, including regional and local authorities, civil society organizations, the private sector, urban professionals, and technical, scientific and academic communities, to review urban and housing policies affecting the future of cities within an international governance structure. The conference will generate a New Urban Agenda, which harnesses the potential of cities and human settlements to help eradicate poverty in all its forms and dimensions, reduce inequalities, promote inclusive growth, and achieve sustainable development. The adoption of the new Agenda will be the first step towards operationalizing sustainable urban development in an integrated and coordinated way at global, regional, national, sub-national and local levels. Further, its implementation will drive the achievement of SDG 11 of making cities and human settlements inclusive, safe, resilient, and sustainable, as well as of other relevant goals and targets across the whole 2030 Agenda for Sustainable Development.

The purpose of the National Report is to take stock of Myanmar's current status of human settlements, identify ongoing projects and innovations, and look at a prospective emerging vision for human settlements in Myanmar towards the creation of the new urban agenda at Habitat III.

While the urban development sector in Myanmar is still in its very early stages of development against the backdrop of ongoing institutional and political reforms leading to democratization and

¹ UN-Habitat, 2016. <https://www.habitat3.org/>

opening of the economy, the new Government has renewed the focus on urban issues and significant transformations have been seen in just the past few years since 2012. These include the development of national-level policies such as a National Urban Policy setting the foundation for well-managed, sustainable urbanization, and a National Housing Policy that aims for inclusive and affordable housing for all citizens; a National Spatial Development Framework as a first step towards integrated spatial planning and balanced urban growth by assigning strategic value to various towns and cities in Myanmar; and the Myanmar National Building Code which includes measures of safety and disaster-sensible use of materials, construction technics and technologies, as well as specific provisions for energy and water supply efficiency contributing to the sustainable growth of urban areas. Additionally, legal frameworks such as the Urban and Regional Planning Development Law are being established to guide the development of spatial plans, integrating environmental and social concerns. Moreover, institutional reforms are being implemented to support the decentralization of planning authorities, and urban planning on the local level was established after decades of absence in 2012. Outside major cities, the Government of Myanmar is pursuing small-scale settlement planning, particularly focussed on small villages in forest areas and regularizing the villages for habitation under the General Administration Department.

Myanmar ranks among one of the countries at highest risk to natural hazards, due to its degree of vulnerability to natural hazards. Both cities and towns in Myanmar are exposed to recurring rapid on-set natural hazards, such as cyclones and floods, which are exacerbated by global climatic changes. As such, Myanmar is also taking measures to mainstream climate change into climate-sensitive sectoral policies, including urban development and closely related sectors. The NLD government has renewed this focus, redeveloping urban concept plans to increase resilience to disasters. In addition, given its advantage of being at comparatively early stages of urbanization and having the opportunity to steer the process towards achieving urban resilience, Myanmar acknowledges the need to engage early in the impending process of urbanization to create resilient, sustainable and low-carbon towns and cities, regardless their size, and over the long-term through realistic means².

The National Report for Myanmar is divided into 5 Sections. Section 1 provides a brief summary of the background, including geographic and socio-economic characteristics, the political context and unique administrative topography which influence the understanding of urban demographics and various aspects of urban development in Myanmar. Section 2 provides a snapshot of urban demographics in Myanmar, describing the current trends of urban growth and population dynamics, drivers of urbanization as well as projections for future urbanization. Section 3 encompasses the issues of land and urban planning, housing, and urban basic services and infrastructure. This section highlights the achievements and current efforts of various tiers of government in Myanmar towards strategic, integrated and coordinated planning among sectors closely related to urban development (i.e. housing, infrastructure, basic services and transportation), as well as future plans

² Myanmar Climate Change Strategy and Action Plans, 2016-2030.

to address the challenges that these sectors face with the goal of achieving inclusive and sustainable urban growth. Transformations in urban governance, legislation and economy which support development in these sectors are also integrated into this section. Section 4 describes environment and urbanization issues in respect of climate change and disaster risk reduction in Myanmar. Section 5 presents case studies of successful initiatives and policy measures that have made significant impacts in the realm of urban development in Myanmar.

1. Background

1.1 Geographic and Socio-Economic Characteristics

The Republic of the Union of Myanmar is the largest Southeast Asian country, with a land area of 676,577 square kilometers. The population is 51.48 million as of 2014, with an average population growth rate of 1.3 percent. Of the total population, 70.4 percent (36.58 million) lives in rural areas. The remaining 29.6 percent (14.9 million) lives in urban areas, 20 percent of which reside in Yangon and Mandalay³.

The country is divided into 14 states and regions, and the capital region of Nay Pyi Taw. In the plains are the regions of Ayeyarwady, Bago, Magway, Mandalay, Sagaing, Tanintharyi, and Yangon, where the majority of the population is of Bamar ethnicity. The states of Chin, Kachin, Kayah, Kayin, Mon, Rakhine, and Shan are located in the upland areas and are largely populated by non-Bamar ethnic groups. About 135 different ethnic minorities and 100 different languages make the country diverse. Figure 1.1 is a map of major urban areas in Myanmar.

Myanmar's Gross Domestic Product (GDP) has continued developing in recent years, with a peak of 8.70 percent growth in 2014 compared to 2013. The country has further growth potential, with its rich variety of natural resources such as natural gas, oil, timber, gems, and precious stones, a rich and diversified agricultural base and open access to sea. Favorably located between South and East Asia, Myanmar has access to the fast growing economies of China and India, together with access to ASEAN countries. It is a member of ASEAN, and a strong proponent of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

The sectoral composition of GDP in Myanmar is changing, with the share of the primary sectors like agriculture and forestry contributing less, and productivity, manufacturing and service sectors contributing more. Contribution of the service sector to GDP is slightly below 40 percent, whilst agriculture sector contributes about 30 percent. Industry, which includes mining and the natural gas and energy sectors, accounts for about 30 percent of GDP⁴.

Due to its geophysical location, Myanmar is prone to a range of natural hazards as well as long term climate change impacts. Impacts of climate change are already being felt in terms of changes in weather patterns, and in the future it may exacerbate disaster risks. Cyclone Nargis in 2008 was the worst natural disaster in the history of Myanmar, and the most devastating cyclone to strike Asia since 1991. Some 2.4 million people were severely affected by the cyclone, and an estimated 138,000 people were killed. While natural hazards are part of the environment, disaster risks are intrinsically linked to development.

^{3 4} Myanmar Climate Change Strategy and Action Plans, 2016-2030.

Figure 1.1: Map of townships and major urban centers in Myanmar



Source: <http://www.tni.org/briefing/ethnic-politics-burma-time-solutions>

1.2 Political Context

Since 2011, Myanmar has been engaged in an active process of institutional and political reform leading to democratization, and is gearing towards further socio-economic change and development. In 2008 a new Constitution was promulgated, guaranteeing basic rights to all

citizens including the right to own and use lawfully acquired properties, the right to pursue trade of own choice, protection of the privacy and security of home, and prohibition of forced labor. The 2008 Constitution adopted a multi-party political system and a market economy as the way forward for democracy and economic prosperity, putting an end to five decades of military rule.

Following the establishment of the new Constitution and subsequently a new government, Myanmar has made significant progress in not only with regard to political reform and economic growth, but also in development in socio-economic sectors including urban development, and is aspiring to become a “modern, developed and democratic nation” by 2030. The country aims to achieve this overarching development goal focusing on all three key aspects of sustainable development i.e. economic, social and environment. The country has already started receiving benefits of structural transformation in economic sector, balanced and proportionate development among regions and states guided by Framework for Economic and Social Reform (FESR). The current economic growth is projected to accelerate due to political reform, stability in political environment and strong foreign investment.

Myanmar general elections were held on 8 November 2015. These were the first openly contested elections held in Myanmar since 1990. The results gave the National League for Democracy (NLD), the main opposition to the former ruling military-backed Union Solidarity and Development Party (USDP), an absolute majority of seats in both chambers of the national parliament.

The national government and a number of ministries have already prepared new policies and strategies to support an overall Comprehensive National Development Plan, and is setting up sector specific goals and targets. In this context, there has been a renewed focus on urban issues.

On 27 July 2016, the Government of Myanmar released its National Economic Policy. Of 12 concrete policy steps, one was to “To construct sustainable cities for long-term protection of environment, improvement of public services, creation of public places and increase protection actions for cultural heritage.” The new NLD Government has taken a renewed focus on urban development and housing issues, and developed a wide-ranging and action-oriented plan for its future under the Ministry of Construction. This new approach integrates:

- Provision of housing for low income groups as part of the ‘million houses’ programme
- Poverty reduction in rural and urban areas
- Empowerment of local government and decentralization
- Urban rural linkages and connectivity
- Rural road connections for growth and trade.

The new government has also taken on a renewed focus on environmental issues, launching a number of initiatives aimed at environmental conservation (including suspension of all logging, and stopping brick manufacturing from agricultural soil), as well as looking into environmental

efficiency savings and constructing a new waste-to-energy plant. Human settlements in forest areas are being regularized and monitored, and rural and regional planning under the NLD will have a renewed focus on disaster mitigation.

In addition, the current political transformation is opening up ample opportunities to launch the modernization of urban governance and legislation. The end of political sanctions is opening up new financial opportunities from multilateral and bilateral development banks for physical infrastructure construction and urban development. In light of these new opportunities, Myanmar has been undertaking significant transformative measures in urban development, including the establishment national level strategies and policy frameworks as well as the necessary legal instruments to support their implementation.

1.3 Administrative Topography

Myanmar has a distinct administrative topography which influences the understanding of urban demographics, as well as various processes of urban planning, governance and legislation.

Under the 14 regions and states, the country is further divided into 65 districts, 366 city/towns, 325 townships, and 60 sub-townships. There are 13,729 village tracts and 64,989 villages. Of the 325 townships, 33 are urban, 3 are rural and 289 are mixed⁵.

The term “region” is used for the areas that have a bamar ethnic majority, whereas the term “state” is used for the territorial units predominantly populated by non-bamar ethnic groups. From the constitutional perspective, both states and regions enjoy the same status vis-à-vis the national level government. In addition there is the Union Territory of Nay Pyi Taw, the new capital city of Myanmar, which covers around 7,000 km² with a population of 1.16 million as of 2014⁶. States and regions, as well as the Union Territory of Nay Pyi Taw consist of districts, which in turn are comprised of townships. Townships form the basic element of the municipal administrative topography of Myanmar. A central feature of townships is that they encompass urban areas which are called urban wards, and rural areas called village tracts. Village tracts frequently encompass several villages as spatially distinct settlements. Further spatial administrative categories beyond urban wards and village tracts do not exist.

The classification of an area as urban or rural is carried out by the General Administration Department (GAD) of the Ministry of Home Affairs. Village tracts are generally areas with low population density, and a land use which is predominantly agricultural. Conversely, urban areas have an increased density of building structures and population, and enjoy better infrastructural

^{5 6} Myanmar Population and Housing Census 2014, Provisional Results

services. A township, as an administrative entity, can include several separate towns and likewise, a number of distinct villages.

2. Urban Demographics

2.1 Current Level of Urbanization

In 2014, around 14.9 million of Myanmar's 51.48 million populations lived in urban areas – approximately 29.6% of the population⁷. There are 330 towns and cities in the country, with Yangon and Mandalay accounting for 20% of the urban population and generating a significant proportion of the nation's gross domestic product⁸. Although the proportion of people living in urban areas in Myanmar is still low compared to other countries of the region, the context is evolving rapidly.

The rate of urbanization in Myanmar has increased over the past decades from 24.8 percent of the total population classified as urban in 1983, to 29.6 percent in 2014. Table 2.1 displays a comparison of urbanization rates in the 14 states/regions of Myanmar, between 1983 and 2014.

Table 2.1: Comparison of the percent urban for state/regions, 1983 and 2014 Censuses

State/Region	1983 Percent Urban	2014 Percent Urban
Union	24.8	29.6
Kachin	22.2	36.1
Kayah	26.0	25.3
Kayin	16.6	21.9
Chin	14.7	20.8
Sagaing	13.8	17.1
Tanintharyi	23.7	24.0
Bago	19.5	22.0
Magway	15.2	15.0
Mandalay	26.5	34.4
Mon	28.2	27.9
Rakhine	14.8	16.9
Yangon	68.2	70.1
Shan	21.3	24.0
Ayeyawady	14.9	14.1

⁷ Myanmar Population and Housing Census 2014, Provisional Results

⁸ Myanmar Climate Change Strategy and Action Plans, 2016-2030.

Source: UNFPA Census Thematic Report on Migration and Urbanization, 2016

Yangon Region, whose urban population had reached 70.1 percent in 2014, only exhibited a slight increase in the percent of the population residing in urban areas, although it is noteworthy that the compositions of the labor force in some areas of Yangon which are classified as rural resemble those of urban areas. The largest growth was seen in Kachin and Mandalay, where increases of almost 14 and 8 percentage points occurred respectively. Meanwhile, four states: Kayah, Magway, Mon and Ayeyawady displayed declines in the percentage of population residing in urban areas. This decline was marginal in the cases of the first three states listed, but was more substantial for Ayeyawady. Ayeyawady is a major supplier of migrants to Yangon, which is assumed to be an important contributing factor to the decline in the region's urbanization rate⁹.

Myanmar's second and third highest urban populations by percentage are in Kachin State and Mandalay Region. However, their urban population percentages are significantly less than Yangon, at only 36 and 35 percent respectively. As seen in Figure 3, Rakhine, Magway and Ayeyawady have the lowest levels of urbanization at 17, 15 and 14 percent, respectively.

2.2 Drivers of Urbanization

2.2.1 Growth due to Natural Increase

Natural population growth is a fundamental driver of urbanization. According to the 2014 Housing and Population Census, Myanmar has a low fertility rate of 2.23, representing a significant decline from 4.7 in 1983, despite the absence of any national population policy. This is also low as compared to other Southeast Asian countries of similar economic standing, such as Cambodia at 3.18, and Lao People's Democratic Republic at 4.41¹⁰.

The fertility rate is much pronouncedly lower in urban areas. This is attributed to extreme delays in marriage (almost unparalleled in the region, with the exception of developed countries), the prevalence of illegal abortions, and the high proportion of unmarried women of reproductive age with 25.9% of women aged 30–34, and 33.1% of men and women aged 25–34 single in 2014. These patterns stem from several cultural and economic dynamics, including economic hardship, which results in the delay of marriage and family-building¹¹.

2.2.2 Rural-Urban Migration

Beyond general population growth, however, the growth of urban areas typically involves a mix of socioeconomic push- and pull-factors that drive *rural-urban migration*. One push-factor is that agricultural production is subject to prevailing weather conditions, as well as to market forces. Crop failure due to drought or pest attacks, destruction by storms or floods, and fluctuations in market price for crops due to over-production, competition or lack of access to markets can all

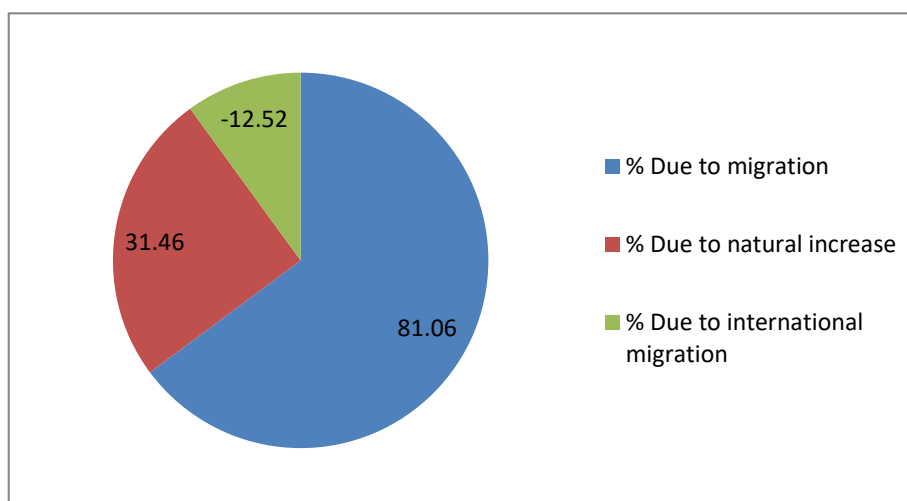
^{9 10 11} UNFPA Census Thematic Report on Migration and Urbanization, 2016

result in dramatically lower incomes for farmers than they had expected. While some of these push-factors can be meliorated by Government programmes such as land reform, farm-to-market road development, or linking farmers to the international food product supply chain with access to international markets, farming remains a high risk activity. Even where the farmers are successful, rural families in Myanmar often choose to invest some of their profits in a better education for their children, in hopes that this will generate extra income when the parents are no longer able to work.

There are also various pull-factors that motivate people to migrate to towns and cities. Although income disparities are more obvious in urban areas, people migrate with the hope that they might achieve financial success. Villagers move to towns and cities as students, having more access to higher education in urban areas. While living space may be more limited and the environmental conditions worse, job opportunities in urban areas also tend to be better, especially for those who have attained a higher level of education. Wider access to services and goods, including better health services, entertainment and consumer goods also attract rural migrants.

The components of population growth in Yangon in the five year period between 2010 and 2014 are displayed in Figure 2.2, demonstrating that internal migration accounted for 81 percent of the growth of the Yangon district, while natural increase was responsible for 31.46 percent. The level of fertility was below replacement at 1.85, but the young age structure coupled with migration resulted in a positive contribution of growth due to natural increase. The impact of migration on the growth of the urban population in Yangon is very high, at 81 percent, and is only offset by the negative contribution of net international migration from Yangon. It is expected that as the fertility rate of Yangon continues to fall, and as the population momentum built into the age structure declines, internal migration will become even more prominently the driver of urban growth.

Figure 2.2: Contribution of the components of urban growth to the change in the population of Yangon between 2010 and 2014



2.2.3 Industrial Demand

The shift of labor force composition due to an increasing demand in the manufacturing sector is also a driver of urbanization. Yangon, which contains 23 industrial zones, has been the most popular destination for internal migration. Of the top 20 inter-district population flows displayed in Table 2.2, all except for one flow includes one of Yangon's four districts as the destination. North Yangon, which has expanded its industrial base over the past decade, is the top destination of the flows appearing 12 times in the top 20. The central business district (CBD) is located in West Yangon, but rents have risen rapidly in recent years forcing many people to leave for the outer areas of the city. East Yangon is less crowded and has lower rents, hence making this district a major beneficiary of this movement¹².

According to UNFPA's analysis of the industry data from the 2014 Census, the labor force in North Yangon contains the highest number of manufacturing sector jobs. This is especially so for female migrants, where almost 50 percent of the labor force is employed in manufacturing. This is followed by East Yangon district, where almost one quarter of females is employed in manufacturing.

There are also industrial zones which have been established outside of Yangon. Mandalay has 4 zones, Ayeyawady has 3, Bago and Magway have 2 each, and Mon, Sagaing, Shan and Tanintharyi have 1 each. Each of these zones are designed specifically to attract local, and in some instances foreign investment. All are attracting workers and are contributing to increased migration.

The one migration flow between districts in the top 20 flows which did not involve Yangon was the movement of 24,500 migrants from Myingyan district to Mandalay district, both of which are located within Mandalay State. Although not adjacent to each other, the flow characterizes movement between poor, primarily rural districts and richer urban areas¹³.

Table 2.2: Top 20 district to district flows for recent migrants

Rank	District to district flow	Size
1	West Yangon to East Yangon	56601
2	Phayapon to North Yangon	51086
3	West Yangon to North Yangon	43044
4	Hinthada to North Yangon	35311
5	Maubin to North Yangon	33369
6	Labutta to North Yangon	29796
7	Thayawady to North Yangon	29362
8	North Yangon to East Yangon	28368

^{12 13} UNFPA Census Thematic Report on Migration and Urbanization, 2016

9	Pathein to North Yangon	27852
10	East Yangon to West Yangon	26257
11	East Yangon to North Yangon	25652
12	Phayapon to East Yangon	24891
13	South Yangon to North Yangon	24660
14	Myingyan to Mandalay	24500
15	Myaungnya to North Yangon	21694
16	Bago to East Yangon	20807
17	North Yangon to West Yangon	17519
18	Bago to North Yangon	18663
19	Magway to North Yangon	16321
20	Pathein to East Yangon	14835

Source: UNFPA Census Thematic Report on Migration and Urbanization, 2016

2.3 Projections of Future Urbanization

As mentioned previously, the percentage of the population residing in urban areas in Myanmar remains at a low level compared to other countries in the region. With 29.6 percent of the population classified as *urban*, the country remains predominately rural and the majority of its labor force agricultural. However as Myanmar develops, much more rapid levels of urbanization and urban growth can be expected.

Projections of urbanization¹⁴ in Myanmar for 2010 in three classes of cities: (1) cities with a population higher than 1 million, (2) cities with a population ranging from 0.3 million to 1 million, and (3) cities with a population of less than 0.3 million people, have yielded the following interpretations:

- By 2030, the total urban population of Myanmar is expected to reach 20.4 million, an increase from 15.2 million in 2014.
- The number of residents living in cities with a population higher than 1 million persons is expected to grow from 5.8 million to 9.2 million, an increase of about 58 percent. This growth is expected to occur in just two city regions, Yangon and Mandalay, with the greater share of additional population growth most probably occurring in Yangon.
- The number of dwellers residing in medium-sized cities is expected to grow from 1.2 to 1.9 million, thus increasing by about 54 percent.
- Despite a low projected average growth rate of 0.79 percent per annum, the number of urban dwellers in the smallest category of cities is also expected to grow from 8.2 million to 9.3 million, an augmentation of about 13 percent.

In summary, the urban population is expected to grow to about 20.4 million in 2030, or 34.7% of the population, driven by general population growth, rural-urban migration, increase in the manufacturing sector and growth of the real GDP progressively aligning with the regional trends

¹⁴ UN-Habitat, 2016. Rapid Urban Diagnostic Report Myanmar.

as the country unlocks its potential after years of stagnation. This represents an absolute increase of 36.9% in urban population by 2030 compared to the 2014 baseline of the Census. Other estimates, however, indicate a faster growth that will see 50% of the population living in cities and towns already in 2040. By all accounts, although the country's urban population percentage is still comparatively low and the growth rate per annum has been similar to that of the population (about 0.84 percent, according to Census 2014), the growth rate of the relative share of people living in agglomerations of 1 million people, i.e. Mandalay and Yangon (and Nay Pyi Taw to an extent) has been comparable to the regional trends at around 2 percent per annum¹⁵, and is expected to accelerate in the coming years with increasing industrial demand due to economic growth.

¹⁵ Myanmar National Climate Change Strategy and Action Plans, 2016-2030

3. Urban Development

As the demographic analysis in Section 2 demonstrates, urbanization in Myanmar is expected to progress rapidly in the context of recent socio-economic and political transformations; with most of the projected urban population growth concentrated in Yangon and Mandalay. Meanwhile, urban spatial expansion in Myanmar was relatively modest in the decade from 2000 to 2010, with an average of only approximately 40m² of urban land expansion took per additional urban resident. In particular in Yangon, the intensity of spatial expansion was low at only 24m² of built-up urban land per additional resident, implying that additional inhabitants were likely more accommodated through increasing densities or occupancies in houses and apartments than through new construction, or that they had to make do with informal settlements which are not accompanied by areas for infrastructure. As such, there is an accelerating need to effectively manage the growth of urban areas to ensure that the negative externalities are minimized. In addition, the country recognizes the need to organize its spatial growth strategies, ensuring all cities and towns assume important strategic value for sustaining socio-economic development, from large cities (Yangon, Nay Pyi Taw and Mandalay), to regional centres (e.g. Patheingyi, Bago) and agro-industry centres (e.g. Lashio, Monywa).

In light of the opportunities provided by democratization and the government reform, Myanmar has been making significant efforts towards rational, integrated spatial planning as well as coordinated sectoral planning to effectively address the needs of the growing urban population. Significant transformations have been seen in the urban development sector since 2012. This includes the formulation of several national-level policies and frameworks in the urban planning and housing sectors, decentralization of planning authority, and establishment of urban planning on the local level after decades' long absence, as well as the development of necessary legal, procedural and governance instruments to support implementation under the new policy frameworks.

3.1 Land and Urban Planning

The sections below provide an overview of Myanmar's various recent accomplishments and planned steps forward towards integrated spatial planning and modernization of urban planning, as well as new establishments in urban planning legislation such as the Urban and Regional Planning Development Law, and Zoning and Heritage Controls being introduced in Yangon for the first time. Outside major cities, the Government of Myanmar is pursuing small-scale settlement planning, particularly focussed on small villages in forest areas and regularizing the villages for habitation under the General Administration Department.

3.1.1 National Level Policies and Frameworks

National Urban Policy

Myanmar is formulating a National Urban Policy (NUP), due to be finalized by the end of 2016, with the purpose of ensuring the development of sustainable cities and well-managed urbanisation in the country. The NUP will help to harness the positive economic, environmental, and social effects of urbanisation, mitigate its negative externalities, and promote an “urban paradigm shift” by providing a coordinated approach and clear policy directions. It will provide the general framework to orient public interventions in urban areas, and be a reference for sectoral ministries and service providers, as well as a key reference for future legislative institutional reform in the urban development sector.

At present, the NUP Framework has been finalized. There are currently plans to complement this with a Spatial Urban and Regional Development Framework, which will assign roles to different urban centers (activity hubs) and consider strategic opportunities to balance urbanization; in other words ensuring that cities and towns other than Yangon and Mandalay also have a role to play in the urbanization process.

National Transportation Master Plan

The transport sector has a key role in fostering Myanmar’s economic growth and advancing social development. Improvements in infrastructure are needed to capitalize on regional trade opportunities, and the coordinated and sustained upgrading of the country’s infrastructure, facilities, and skilled human resources are important in realizing Myanmar’s growth opportunities.

Myanmar is eager to seize on the growth opportunities provided by regional integration, and the scale of growth in the region and the increase of foreign investment possibilities and infrastructure financing are helping in this regard. Myanmar’s strategic location in the ASEAN region, its proximity to Bangladesh, China, India, Laos and Thailand, leave no doubt that Myanmar will play an important role in generating a significant level of regional GDP in the future. However, the possibilities for such growth means that development of the country’s transport sector should be an infrastructure priority, which requires investment in international airports, deep sea ports, inland waterways, strategic rail and highway networks and improvements in cross-border infrastructure and regional connectivity. This will in turn serve to encourage urban-rural interactions and connectivity.

Against this backdrop, the Myanmar National Transport Master Plan was developed to provide guidance for a long-term investment program that will help the Government achieve its economic growth targets by 2030. In addition, this Master Plan provides guidelines that are adaptable to

other industrial sectors and to private investment, to assist with investment planning and decision making for a variety of transport sector projects.

In this way, the Master Plan informs the transport sector's development vision, by presenting a set of comprehensive policies relevant to all modes of transport, as well as development strategies for specific modes like road (and road transport), rail, air, maritime and inland waterways, as well as the associated projects and activities that can help these modes achieve the vision.

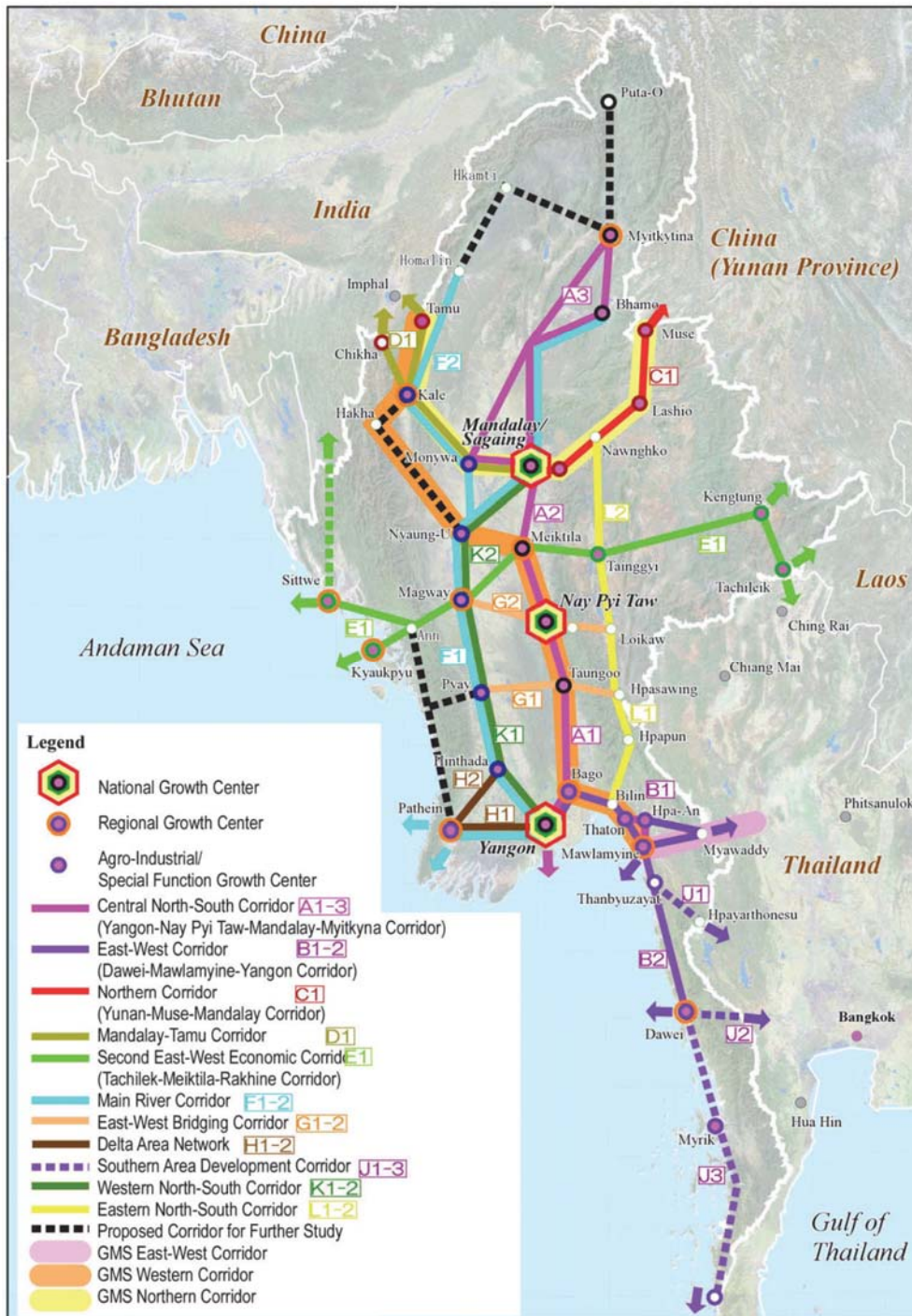
The Master Plan is designed to be read in conjunction with Myanmar's National Comprehensive Development Plan (NCDP), which describes the country's development vision and strategic goals. This transport Master Plan has been prepared with the NCDP in mind and will be updated in conjunction with the achievement of national development objectives, guided by the NCDP.

National Spatial Development Framework

Myanmar is planning to establish a National Urban System Plan representing the principal spatial structure of Myanmar, identifying the network of major cities and the transportation axes that connect them. The draft of the National Spatial Development Framework (NSDF) encompasses a basic version of a National Urban System Plan. The NSDF, whose time horizon extends to 2030, has been embedded into the National Transportation Master Plan, providing a robust general orientation for future nationwide spatial development.

The NSDF proposes a hierarchy of urban centers (activity hubs) based on an analysis of their current functions, current relative weight, and an evaluation of their future potential. Based on this analysis, the Framework develops a hierarchy of urban centers consisting of four tiers: national strategic growth centers (Yangon, Mandalay and Nay Pyi Taw), regional cities, agro-industrial cities and border towns/other special function settlements. Subsequently, the urban centers are connected through a system of transportation axes, which simultaneously serve as spatial corridors for economic development. The network of corridors also takes into account supra-national regional nets such as the Greater Mekong Sub-Region Economic Corridors and the ASEAN highways. Figure 3.1 displays the location of activity hubs, combined with the nationwide transportation grid.

Figure 3.1 NSDF and Development Corridors



Source: The Ministry of Transport of the Republic of the Union of Myanmar, The Survey Program for the National Transport Development Plan in the Republic of the Union of Myanmar, Final Report (Sept. 2014), p. 10-3.

Myanmar National Building Code

The Provisional Myanmar National Building Code is the outcome of a joint endeavor of the Myanmar Engineering Society and UN-Habitat, which yielded a highly comprehensive and exhaustive manuscript. With several sections currently under review, the Building Code is expected to be enacted within 2016. With regard to technical norms and technical requirements for buildings, the document reflects global standards. Despite not having been legally codified, it is already being applied at least for major building projects. The Building Code comprises seven sections:

- 1) Planning, Environment, Administration and Legislation
- 2) Architecture and Urban Design
- 3) Structural Design
- 4) Soil and Foundation
- 5) Building Services
- 6) Building Materials
- 7) Construction Practices and Safety.

A few of the Building Code's provisions are also relevant for spatial planning and urban development. In Section 1, it includes a system of 'use classes' or 'classified use zones', which are employed in many countries both developed and emerging. The system comprises eight primary uses: (1) residential, (2) commercial, (3) industrial, (4) public and social, (5) educational, (6) public and semi-public (government), (7) agricultural and (8) special area/old built-up areas (heritage areas). The primary uses are sub-divided into sub-sections which list further permitted uses in detail. The Building Code directly links the use classes to zoning plans, whose case-specific purposes determine the choice of use classes; and suggests defining the legal scope of zoning plans in a future Urban and Regional Planning Act.

3.1.2 Establishment of Urban Planning

Local-level urban planning

Myanmar is currently undertaking several legal and institutional reforms to redefine the conventional roles of central government agencies, particularly in the delegation of authorities to region and state governments. Moving forward, the role of the regional government may expand to land administration, housing and urban development.

The local governance currently in charge of township administration and development (Town Management Committees), with the notable exception of the main cities, are learning to engage in long-term strategic coordination and planning. However, efforts towards further decentralization are being made to delegate planning authorities to the local level. Formal urban planning on the

township level was established in 2012 after decades' long absence, to prepare concept plans for 82 towns and cities throughout the country. In this light, there are ongoing efforts to recruit and train local level planners at township level in up to 80 towns.

Land Administration Reform

A lack of land ownership records is a challenge towards which Myanmar is taking its first steps to address. Issuing certificates of land ownership, especially in rural and peri-urban areas where much of urban population growth is expected to take place, ensuring that all land measurements are made on a common system and digitizing the data are priorities. A Land Information system (LIS), has been piloted could identify land titles, zoning ordinances affecting the use of the land and the status of any planning permit or development on the land. Currently in rural areas, there has been progress in translating paper maps to electronic.

In January 2016, the Government of Myanmar adopted a new National Land Use Policy. It will be utilized in the coming months as the basis of a new National Land Law to unify the current diverse set of land laws in the country.

Strategic Urban Development Plan for the Greater Yangon Area

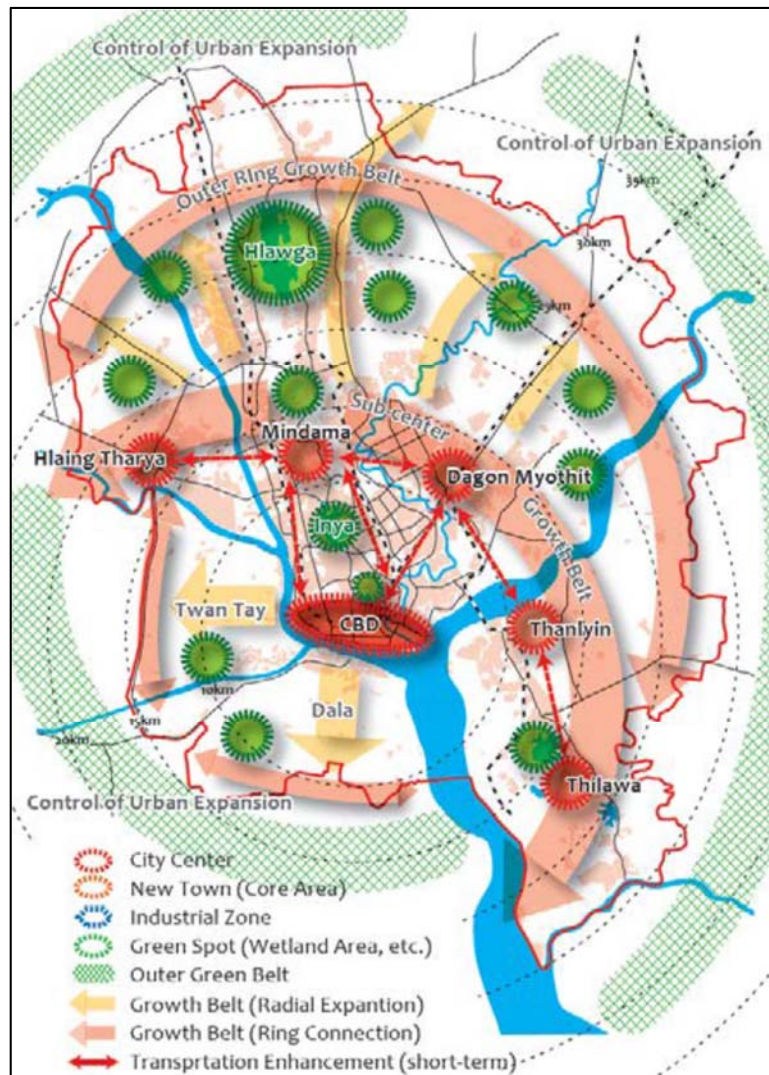
Yangon was seat of the British colonial administration until independence in 1948, and was subsequently the seat of Myanmar's government until 2005. It is the commercial and industrial center as well as the trade hub of Myanmar, with several industrial zones located at its outskirts focusing on textile production. Yangon City consists of 33 townships, of which 28 have an urban population of 100 percent. The census of 2014 tallied a population of approximately 5.2 million for the 33 townships, of which 4.7 million fell into the category urban population.

The Yangon City Development Council (YCDC) area and its adjacent townships had been in urgent need for a comprehensive plan to set out where new development should be located, and how it will be serviced. In 2013-2014 YCDC, in close cooperation with Japan International Cooperation Agency and with the Ministry of Construction's then Department of Human Settlements and Housing Development (now Department of Urban and Housing Development) continuously involved, developed the draft of the "Strategic Urban Development Plan for the Greater Yangon Area" (SUDPGY). In June 2015 the plan was approved by the Parliament of the Yangon Region.

The SUDPGY was developed around the central themes of urban planning in Yangon, which are: developing its public mass transit system, achieving a compact conurbation to reduce aggregate demand for car and motorbike transportation, preserving architectural heritage from both the colonial period and the royal era before, protecting wetlands, lakes and green spaces, and

establishing resilience with regard to the challenges posed by Climate Change. The strategic plan devises a structural concept for a population roughly doubling from 5.2 million in 2014 to 10 million in 2040. Out of a few alternatives which were proposed, YCDC decided to further pursue the concept for future spatial expansion presented in Figure 3.2 below.

Figure 3.2: Alternative for the urban structure of Greater Yangon: Sub-center system with green isles



A central feature of this concept is the future establishment of five major sub-centers, at which future additional settlements both residential and commercial shall be concentrated along a semicircle termed 'Sub-Center Growth Belt', whose radius extends about 15 km from the center of current Central Business District (CBD). In addition, it encompasses an 'Outer Ring Growth Belt', which roughly parallels the inner 'Sub-Center Growth Belt' and runs approx. 25 km to 30

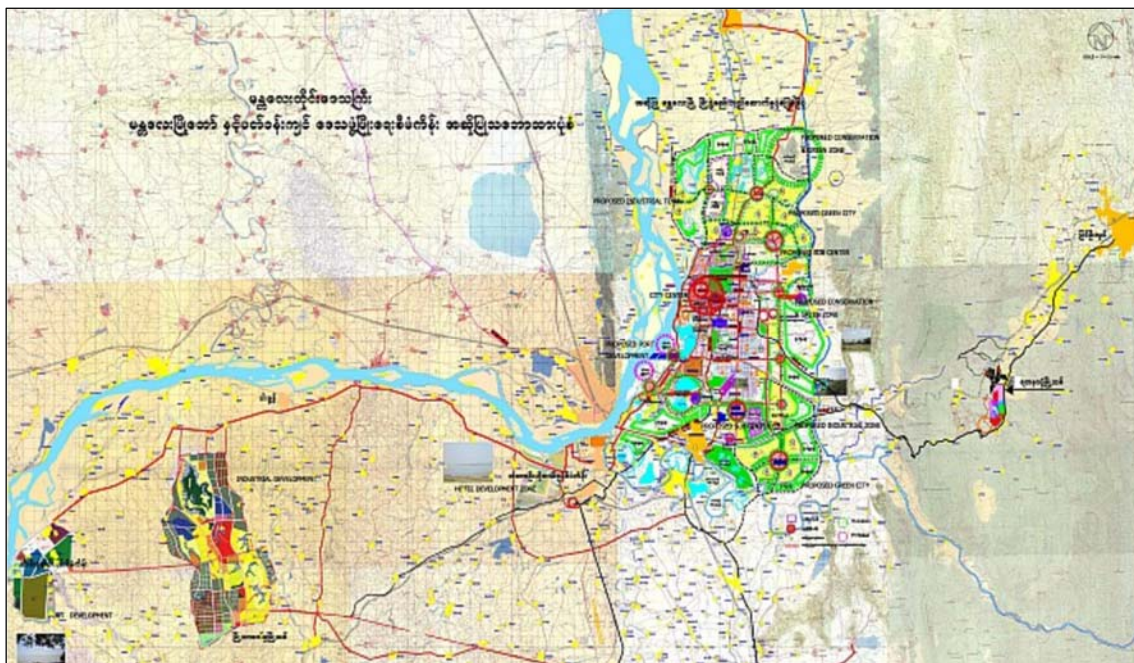
km from CBD. It also includes an outer green belt, whose purpose is to contain and limit outward urban expansion. The purpose of these circular growth belts is to absorb expected additional growth, which would otherwise locate in the existing CBD or along linear shaped growth belts accompanying principal transportation axes.

Mandalay City Development Concept Plan Vision 2040

The former royal capital of Mandalay City is the second largest city of Myanmar, with a total population of 1.73 million according to the census of 2014. Consisting of 7 townships, it is considered to be Myanmar’s cultural capital and is one of its main economic and transportation hubs. In Mandalay, Asian Highway No. 14 from Kunming connects with the GMS Western Economic Corridor, stretching from Yangon to the Indian Border. Thus, Mandalay is situated at a potentially significant land transportation link between India and China.

Like Yangon, Mandalay is governed by a special Mandalay City Development Council (MCDC), which supervises and directs the administrative machinery of the city. Based on an abstract Conceptual Master Plan prepared by the MCDC to steer Mandalay’s urban development from 2012-2014, (then) DHSHD at the Ministry of Construction (MoC) prepared the ‘Mandalay City Development Concept Plan Vision 2040’, illustrated in Figure 3.3.

Figure 3.3: Mandalay City Development Concept Plan Vision 2040



Source: PM Group/Safege/MMIC, *ibid.*, p. 70.

Through a multi-nodal city structure with several new major sub centers, the plan aims to reduce the pressure on the intra-urban street grid system. In addition, the construction of an inner and an outer ring road are intended to reduce cross-town traffic, which creates major issues at present. This strategic plan presents an informative image of the possible future spatial extension of Mandalay.

3.1.3 Urban Planning Legislation

Urban and Regional Development Planning Law

The draft of the Urban and Regional Development Planning Law is currently under preparation. The draft law devises comprehensive work programs for various types of spatial plans, and allocates administrative and political responsibilities for preparation and approval.

The draft law defines the contents and basic tasks of six plan types:

- 1) National Urban System Plan;
- 2) State/Region Urban System Plan;
- 3) Conceptual (Concept) Plan for a city or town;
- 4) Detailed Plans with specified land uses for specific (limited) areas;
- 5) Technical Urban Infrastructure Plans;
- 6) Plans for Special Development Areas.

The National Urban System Plan is the principal spatial structure of Myanmar, representing the network of major cities and the transportation axes that connect them. This structure is augmented by the designation of (major) agricultural and forest areas to be protected long-term. The NSDF encompasses a basic version of a National Urban System Plan, as mentioned in 3.1.1.

State/Region Urban System Plans cover the entire area of a state or a region. Their contents serve to further detail the basic designations of the National Urban System Plan. State/Region Urban System Plans refine national spatial objectives by adapting them to the specific conditions of the respective state/region.

The draft law consigns to Concept Plans the functions which in most other countries are assigned to spatial master plans (scale 1:50,000 to 1:10,000, depending on town size). Concept Plans serve to chart the physical development path for the entire area of a city or town for the next 50 years. The core tasks pertaining to the Concept Plans are:

- 7) To identify area utilizations and their mutual functional relationships including sites for key infrastructure facilities;
- 8) To integrate the infrastructural networks including transportation based on technical urban infrastructure plans;

- 9) To pre-determine main contents of subsequent tiers of urban plans such as detailed plans.

Situated at the lower end of spatial extent, Detailed Plans convey the designations of concept plans to a larger scale (1:500 to 1:5,000). By determining contents of construction permits, detailed plans incorporate the central function of legal regulatory systems for spatial planning worldwide. Subsequent construction permits shall replicate the detailed plans' designations.

3.2 Housing

In the face of rapid urban population growth, one of the major challenges that Myanmar's housing sector has been facing is achieving *inclusive* urban development, in terms of providing adequate access to affordable housing for all. In response to this challenge, the Government has put forth a "million homes plan" - to develop 1 million houses by 2030. The targets for the coming years are to provide affordable housing units (under 10,000 U.S. dollars) for 8,000 households in the next 2 years; and for 26,000 households in the next 5 years. In building the foundation for these ambitious goals, and in support for the Government policy: "To upgrade living standards and provide adequate housing for all the citizens", efforts are underway to establish a National Housing Policy, as well as the legal and financial instruments to support policy implementation.

Simultaneously, institutional changes are taking place to create an enabling environment for the modernization of the housing sector. The 2008 Constitution has assigned the management of the housing sector, including urban development, to the States and the Regions. However, at the policy level, the Department of Urban and Housing Development (DUHD) of the Ministry of Construction plays an important role in building the capacity of regions and states in developing appropriate policies and action responses to housing situations in their regions. In the past, housing activities were seen mainly from the perspective of budget- and time-bound construction projects, which accorded the DUHD the role of a provider and implementer. The DUHD now focuses on (i) creating an enabling environment for planning and housing activities to take place at the town level, (ii) organizing the sector in such a way that diverse actors work in a coherent manner, (iii) introducing policy precepts that accord due importance to housing and urban development both at the local and national levels, and (iv) implementing public projects to meet specific objectives of the government. The Government's current focus is on providing low cost and affordable housing to meet the needs of the urban population.

The sections below provide a description some of the current efforts underway and future plans of the DUHD.

3.2.1 National Housing Policy

With the goal of providing all citizens access to housing they can afford, DUHD is committed to the formulation of a National Housing Policy. Experiences of neighboring countries have demonstrated that an investigative and collaborative process of housing policy formulation, involving various stakeholders is as important as the policy itself, as it results in better coherence in policies and instruments across the sectors. DUHD will look at how it can act as an enabler of privately constructed and developed housing, as well as a provider. Since housing, like urban development, is multi-sectoral and is closely linked with sectors such as land management, water and sanitation, roads, transportation, finance and industry, the National Housing Policy aims to transcend the confine of government-funded public housing construction influence policies of allied sectors in Myanmar, so that the actors involved in the supply can operate efficiently and at an appropriate scale.

To help meet the housing shortfall, the DUHD has recently announced a 1 million house policy, aiming to meet the housing need generated in the coming years.

3.2.2 Housing Finance

Myanmar has been making efforts towards the improvement of the domestic housing finance system. At present, private banks provide loans of up to 70 percent of the total cost for some development projects, still requiring the potential home owner to self-finance the remaining 30 percent. This makes purchasing formal housing from the private sector unaffordable to many households.

As the first step in responding to this issue, a national level Construction and Housing Development Bank (CHDB) has been established and has come into operation since January 2014. As the name suggests, CHDB will operate like a bank and will raise capital from the private sector. Commercial banks will be encouraged to infuse capital in CHDB, and the Government has agreed to buy an equity share of 10 percent. The Ministry is also considering a National Housing Fund to be established with capital surplus of 7.5 million U.S. dollars from the DUHD's existing Housing Revolving Fund, which will finance housing for low income families. Recently the Construction and Housing Development Bank has secured access to finance which will allow it to provide microcredit loans to poor households.

3.2.3 Informal Settlements

Informal settlements have been a feature of Myanmar's cities for several decades. While the national proportion of people living in slum and squatter areas in Myanmar's cities is not yet

known, without quick action this number is likely to grow. A number of factors have led the Government of Myanmar to identify a rapid increase in rates of squatting: these include high rates of rural-urban migration as part of the country's economic transition; recent changes made to land legislation; and the election of a democratic NLD government in late 2015. Particularly since these elections, the Government has witnessed a significant increase in the number of 'professional' and opportunistic squatters, who may be anticipating compensation at a later date. These recent changes are accompanied by a chronic shortage of affordable housing in major cities.

At present, the Government has no comprehensive slum or informal settlement policy. In Yangon, where around 10% of the population is estimated to live in informal settlements, the Yangon Regional Government has recently announced a city-wide plan to address the slum and squatter issue through assessment, resettlement, and enforcement of relevant rules and laws.

Outside major cities, the Government of Myanmar is pursuing small-scale settlement planning, particularly focussed on small villages in forest areas and regularizing the villages for habitation under the General Administration Department.

3.3 Urban Basic Services and Infrastructure

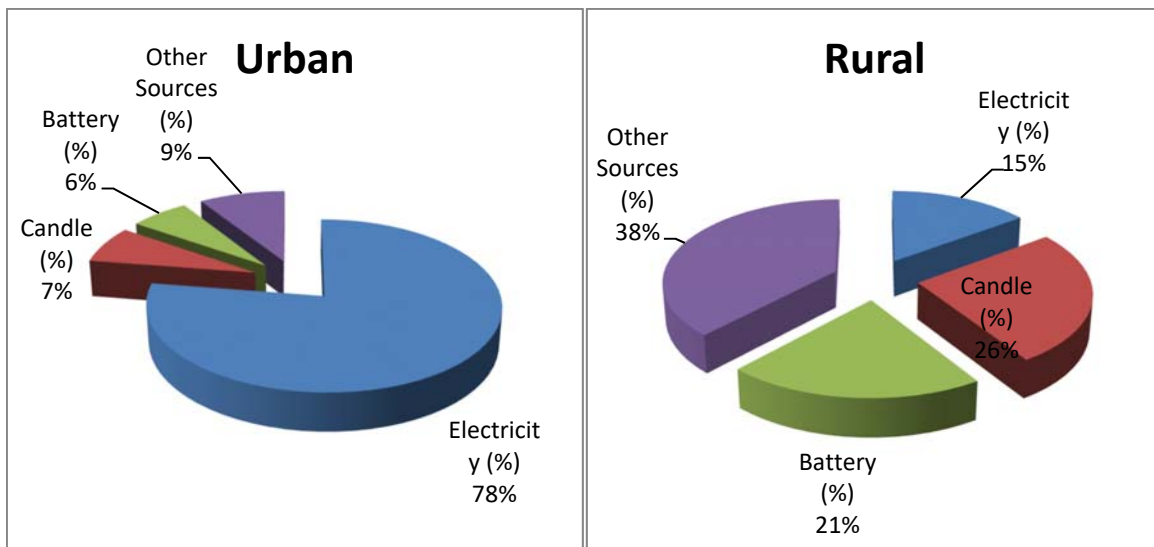
This section provides a snapshot of the current status of access to basic services and infrastructure in urban areas of Myanmar, as well as future plans for improvement in areas such as electricity, water and sanitation, and solid waste management.

3.3.1 Electricity supply

Reliable and steady electricity supply is an absolute precondition for strong and sustained economic, and thus urban, development. Many infrastructural assets such as treatment plants for drinking water, wastewater treatment plants and concomitant pumping and distribution centers require uninterrupted supplies of power for proper functioning. In particular, the development of a manufacturing economy requires a safe and reliable flow of electrical energy. Meanwhile, a substantial augmentation of power output also strongly contributes to the quality of life in both cities and villages, and is hence an important driver of urban development. Once a suburban area is connected to the grid, land values rise, and building as well as population densities tend to increase, subsequently expanding demand for other urban services.

Figure 3.4 below displays the electrification rate in relation to other energy sources in urban and rural areas of Myanmar.

Figure 3.4: Main Source of Energy for Household Lighting (urban/rural)



Source: Myanmar Population and Housing Census 2014, Provisional Results

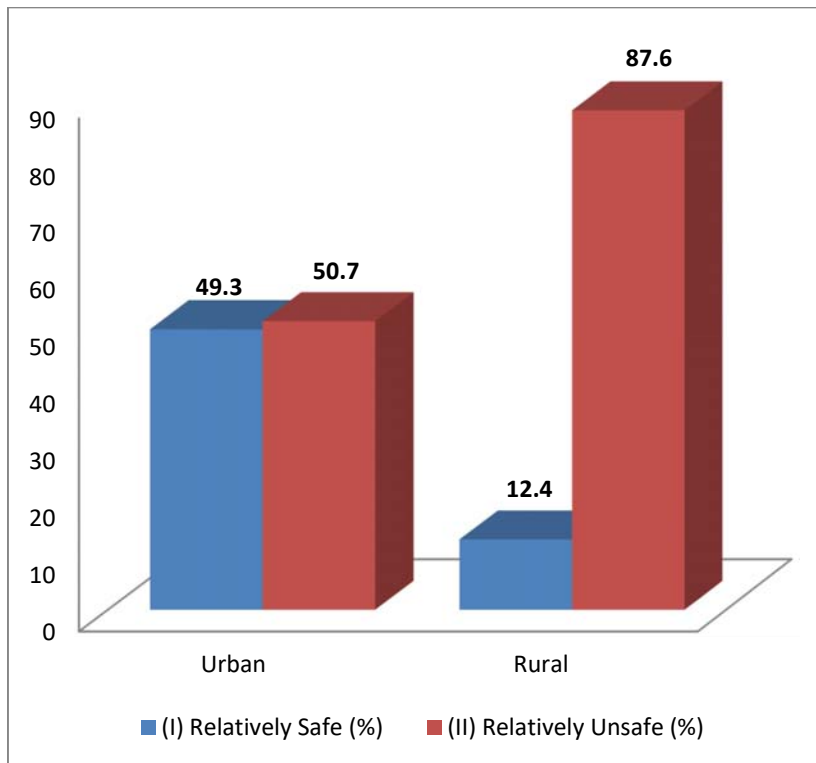
With regard to power grid access, the gaps between urban areas and rural areas are exceptionally wide. Nationwide, 77.5 percent of all households located in urban wards have access to the power grid, whereas this is the case for only about 15 percent of all households inhabiting village tracts. About 87 percent of all households located in the urban areas of Mandalay Region, Yangon Region, Magway Region, and Nay Pyi Taw are currently connected to the power grid.

3.3.2 Access to Safe Drinking Water

The 2014 Census listed a number of sources of drinking water, which were grouped from a public health angle under the categories (I) “relatively safe” and (II) “relatively unsafe” and displayed in Figure 3.5 below.

Category (I) encompasses following sources from the census: tap water/piped water, bottled (purified) water, water from water tanker/water trucks, as well as water harvested from rainfall. Category (II) comprises tube wells/boreholes, protected well/spring, unprotected well/spring, pool/pond/lake, river/stream/canal, plus other sources not further specified.

Figure 3.5: Proportion of households by access to safe drinking water (urban/rural)



Source: Myanmar Population and Housing Census 2014, Provisional Results

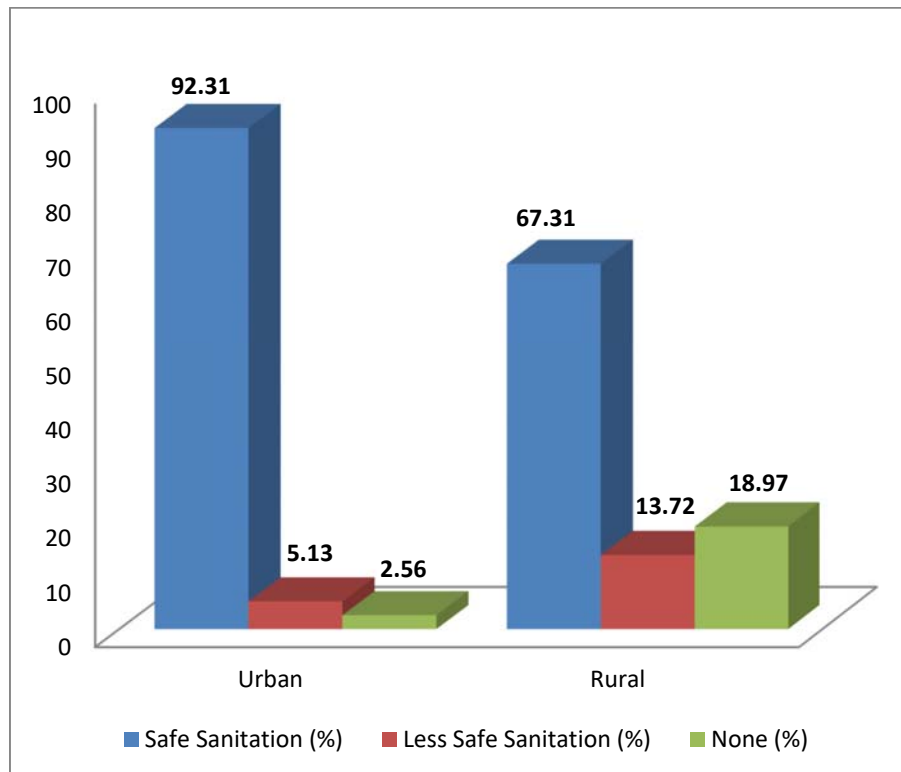
From the aggregate data, it emerges that across all states and regions the share of relatively safe water sources is higher in urban areas than in rural areas. Urban areas usually enjoy a higher share of tap water/piped water and a higher share of bottled water, with the latter arguably reflecting higher aggregate purchase power in urban areas. As can be expected, urban areas in the Yangon Region, Nay Pyi Taw, and Mandalay Region have the highest level of relatively safe water supply, while urban areas in Ayewaddy Region and Bago Region rank at the lower end. Even in the MCDC area (and arguably in the YCDC area as well), a steady supply of piped water is not available 24 hours a day. In the YCDC area, water losses and non-revenue water are estimated to stand at 50 percent of total drinking water produced. Geographical service coverage through the network is limited as well. In Yangon, only 42 percent of the entire population was connected to the piped network in 2010. In the MCDC area, only four out of seven townships are connected to the piped network. Data indicate a significant need to upgrade the quality of drinking water supply nationwide.

3.3.3 Sanitation

Data from the 2014 Census concerning domestic sanitation is displayed in Figure 3.6 below. The census categorizes flush toilets as well as water-sealed (improved) pit latrines as “safe sanitation”,

while traditional pit latrines (pits), surface latrines (buckets), and the classification “other” are grouped together, constituting the “less safe” category. As with potable water, the level of safe domestic sanitation is much higher in urban areas than in rural areas. The category “none” comprises a significant share of 14.4 percent of all households nationwide; however the urban share in this category is only 2.56 percent.

Figure 3.6: Proportion of households by access to safe sanitation (urban/rural)



Source: Myanmar Population and Housing Census 2014, Provisional Results

Households’ wastewater in most cases is discharged into septic tanks directly adjacent to the dwelling unit. The overwhelming majority of both household and industrial wastewater remains untreated and eventually discharged into the rivers or into the sea. Only the CBD area of Yangon has a sewerage network, whose origins date back to the colonial period. A new wastewater treatment plant was opened in Yangon in 2005, prior to which the city’s wastewater was discharged untreated into Yangon River. Mandalay does not have any centralized wastewater system, and only a limited number of households have septic tanks of varying quality. Consequently, a significant quantity of wastewater ends up in the open drainage canals paralleling roads, from where the wastewater is further discharged into lakes and the Ayeyawady River. There is currently an ongoing project in Mandalay which aims to design and construct a piped wastewater network

and a wastewater treatment plant, from which treated water will be discharged into the Ayeyawady River.

3.3.4 Solid waste management

Solid waste management still has much room for improvement in Myanmar. In 2004, about 54 percent of the solid waste generated within the Yangon metropolitan area was collected. Most of this went to landfill sites. Likewise in other cities, municipal development committees have responsibility for solid waste collection and disposal. Solid waste collection rates are estimated to be around 60 percent nationwide, but final disposal is a major challenge and will become more of one as the towns begin to grow¹⁶. The government is exploring a new waste to energy generation plant.

¹⁶ UN-Habitat, 2016. Rapid Urban Diagnostic Report Myanmar.

4. Environment and Urbanization

While climate change poses the greatest threat to Myanmar's cities and current way of life, proper management of its natural resources and maintaining environmental integrity is an important consideration for Myanmar's new government and there is an increasing awareness of environmental protection issues in the country. This is demonstrated by its commitment to suspend all logging and timber production, shortly after taking its seat early in 2016, to undertake a comprehensive review of logging permits, forestry protection, and proper management practices. Similarly there has been a suspension of brick production from soil made from paddy fields, in recognition of the environmental and livelihood impact that this form of brick production has. The government is pursuing a broad green policy and energy savings, and exploring waste to energy generation opportunities.

4.1 Climate Change

4.1.1 Background of Climate Change in Myanmar

Myanmar is inherently exposed to various climate hazards such as cyclones, heavy rain, floods, extreme temperatures, drought that have been increasing in its intensity and frequency over the last sixty years and impacts are being felt. Among the vulnerable regions, coastal zones are particularly at risk from sea-level rise and cyclones, whilst lowlands and central dry-zones are vulnerable to the impacts of floods and droughts, respectively. For instance, an estimated 138,000 people were killed in Cyclone Nargis in 2008, and another 2.4 million people were severely affected by massive destruction to human settlements, infrastructure and livelihoods in the Delta Region. The country is also experiencing decrease in the duration of the south-west monsoon season due to the late onset and early retreat of the monsoon. In the Dry Zone, these changes in precipitation patterns have triggered scarce rainfall and drought, impacting human health and livelihoods, as well as unusually heavy rainfall leading to flooding which causes massive losses in infrastructure and other sectors.

By 2100, climate models predict ever more extreme changes in temperature, drought periods, changing rainfall patterns, increased risk of flooding, cyclones and strong winds, flood/storm surges and sea-level rises affecting almost all sectors and communities. Communities and businesses that are located in at risk regions and reliant on climate sensitive economic activities are particularly vulnerable to the impacts of climate change.

4.1.2 Impacts of Climate Change to Urban Areas

As discussed in the sections above, the context of urbanization in Myanmar is evolving rapidly, underpinned by the expected growth of urban population; the changing roles of various towns and cities in Myanmar as the country organizes its spatial growth strategies and assigns strategic

growth value to different urban growth centres; and the ongoing decentralization process towards a larger role of local governments in long-term strategic coordination and planning, which at present is limited to the three largest cities of Yangon, Mandalay and Nay Pyi Taw. In addition, as the country's economic potential unlocks, the construction sector is expected to boom accompanying a rising demand for both industrial and residential buildings. This sector will have a significant impact on the country's greenhouse gas (GHG) emissions, as well as on the form of new urban developments and their potential for being low-carbon and resilient. This will increase the consumption of energy at urban level.

These four aspects require immediate attention in light of the country's already high vulnerability to the natural hazards, and the projected impacts of changes in climate. Cities will be home to a higher concentration of people and assets, while the pace of infrastructure development and land-use planning face a pressing need to integrate environmental-sensitive measures, and the towns or cities to provide adequate services for all. This increases exposure to hazards in both large and small settlements. Furthermore, as all mid-sized and small towns become home to an increasing number of people, and all play an explicit role in the spatial and economic growth of the country, the vulnerability of these towns' against changes in climate may decrease their capacity to support sustainable and inclusive development and ensure the safety of residents. In particular, as large cities attract more people migrating because of changes in climate that decrease agriculture productivity, this may also result in an increasing informal settlements population, with poor infrastructure and services. Often, informal settlements are located in the most hazardous zones of towns and cities, and the socio-economic vulnerability of their dwellers will be further deepened by the adverse effects of climate change.

Both cities and towns in Myanmar are exposed to recurring rapid on-set natural hazards, such as cyclones and floods. Yangon was badly affected by Cyclone Nargis in 2008, and smaller towns such as Laputta were estimated to have suffered 33,000 casualties and extensive damage. Urban areas that are either in flood-prone areas or in areas experiencing increased water runoff due to the increase in impermeable surfaces will more frequently lose assets and lives to floods resulting from more intense rains. Coastal towns such as Bogalay may have to entirely re-design their form and infrastructure or relocate because of sea-level rise, which is estimated to be between 20 and 41cm by 2050. Water shortages will be an increasing preoccupation, which may result in increase of prices for services in Yangon and Mandalay and, consequently, threaten affordability and incomes.

There are also likely to be serious effects resulting from longer-term, slower-onset changes such as increased temperature and changing rainfall patterns, such as decreased crop yields, which in turn can drive rural-urban migration. Changes in climate observed over the last 20 years in the Dry Zone Area already affected the productivity of crops and resulted in migrations and re-distribution of population from rural to urban areas, or migrations abroad, as confirmed during the local consultations for the strategy, and by Census 2014 itself. The projected climate change scenarios are also likely to affect small and mid-sized towns, for instance Pakokku or Lashio, which depend on agro-business that is largely rain-fed. For instance, they may experience increased food prices

and water-shortages, which, in turn, may impair their role attractiveness for business, work-force and competitiveness and affect their role in the national strategic spatial development plan. Processes of urban growth may also drive land-use change and deforestation, with negative impacts on the commitment to maintain forest coverage to reduce global emissions. Additionally, deforestation can increase the exposure of urban settlements to risks such as landslides; increased run-off of surface water; and heat-island effects. The heat-island effect resulting from increased temperatures and densification of built up areas will result in substantial threats to health and livability.

While Myanmar is at present an insignificant emitter of GHG, urbanization and the construction processes this entails will lead to increased demand of energy, services and resources, which in turn result into increased emissions. Larger and energy-hungry agglomerations will likely contribute more to the total emissions caused by towns and cities in Myanmar. Factors such as the increased access to second-hand car market has significantly increased congestion in the larger cities of Myanmar, whilst the energy demand to operate buildings with insufficient energy efficiency standards will all contribute to considerably re-shape Myanmar's GHG inventory.

4.1.3 Current Policy and Practices

National Level Policies and Practices

Climate change is considered a main area of work by the National Comprehensive Development Plan 2011-2031, as part of the environmental pillar. Myanmar has submitted its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, and has signed the Paris Agreement following the COP21 in December 2015. The INDC has set mitigation targets to help the government of Myanmar adopt low carbon development pathways and meet its international commitment for reducing GHG emissions. A National Adaptation Programme for Action (NAPA) was also formulated in 2013 as a part of Myanmar's commitment to the UNFCCC. NAPA identifies eight priority sectors (agriculture, early warning systems, forests, public health, water resources, the coastal zone, energy and industry, and biodiversity) vulnerable to climate change and requiring urgent and immediate responses.

The Myanmar Climate Change Strategy and Action Plans (MCCSAP) 2016-2030, formulated in in close consultation with national and local level stakeholders representing a cross-section of government institutions, national non-governmental organisations (NGOs), community representatives, private sector actors, development partners, professionals, and academia covering a wide range of sectors, is due to be finalized in 2016. The MCCSAP presents a roadmap to guide Myanmar's strategic responses to address climate related risks and opportunities over the next 15 years and beyond, and aims to support key actors in their decision-making at the national and local levels to respond to the challenges and opportunities associated with climate change. Its overall

strategic vision is “*To develop Myanmar as a nation that is resilient to the impacts of climate change and is able to harness the benefits of low carbon development for present and future generations in an inclusive manner.*” With Cities, Towns and Human Settlements as one of its key sectoral focuses, it aims to build resilience to increased risks of natural rapid and slow on-set disasters for all township and city dwellers, with a focus on the most vulnerable, and develop sustainable and inclusive towns.

Preparations for new Environmental Policy, Climate Change Policy, Green Growth Strategy and National Adaptation Plan (NAP) are underway alongside MCCSAP, which outlines a vision, goal and objectives to guide a transition to a climate resilient and low carbon development pathway that will deliver inclusive economic and social development; and identifies priority actions to build the adaptive capacity of communities and key development sectors, as well as to promote low carbon development.

Climate Change Mainstreaming into Urban Development

Climate Change is also being mainstreamed into sectoral policies and legal instruments that are closely interlinked with urban development. For example, the National Urban and Regional Development Planning Law includes references to environmental and social issues to be integrated into spatial planning. The National Housing Policy will adopt measures to integrate climate change considerations in the delivery of affordable and inclusive housing, and the National Urban Policy will make climate change an important component. Importantly, the Myanmar National Building Code, in addition to measures of safety and disaster-sensible use of materials, construction techniques and technologies, includes specific provisions for energy efficiency and water supply efficiency, and green buildings to contribute in reducing emissions and constructing more liveable and adaptive buildings that reduce needs for energy, cooling and lighting by means of design, technologies and materials.

4.1.4 Future Response to Climate Change

The urbanization process in Myanmar is expected to deliver socio-economic growth and development in line with regional trends, but also entails potential heightened risks. People and assets in cities and towns will suffer from more rapid on-set disasters, and the slow on-set effects of climate change. Certain population groups will be more vulnerable to its impacts, often the poorest and with the lowest capacity to adapt, in particular those living in informal settlements without security of tenure and secure livelihoods. In addition, the process may also imply increased emissions.

Being in the advantageous position of being at comparatively early stages of urbanization, Myanmar has the opportunity to steer the process towards achieving urban resilience. For this reason, there is a need to engage early in the impending process of urbanization to create resilient, sustainable and low-carbon towns and cities, regardless of their size, and over the long-term through all realistic means. According to the MCCAAP, Myanmar aims to integrate concepts of participation, resilience, and adoption of low-carbon technologies into urban planning and development approaches to develop more inclusive, sustainable and resilient towns and cities. Furthermore, Myanmar aims to prevent and mitigate risks by managing urban growth in a way that all urban residents have access to resilient infrastructure, including sanitation, drainage, and secure housing, as well as to take measures towards sustainable transport and compact design.

Participants to the national and local consultations for the formulation of the MCCAAP agreed on that, by 2030, Myanmar should achieve resilient and sustainable cities and towns for all to live and thrive, with emphasis on the most vulnerable people, in alignment with the national policies and SDG11: “Make Cities Inclusive, Safe, Resilient and Sustainable”. This aspiration can be achieved in Myanmar through two main streams of action. Firstly, by reducing the vulnerability that results from the interaction of increased concentrations of people and assets in towns and cities, the sensitivity of the socio-economic and infrastructural urban systems, and the increasing intensity and frequency of climatic hazards; and secondly, by engaging in reducing and preventing new emissions through compact urban development forms, and low-carbon construction technologies.

In this light, Myanmar is currently completing the national Climate Change Capacity Need Assessment and, on this basis, is planning to design the first National Capacity Building Training programme to enable actors to be able and deliver the MCCAAP. Myanmar is also currently working to build capacities to prepare a Vulnerability Assessment to Climate Change for the Country, starting 2016. The process for formulating a National Climate Change Policy, providing an overarching policy direction for the implementation of the INDC, MCCAAP and other relevant sectoral policies and legal frameworks, will also be launched in 2016.

4.2 Disaster Risk Reduction

4.2.1 Disaster Risk Profile of Myanmar

As described, Myanmar is exposed to almost all kinds of natural and man-made hazards, including earthquakes, floods, landslides, cyclones, tsunamis, fire, hail and storms. Myanmar is standing at the crossroad of development and disaster. If development in the country does not account for disaster risk, disaster damages in future can be enormous and all development gains obtained in coming years can be eroded with a single major event like Cyclone Nargis. In recent years, climate extreme events have been aggravated the disaster impact, and this has been observed in cyclones and other disasters happening in alternate years in the past 10-15 years.

Especially urban areas (namely Yangon and Mandalay), being the economic engines of the country, are more exposed to these disasters for potential losses.

With the current changes in the political landscape of Myanmar and rapid economic growth of the country, it is inevitable to stop the unprecedented growth in the urban areas of Myanmar, especially major cities such as Yangon, Mandalay and Nay Pyi Taw. It means over the time more and more people and infrastructure in urban areas will be under increased disaster risk. As discussed, rural urban migration is bound to accelerate, and cities in Myanmar are expected to see exponential growth in urban building construction sector.

A total of 27 natural disasters have been recorded between 1980 and 2010, causing the death of approximately 140,000 people, and affecting the lives and livelihoods of 3.9 million people; an average of 125,000 people a year. By far the most devastating natural disaster in Myanmar's history was Cyclone Nargis. It is estimated that around 870,000 people in Myanmar live in areas that are exposed to cyclones; and a similar proportion are vulnerable to earthquakes, with two fault lines running through the country across some densely populated areas. Furthermore, 440,000 people are vulnerable to flooding and 390,000 are exposed to drought.

Based on another assessment, the UNISDR Global Assessment Report 2015 ranks Myanmar as the highest in terms of average annual loss in relation to social expenditure. The Index for Risk Management (INFORM), which is a collaboration of the Inter-Agency Standing Committee Task Team for Preparedness and Resilience and the European Commission, also measures the risk of humanitarian crises and disasters. The INFORM Results 2015 ranks Myanmar as the 10th highest country among 191 countries. This risk index has been stable for the last three years. When only the hazard and exposure dimensions are considered, Myanmar ranks 5th, and if only natural hazards are considered, Myanmar ranks 3rd highest in the list.

4.2.2 Ongoing Efforts in Urban DRR

Cyclone Nargis proved to be a game changing disaster which not only crippled the country in terms of economic damages and deaths, but also forced policymakers to adopt a new approach for managing the future of such kinds of disasters. This event brings a paradigm shift from disaster response to disaster prevention/ mitigation and preparedness.

In the aftermath of Cyclone Nargis, major efforts have been put towards institutional strengthening in DRR and Myanmar becoming signatory to the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), which came into force in 2009. Since then, Myanmar has shown steady commitment for DRR with endorsement of MAPDRR in 2012, the Disaster Management Law in 2013, and also realizing the need to enhance capacities related to disaster management in the country through the Disaster Management Training Center (DMTC) in Hinthada. Some key institutional and legal instruments established in Myanmar are:

Myanmar Action Plan for Disaster Risk Reduction (2012)

MAPDRR translates Myanmar's commitment on the Hyogo Framework for Action (HFA) and the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) into action.

The government of Myanmar developed the Myanmar Action Plan for Disaster Risk Reduction (MAPDRR) during 2008 to 2010. The process was led by Relief and Resettlement Department, Ministry of Social Welfare, Relief and Resettlement, Government of Myanmar. MAPDRR has been endorsed by the Government in June 2012. It aimed at 'making Myanmar safer and more resilient against natural hazards, thus protecting lives, livelihoods and development gains'. MAPDRR proposes 65 projects under seven components, which align with the five Hyogo Framework for Action (HFA) priorities and with the ASEAN Agreement on Disaster Management and Emergency Response (AADMER). These 7 components also focus reducing the vulnerability and disaster risk in the urban areas. Under activity "Urban Earthquake Vulnerability and Risk Assessment", Government of Myanmar carried out earthquake hazard and risk assessment of 5 cities lying on Sagaing fault to start prepare action plan so that damages can be minimized.

The disaster management context as well as development pathway have become different from the last 7-8 years when MAPDRR was being developed. At the global level, the Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted by UN Member States on 18 March 2015 at the Third United Nations World Conference on Disaster Risk Reduction. The Sendai Framework is the first major agreement of the Post-2015 development agenda, with seven targets and four priorities for action.

RRD took initiative to start reviewing the MAPDRR in line with the revised regional and global DRR framework such as AADMER (2016-2020), Sendai framework (2015), World Humanitarian Summit (2016), COP 21 and also upcoming Habitat III. To initiate this, RRD in collaboration with DRR Working group of Myanmar held the first consultation workshop "Towards a Safe and Resilient Myanmar". Processes are further going on to complete it by end of 2016.

Changing concept designs for townships

In light of the ongoing threat to Myanmar cities, and with support from international agencies, DUHD has been revising its concept plans for cities and towns to account for risk from natural disasters, including flooding and earthquake. These plans will help to make future Myanmar cities safe, resilient, and durable.

Myanmar Environmental Conservation Law (2012)

Myanmar Environmental Conservation Law was enacted on 30 July 2013. It covers formation of Environmental Conservation Committee, Duties and Responsibilities of the Ministry, establishment of Environmental Management Fund, stipulation of Environmental Quality Standards, Environmental Conservation and management of Urban Environment, conservations of Natural Resources and Cultural Heritage.

Myanmar Disaster Management Law (2013)

Myanmar Disaster Management Law was enacted in July 2013. The Law includes the provisions for formation of disaster management bodies and their duties and responsibilities for all phases of disaster, establishment of disaster management fund at national and Region/State level. The Law also provides the guidance to carry out the measures of disaster risk reduction along with the development plans in the country. The rules for implementation of Myanmar Disaster Management Law has been also drafted by the Ministry of Social Welfare, Relief and Resettlement in consultation with disaster risk reduction experts and Myanmar Disaster Risk Reduction Working Group composed of (56) international and national organizations, led by UNDP.

Disaster Management Training Centre (DMTC, 2015)

The government approved establishment of the Disaster Management Training Centre (DMTC) in order to build up the capacity of people implementing disaster management activities. The DMTC will build upon the existing pool of experts within the Relief and Resettlement Department which has supported capacity development of officials from Government Departments and Social Organizations, since 1977.

DMTC is located in Hinthada Township in Ayeyarwaddy Region. The Ministry is collaborating with international and local partners to mobilize the technical and financial resources for:

- Human resource and institutional capacity development
- Infrastructure development
- Development of Curriculum and procurement of Teaching Aids
- Networking and partnership with International and Regional Training Institutes and Centers

Through the Disaster Management Training Center, RRD has planned to achieve the following objectives;

- To upgrade the capacity of people who implement Disaster Management activities
- To bring awareness about Disaster Management
- To produce Disaster Management Experts

- To conduct multiplier trainings
- To be able to do Disaster Management Research
- To upgrade as International Disaster Management Institute in future

Myanmar National Building Code (MNBC, 2016)

Construction sector is expected to see the exponential growth in the construction sector especially in the urban areas. In the absence of enforcement of building codes and building bye laws, cities in Myanmar can also have huge unsafe concrete jungle like many other south Asian cities. Ministry of construction started working on first National Building Code of Myanmar after 2010. Provisional MNBC was endorsed by government in 2014. Multiple stakeholders consultations were done in order get it updated as per other international standards and comments obtained. Latest version of MNBC was released in March 2016.

Now government is in the process of legalizing the MNBC to enforce it effectively across the country at local level. In this direction, first consultation workshop on MNBC legalization framework was organized in Nay Pyi Taw in July 2016.